2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action and alternatives to this action. The Proposed Action is to hold a competitive lease sale and issue a lease for the federal coal lands in the North Jacobs Ranch LBA[1] Tract as applied for by JRCC. Under this alternative, it is assumed that the tract would be developed as a maintenance tract for an existing mine. The No Action Alternative (Alternative 1) is to reject the North Jacobs Ranch lease application. Under this alternative, the North Jacobs Ranch LBA Tract would not be offered for sale at this time. Other alternatives considered include:

- holding a competitive lease sale and issuing a lease for federal coal lands included in the North Jacobs Ranch LBA Tract as modified by the BLM, with the assumption that it would be developed as a maintenance tract for an existing mine (Alternatives 2 and 3 evaluate two alternate tract configurations considered by BLM);

- holding a competitive lease sale and issuing a lease for federal coal lands included in the North Jacobs Ranch LBA Tract (as applied for or as modified by BLM), with the assumption that it would be developed as a new mine (Alternative 4);

- holding a competitive lease sale and issuing a lease for the federal coal lands in an expanded tract configured to include the North Jacobs Ranch LBA Tract and all of the proposed State Section LBA Tract, with the assumption that the expanded tract could be developed as either a maintenance tract or as a new mine (Alternative 5); and

- delaying the sale of the North Jacobs Ranch LBA Tract as applied for to take advantage of higher coal prices and/or to allow recovery of the potential CBM resources in the tract prior to mining (Alternative 6). Under this alternative, it is assumed that the tract could be developed as a maintenance tract or a new start mine, depending on how long the sale was delayed

The North Jacobs Ranch LBA Tract as applied for (Proposed Action) and as it might be amended by BLM (Alternatives 2 and 3) are shown in Figure 2-1.

LBA tracts are nominated for leasing by companies with an interest in acquiring them, but as discussed in Chapter 1, the LBA process is, by law and regulation, an open, public, competitive sealed-bid process. If the decision reached after this EIS is

[1] Refer to page viii for a list of abbreviations and acronyms used in this document.

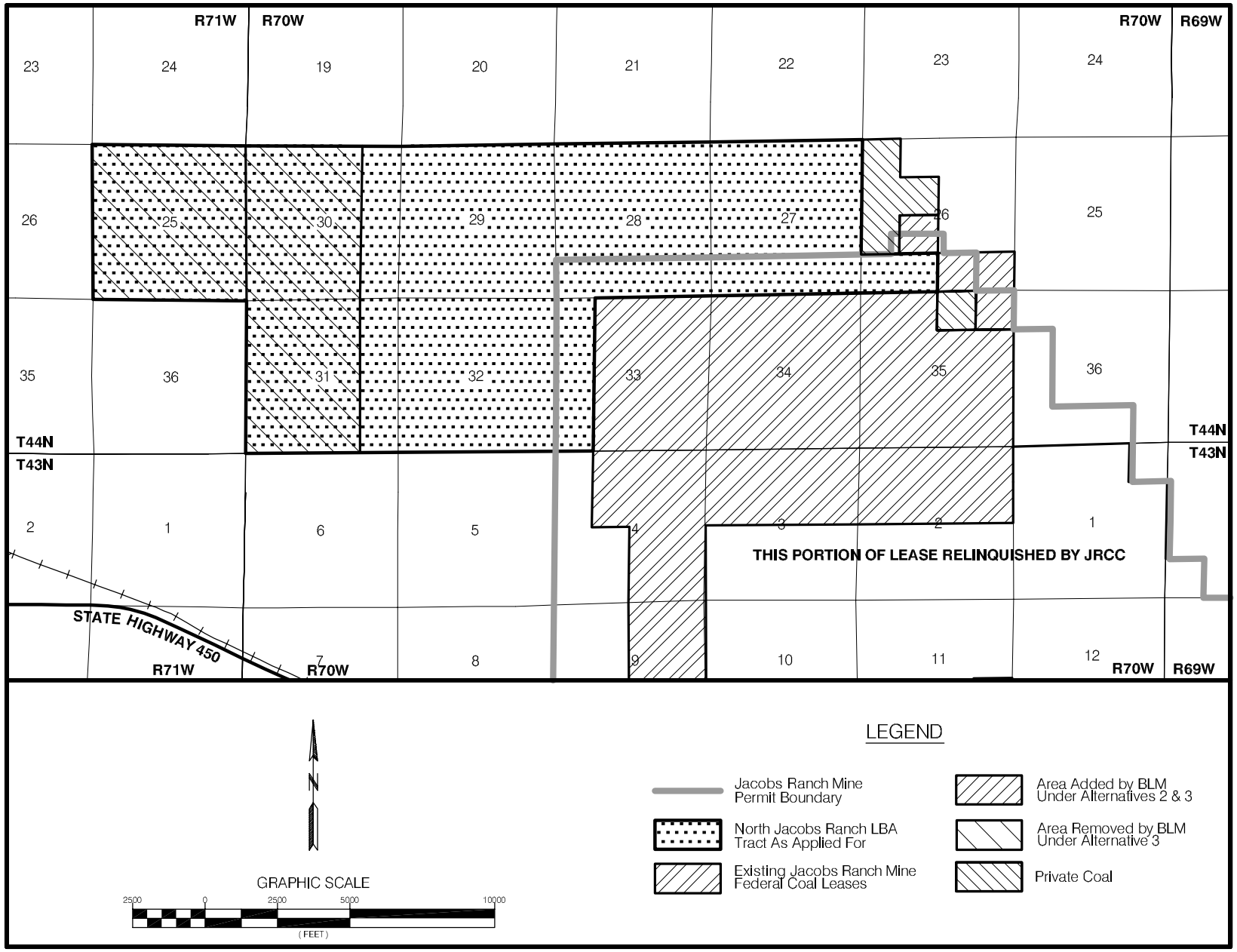

Figure 2-1. North Jacobs Ranch LBA Tract Configurations.

completed is to hold a lease sale, the applicant (JRCC) may or may not be the high bidder. The Proposed Action and Alternatives 2 and 3 considered in this EIS assume that JRCC would be the successful bidder if a competitive sale is held, and that the North Jacobs Ranch LBA Tract would be mined as a maintenance tract for the permitted Jacobs Ranch Mine. Alternative 4 assumes that JRCC would not be the successful bidder if a competitive sale is held, and that the North Jacobs Ranch LBA Tract would be developed as a new mine. Alternatives 5 and 6 assume that the tract could be developed as either a maintenance tract for an existing mine or as a new start mine.

The North Jacobs Ranch LBA Tract is also located adjacent to the Black Thunder Mine, operated by TBCC, a subsidiary of Arch Coal, Inc. TBCC is also in a position to mine the North Jacobs Ranch LBA Tract as a maintenance lease. If TBCC acquires the tract, the rate of coal production, mining sequence, equipment, and facilities would be different than if JRCC acquired the tract as a maintenance lease. However, if TBCC mined the tract, the area of disturbance and the impacts of removing the coal would not be significantly different from the area of disturbance and the impacts of JRCC mining the tract.

If a decision is made to hold a competitive lease sale and there is a successful bidder, a detailed mining and reclamation plan must be developed by the successful bidder and approved before mining can begin on the tract. As part of the approval process, the mining and reclamation plan would undergo detailed review by state and federal agencies. This plan could potentially differ from the plan used to analyze the impacts of the Proposed Action and Alternatives 2 and 3 in this EIS, but the differences would not be expected to significantly change the impacts described here. These differences would typically be related to the details of mining and reclaiming the tract but major factors like tons of coal mined, yards of overburden removed, acres disturbed, etc. would not be significantly different from the plan used in this analysis.

BLM and the State of Wyoming have approved applications to drill CBM wells on oil and gas leases inside the North Jacobs Ranch LBA Tract. This approach is consistent with BLM's recently issued policy on conflicts between coal and CBM development, which is explained in BLM Instruction Memorandum No. 2000-081. BLM's policy is to optimize the recovery of both resources and ensure that the public receives a reasonable return. See Section 3.11 for information about existing and proposed CBM development under the different alternatives.

2.1 Proposed Action

Under the Proposed Action, the North Jacobs Ranch LBA Tract, as applied for by JRCC, would be offered for lease at a competitive sale, subject to standard and special lease stipulations developed for the PRB

(Appendix D). The boundaries of the tract would be consistent with the tract configurations proposed in the North Jacobs Ranch LBA Tract lease application (see Figure 2-1). The Proposed Action assumes that JRCC will be the successful bidder on the North Jacobs Ranch LBA Tract if it is offered for sale.

The legal description of the proposed North Jacobs Ranch LBA Tract coal lease lands as applied for by JRCC under the Proposed Action is as follows:

T.44N., R.70W., 6th P.M., Campbell County, Wyoming

Section 26: Lots 9 and 10; 80.38 acres
Section 27: Lots 1 through 16; 651.34 acres
Section 28: Lots 1 through 16; 655.23 acres
Section 29: Lots 1 through 16; 650.51 acres
Section 30: Lots 5 and 20; 652.74 acres
Section 31: Lots 5 through 20; 647.85 acres
Section 32: Lots 1 through 16; 669.97 acres
Section 33: Lots 4, 5, 12, 13; 161.19 acres

T.44N., R.71W., 6th P.M., Campbell County, Wyoming

Section 25: Lots 1 through 16; 651.98 acres

Total surface area applied for: 4,821.19 acres

Land descriptions and acreage are based on the BLM Status of Public Domain Land and Mineral Title approved Coal Plat as of March 7, 2000.

As indicated in Chapter 1, Section 1.4, no lands in the North Jacobs Ranch LBA Tract were found to be unsuitable for mining. The tract as applied for includes approximately 4,821.19 mineable acres. JRCC estimates that it includes approximately 533 million tons of in-place coal, and that about 479.7 million tons of that coal would be recoverable assuming a recovery factor of 90 percent. BLM will independently evaluate the volume and average quality of the coal resources included in the tract as part of the fair market value determination process. BLM's estimate of the mineable reserves and average quality of the coal included in the tract will be published in the sale notice if the tract is offered for sale. Some coal quality information in the area of the North Jacobs Ranch LBA Tract is included in Section 3.3 of this document. The approved Jacobs Ranch Mine Permit 271 Term T4 includes monitoring and mitigation measures for the Jacobs Ranch Mine that are required by SMCRA and Wyoming State Law. If the North Jacobs Ranch LBA Tract is acquired by JRCC, these monitoring and mitigation measures would be extended to cover operations on the LBA tract when the coal mining permit is revised to include the tract. This permit would have to be approved before mining operations could take place on the tract. These

monitoring and mitigation measures are considered to be part of the Proposed Action and other action alternatives during the leasing process because they are regulatory requirements.

The North Jacobs Ranch LBA Tract would be mined as an integral part of the Jacobs Ranch Mine under the Proposed Action. The Jacobs Ranch Mine is already operating under both an approved state mining permit and an MLA mining plan. Both the existing approved state mining permit and MLA mining plan would require amendment to include the LBA tract. Since the North Jacobs Ranch LBA Tract would be an extension of the existing Jacobs Ranch Mine, the facilities and infrastructure would be the same as those identified in the WDEQ/LQD Mine Permit 271 Term T4 approved August 31, 1999 for the Jacobs Ranch Mine and the BLM Resource Recovery and Protection Plan approved March 31, 1999 for the Jacobs Ranch Mine.

JRCC's currently approved air quality permit from the WDEQ/AQD allows up to 38 million tons of coal per year to be mined through year 2001, and up to 50 million tons per year in 2002 through 2004. In 1999, the Jacobs Ranch Mine produced 29.1 million tons (Wyoming State Inspector of Mines 2000). In 2000, the mine produced approximately 28.3 million tons (Gillette News Record, January 7, 2001). Under the No Action Alternative, the Jacobs Ranch Mine would mine its remaining 190.8 million tons of in-place leased coal reserves in approximately 7 years at an average annual production rate of 24.5 million tons per year. Under the Proposed Action, JRCC currently estimates that average annual production would be 21 million tons per year, and the life of the existing mine would be extended by approximately 23 years.

If JRCC acquires the North Jacobs Ranch LBA Tract as applied for, they estimate that a total of 651.7 million tons of coal would be mined after January 1, 2001, with an estimated 479.7 million tons coming from the LBA tract. This estimate of recoverable reserves assumes that about ten percent of the coal would be lost under normal mining practices, based on historical recovery factors at the Jacobs Ranch Mine. As of December 31, 2000, 381.5 million tons of coal had been mined from within the current permitted area of the mine.

Topsoil removal with heavy equipment would proceed ahead of overburden removal. Whenever possible, direct haulage to a reclamation area would be done, but due to scheduling, some topsoil would be temporarily stockpiled. As required by the reclamation plan, heavy equipment again will be used to haul and distribute the stockpiled topsoil.

The Jacobs Ranch Mine is one of several coal mines currently operating in the PRB where the coal seams are notably thick and the overburden is relatively thin. The truck-shovel mining method has to date been the sole means of overburden stripping

and coal mining at the Jacobs Ranch Mine. The overburden is excavated and loaded into trucks by electric-powered shovels. Overburden would be removed within the North Jacobs Ranch LBA Tract by dragline and/or truck-shovel operations. Most overburden and all coal would be drilled and blasted to facilitate efficient excavation. As overburden is removed, most would be directly placed into areas where coal has already been removed. Elevations consistent with an approved PMT plan will be established as quickly as possible. Under certain conditions, the PMT may not be immediately achievable. This would occur when there is an excess of material which may require temporary stockpiling; when there is insufficient material available from current overburden removal operations; or when future mining could redisturb an area already mined.

Coal would be produced from three coal seams, the Upper, Middle and Lower Wyodak, at several working faces to enable blending of the coal to meet customer quality requirements, to comply with BLM lease requirements for maximum economic recovery of the coal resource, and to optimize coal removal efficiency with available equipment. There are three existing crushing facilities within the Jacobs Ranch Mine permit area that provide the capacity to produce the permitted level. The three facilities employ one-stage crushing to size the coal to a nominal 2-inch product. There are a total of seven storage silos. While sufficient capacity exists, future facilities may be constructed to improve operating efficiency and air quality protection. JRCC has an approved air quality permit from the WDEQ/AQD which allows production of 38 million tons of coal per year through 2001, and 50 million tons per year in 2002 through 2004.

Current employment at the Jacobs Ranch Mine is 333. If the LBA tract is acquired, JRCC anticipates that production would be 21 million tons per year, and employment would be 333 persons.

Hazardous and Solid Waste

Solid waste which is produced at the existing Jacobs Ranch Mine consists of floor sweepings, shop rags, lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. Jacobs Ranch Mine disposes of its solid wastes within its permit boundary in accordance with WDEQ-approved solid waste disposal plans. Sewage is handled by WDEQ-permitted sewage systems present on the existing mine facilities. Maintenance and lubrication of most of the equipment takes place at existing shop facilities at the Jacobs Ranch Mine.

Major lubrication, oil changes, etc., of most equipment are performed inside the service building lube bays, where waste oil is currently contained and deposited in storage tanks. All of the collected waste oils are then disposed of by mixing them with fuel oil and ammonium nitrate to produce ANFO, the principle blasting agent used at the Jacobs Ranch Mine. These

practices would not change if JRCC acquires the North Jacobs Ranch LBA Tract.

JRCC has reviewed the EPA's *Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Re-authorization Act* (SARA) *of 1986* (as amended) and EPA's *List of Extremely Hazardous Substances* as defined in 40 CFR 355 (as amended) for hazardous substances used at the Jacobs Ranch Mine. JRCC maintains files containing Material Safety Data Sheets for all chemicals, compounds and/or substances which are or would be used during the course of mining.

JRCC is responsible for ensuring that all production, use, storage, transport, and disposal of hazardous and extremely hazardous materials as a result of mining are in accordance with all applicable existing or hereafter promulgated federal, state, and local government rules, regulations, and guidelines. All mining activities involving the production, use, and/or disposal of hazardous or extremely hazardous materials are and would continue to be conducted so as to minimize potential environmental impacts.

JRCC must comply with emergency reporting requirements for releases of hazardous materials. Any release of hazardous or extremely hazardous substances in excess of the reportable quantity, as established in 40 CFR 117, is reported as required by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), as amended. The materials for which such notification must be given are the extremely hazardous substances listed in Section 302 of the *Emergency Planning and Community Right to Know Act* and the hazardous substances designated under Section 102 of CERCLA, as amended. If a reportable quantity of a hazardous or extremely hazardous substance is released, immediate notice must be given to the WDEQ Solid and Hazardous Waste Division and all other appropriate federal and state agencies.

Each mining company is expected to prepare and implement several plans and/or policies to ensure environmental protection from hazardous and extremely hazardous materials. These plans/policies include:

- Spill Prevention Control and Countermeasure Plans;
- Spill Response Plans;
- Inventories of Hazardous Chemical Categories Pursuant to Section 312 of SARA, as Amended; and
- Emergency Response Plans.

All mining operations are also required to be in compliance with regulations promulgated under the Resource Conservation and Recovery Act, Federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, Toxic Substances Control Act, Mine Safety and Health Act, and

the Federal Clean Air Act. In addition, mining operations must comply with all attendant state rules and regulations relating to hazardous material reporting, transportation, management, and disposal.

Compliance with these rules is the current practice at Jacobs Ranch Mine. Acquisition of the North Jacobs Ranch LBA Tract by JRCC would not change these current practices nor the amount or type of any wastes generated or disposed at the mine, although quantities of some wastes would increase in proportion to anticipated increases in coal production (e.g., fuel, lubricants, and shop and office wastes).

2.2 Alternative 1

Alternative 1 is the No-Action Alternative. Under the No-Action Alternative, JRCC's coal lease application would be rejected, the North Jacobs Ranch LBA Tract would not be offered for competitive sale, and the coal contained within the tract would not be mined. Rejection of the application would not affect permitted mining activities on existing leases at the adjacent Jacobs Ranch and Black Thunder Mines. Approximately 6,955 acres are currently leased at the Jacobs Ranch Mine and about 8,122 acres will eventually be affected. Under the No-Action Alternative, JRCC estimates that average annual production at the Jacobs Ranch Mine after 2000 will be 24.5 mmtpy, and average employment will be 333 persons. Approved mining activities and employment will also continue at the Black Thunder Mine. Portions of the surface of the LBA tract would probably be disturbed due to overstripping to allow coal to be removed from existing, contiguous leases at both the Black Thunder and Jacobs Ranch Mines.

In order to compare the economic and environmental consequences of mining these lands versus not mining them, this EIS analysis was prepared under the assumption that the North Jacobs Ranch LBA Tract would not be mined in the foreseeable future if the No-Action Alternative is selected. However, selection of this alternative would not preclude leasing and mining of this tract in the future, as either a maintenance tract for an existing operation or as a new start mine.

2.3 Alternative 2

BLM is considering an alternate tract configuration for the North Jacobs Ranch LBA Tract in order to minimize the risk of bypassing federal coal that would potentially become economically unrecoverable if it is not included in this tract. As part of the preliminary geologic analysis of the federal coal resources in and around the North Jacobs Ranch LBA Tract, the BLM identified unleased federal coal east of the tract as applied for that will be isolated and might be bypassed if it is not included in the tract. The lands that BLM is considering adding to the tract are:

T.44N., R.70W., 6th P.M., Campbell County, Wyoming

Section 26: Lots 8, 11 and 12; 120.69 acres
Section 35: Lot 1 40.36 acres

Total: 161.05 acres

These 161.05 acres contain approximately 4 million tons of mineable coal. The Alternative 2 reconfiguration, therefore, results in a tract comprising 4,982.24 acres containing approximately 537 million tons of in-place coal, according to information provided by the applicant. Using JRCC's projected recovery factor of 90 percent, the reconfigured tract would contain about 483.3 million tons of recoverable coal.

The 161.05 acres included in this alternative contain areas that lie within the proposed right-of-way for the proposed DM&E railroad. If the DM&E project is constructed as proposed, mining of these lands would potentially be precluded, and the coal could not be recovered.

Alternative 2 is the preferred alternative of the BLM. Under Alternative 2, it is assumed that the tract would be developed as a maintenance tract for an existing mine. Other assumptions would be the same as for the Proposed Action.

2.4 Alternative 3

Under Alternative 3, the BLM would hold a competitive lease sale for federal coal lands in a tract configured by BLM to minimize conflicts with existing and proposed oil and gas wells, minimize the risk of bypassing federal coal that would potentially become economically unrecoverable, and potentially enhance the fair market value of the coal included in the reconfigured tract as well as the unleased federal coal outside of the reconfigured tract. Based on a preliminary consideration of conventional oil and gas and CBM potential and potential fair market value considerations, this alternative tract configuration would include the following lands:

T.44N., R.70W., 6th P.M., Campbell County, Wyoming

Section 26: Lots 8 through 12; 201.07 acres
Section 27: Lots 1 through 16; 651.34 acres
Section 28: Lots 1 through 16; 655.23 acres
Section 29: Lots 1 through 16; 650.51acres
Section 30: Lots 5, 12, 13, 20; 166.06 acres
Section 31: Lots 5, 12, 13, 20; 166.85 acres
Section 32: Lots 1 through 16; 669.97 acres
Section 33: Lots 4, 5, 12, 13; 162.19 acres
Section 35: Lot 1; 40.36 acres

Total: 3,363.58 acres

The following lands included in the Proposed Action and Alternative 2 would not be included in Alternative 3:

T.44N., R.70W.
Section 30: Lots 6 through 11, and 14 through 19; 486.68 acres

Section 31: Lots 6 through 11, and 14 through 19;
481.00 acres

T.44N., R.71W.
Section 25: Lots 1 through 16;
651.98 acres

Total: 1,619.66 acres

The original configuration of the North Jacobs Ranch LBA Tract as applied for in the Proposed Action would be further reconfigured by adding the adjacent 161.05 acres of unleased federal coal in Sections 26 and 35, T.44N., R.70W. (as described in Section 2.3). As indicated above, the 161.05 acres included in this alternative contain areas that lie within the proposed right-of-way for the proposed DM&E railroad.

The Alternative 3 reconfiguration results in a tract comprising 3,363.58 acres containing approximately 326 million tons of in-place coal according to the information provided by the applicant. Using JRCC's projected recovery factor of 90 percent, the reconfigured tract would contain about 293.4 million tons of recoverable coal. The net decrease to the North Jacobs Ranch LBA Tract as applied for would be 1,458.61 acres containing approximately 207 million tons of in-place coal.

The portion of the tract as applied for that is not included in the Alternative 3 configuration would be available for consideration for leasing in the future. At a later date, the conflicts would potentially be reduced by allowing increased time for the recovery of the CBM and conventional oil and gas resources prior to mining.

Under Alternative 3, it is assumed that the tract would be developed as a maintenance tract for an existing mine. Other assumptions would also be the same as for the Proposed Action.

2.5 Alternatives Considered but Not Analyzed in Detail

2.5.1 Alternative 4

Under this alternative, as under the Proposed Action and Alternatives 2 and 3, the BLM would hold a competitive, sealed-bid sale for the lands included in the North Jacobs Ranch LBA Tract. Alternative 4 assumes, however, that the successful qualified bidder would be someone other than the applicant and that this bidder would plan to open a new mine to develop the coal resources in the North Jacobs Ranch LBA Tract.

The tract under the Proposed Action and Alternatives 2 or 3 potentially includes sufficient coal resources to support a new mine. If a competitive coal sale is held, the successful bidder on the tract could potentially be a party who proposes to start a new coal mine.

This alternative is not analyzed in detail in this EIS. A company acquiring this coal for a new stand-alone mine would require considerable initial capital expenses, including the construction of new surface facilities (i.e., offices, shops,

warehouses, coal processing facilities, coal loadout facilities, and rail spur), extensive baseline data collection, and development of a mining and reclamation plan. In addition, a company acquiring this coal for a new start mine would have to compete for customers with established mines in a competitive market. Development of a new mine on this tract is considered unlikely.

The environmental impacts of developing a new mine to recover the coal resources in the LBA tract would be greater than under the Proposed Action, the No Action Alternative, or Alternatives 2 and 3 because of the need for new facilities, a new rail line, new employment, and the creation of additional sources of dust. In the event that a lease sale is held and the applicant is not the successful bidder, the successful bidder would be required to submit a detailed mining and reclamation plan for approval before the tract could be mined, and this NEPA analysis would be reviewed and supplemented as necessary prior to approval of that mining and reclamation plan.

2.5.2 Alternative 5

Under Alternative 5, the BLM would hold a competitive lease sale for the federal coal lands in an expanded tract configured to include the North Jacobs Ranch LBA Tract and all of the State Section LBA Tract. Evergreen Enterprises applied for the State Section LBA Tract on January 31, 2000. Evergreen Enterprises had applied for a similar tract, the New Keeline LBA Tract, in 1996. The BLM rejected the New Keeline application in 1997.

The New Keeline LBA Tract and the State Section LBA Tract both include most of the area applied for by JRCC in the North Jacobs Ranch LBA Tract, but both also include additional federal coal resources north of the North Jacobs Ranch LBA Tract (See Figure 1-1), which represent about 3,750 additional acres and approximately 193 million additional tons of federal coal. Evergreen Enterprises withdrew an appeal of the decision to reject the New Keeline LBA and their application for the State Section LBA Tract in September 2000.

This alternative was evaluated by BLM prior to the withdrawal of the State Section LBA Tract by the applicant. Under this alternative, it is assumed that the tract could be developed as either a maintenance tract or as a new start mine. The enlarged tract would include sufficient coal resources that a new start mine could be opened. If a competitive coal sale is held, the successful bidder on the tract could be one of the adjacent existing mines, or the bidder could potentially be a party who proposes to start a new coal mine.

The North Jacobs Ranch LBA Tract as applied for includes sufficient coal resources (533 million tons) to justify the expense of starting a new mine. If it is offered for competitive sale, Evergreen Enterprises or another party could submit a bid on the tract as applied for and acquire it, if they

submit the highest bid that meets or exceeds the fair market value as determined by BLM. The acreage that would be added to the North Jacobs Ranch LBA Tract under this alternative would be available for leasing in the future if it is not included in the North Jacobs Ranch LBA Tract.

Leasing the State Section LBA Tract at this time could potentially reduce the per ton fair market value of the federal coal included in the tract. The State Section LBA Tract as applied for includes approximately 712.1 million tons of mineable coal which Evergreen Enterprises proposed to mine at a rate of 12 to 15 million tons per year, for an estimated mine life of 35 years. If this coal was mined at a rate of 21 million tons per year, as currently proposed by the Jacobs Ranch Mine, the estimated time to mine the entire tract would be about 30 years, assuming a 90 percent recovery factor. The fact that some of the coal would not be mined for a number of years reduces the current fair market value of that coal because its estimated value in the future, when it would be mined, must be discounted to the present to determine its current fair market value. The current fair market value of a federal coal tract being offered for lease is an average of the estimated fair market value of all of the coal included in the tract, and adding coal that has a small present value to a tract reduces the per ton value of all the coal in the tract.

The coal that is included in the State Section LBA Tract, but is outside of the North Jacobs Ranch LBA Tract under the Proposed Action, could be combined with other unleased federal coal to the west and north in an application in the future, when it has more immediate mining potential and a higher fair market value as a result. Since adding additional coal to the tract as applied for could, under current market conditions, potentially reduce the per ton fair market value of the federal coal included in the tract, this alternative was not analyzed in detail.

The environmental impacts of mining the State Section LBA Tract as part of an existing mine would be expected to be similar and about equal to the Proposed Action, Alternative 2 or Alternative 3, although mine life would be extended for a longer period of time. If a new mine start is required to mine the coal, the environmental impacts would be expected to be greater than if it were mined as an extension of an existing mine.

2.5.3 Alternative 6

Under Alternative 6, the BLM would delay the sale of the North Jacobs Ranch LBA Tract as applied for to increase the benefit to the public afforded by higher coal prices and/or to allow recovery of the potential CBM resources in the tract prior to mining. Under this alternative, it is assumed that the tract could be developed as a maintenance tract or a new start mine, depending on how long the sale was delayed.

There are two major sources of revenue to state and federal governments from the leasing and mining of federal coal: 1) the competitive bonus bid paid at the time the coal is leased, and 2) a 12.5 percent royalty collected when the coal is sold. This alternative could potentially increase the fair market value of the coal resources in the LBA tract, which could increase the bonus bid when the coal is leased. The price paid for coal from northeastern Wyoming decreased by more than $1.00 per ton from 1992 to 2000, while production of low sulfur PRB coal increased annually since 1992. Coal prices have increased in 2001. There is no assurance that delaying the sale would result in a higher coal price.

The fair market value of the tract and the resulting bonus payment to the government could increase if a lease sale is postponed and if higher PRB coal prices continue, but the postponement would not necessarily lead to higher royalty income to the state or federal governments. Royalty payments are the larger of the two revenue sources. They increase automatically when coal prices increase because they are collected at the time the coal is sold, but they cannot be collected until the coal is leased and permitted and that takes several years. If leasing is delayed, then by the time the coal is mined, the current higher coal prices may or may not persist. Higher royalty payments are being collected on federal coal that is currently leased and being sold at the current higher coal prices. If the higher coal prices do persist, they may enable the coal lessee to negotiate longer term contracts at higher prices, which would result in longer term, higher royalty payments. On the other hand, if the existing mining operation runs out of coal reserves before prices rise, they may have to shut down their operations before additional coal can be leased and permitted for mining. In that case, the fair market value of the coal may actually drop because the added expense of reopening a mine or starting a new mine would have to be factored into the fair market value.

Other considerations include the value of leaving the mineable coal for future development versus the value of making low-sulfur coal available now, in anticipation of cleaner fuel sources being developed in the future. Continued leasing of PRB coal enables coal-fired power plants to meet Clean Air Act requirements without constructing new plants, revamping existing plants, or switching to existing alternative fuels, which would probably significantly increase power costs for individuals and businesses. If cleaner fuel sources are developed in the future, they could be phased in with less economic impact to the public.

A range of the potential future economic benefits of delaying leasing until coal prices rise could be quantified in an economic analysis, but the benefits would have to be discounted to the present, which would make them similar to the Proposed Action and Alternatives 2 and 3.

BLM and the State of Wyoming have approved applications to drill CBM wells on oil and gas leases inside the North Jacobs Ranch LBA Tract. If the North Jacobs Ranch LBA Tract is leased, mining can not occur until the lessee has an approved mining and reclamation permit and MLA mining plan, which should take several years. This should allow time for a large portion of the CBM resources to be recovered from the tract.

The environmental impacts of mining the coal at a later time as part of an existing mine would be expected to be similar and about equal to the Proposed Action, Alternative 2 or Alternative 3. If a new mine start is required to mine the coal, the environmental impacts would be expected to be greater than if it were mined as an extension of an existing mine.

2.6 Comparison of Alternatives

The locations of the Proposed Action and Alternatives 2 and 3 for the North Jacobs Ranch LBA Tract are shown on Figure 2-1. A summary comparison of coal production, surface disturbance, mine life, and projected federal and state revenues for the Proposed Action and Alternatives 1, 2 and 3 for the North Jacobs Ranch LBA Tract is presented in Table 2-1.

Table 2-2 presents a comparative summary of the direct and indirect environmental impacts of implementing each alternative as compared to the No-Action Alternative. The No-Action Alternative assumes completion of currently permitted mining at the Jacobs Ranch Mine for comparison to the North Jacobs Ranch LBA Tract. Table 2-3 presents a comparative summary of cumulative environmental impacts of implementing each alternative. The environmental consequences of the Proposed Action and alternatives are analyzed in Chapter 4.0.

These summary impact tables are derived from the following explanation of impacts and magnitude. NEPA requires all agencies of the federal government to include, in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on:

(i) the environmental impact of the Proposed Action,
(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
(iii) alternatives to the Proposed Action,
(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented (42 USC § 4332[C]).

Table 2-1. Summary Comparison of Coal Production, Surface Disturbance, and Mine Life for North Jacobs Ranch LBA Tract and Jacobs Ranch Mine.

Item	No Action Alternative (Existing Jacobs Ranch Mine)	Added by Proposed Action	Added by Alternative 2	Added by Alternative 3
In-Place Coal (as of 1/1/01)	190.8 mmt	533 mmt	537 mmt	326 mmt
Recoverable Coal (as of 1/1/01)[1]	172 mmt	479.7 mmt	483.3 mmt	293.4 mmt
Coal Mined Through 2000	381.5 mmt	---	—	---
Lease Acres[2]	6,955 ac	4,821.19 ac	4,982.24 ac	3,363.58 ac
Total Area To Be Disturbed[2]	8,122 ac	5,364 ac	5,465 ac	3,689 ac
Permit Area[2]	9,283.78 ac	6,110 ac	6,205 ac	4,131 ac
Average Annual Post-2000 Coal Production	24.5 mmt	-3.5 mmt	-3.5 mmt	-3.5 mmt
Remaining Life Of Mine (post-2000)	7 yrs	23 yrs	23.2 yrs	14 yrs
Average No. of Employees	333	0	0	0
Total Projected State Revenues (post-2000)[3]	$ 189.2 million	$ 527.7 million	$ 531.6 million	$ 322.7 million
Total Projected Federal Revenues (post-2000)[4]	$ 64.0 million	$ 178.6 million	$ 179.9 million	$ 109.2 million

Footnotes:

[1] Assumes 90 percent recovery of leased coal.

[2] For the Proposed Action and Alternatives 2 and 3, the disturbed acreage exceeds the leased acreage because of the need for highwall reduction, topsoil removal and other activities outside the lease boundaries. The permit area is larger than leased or disturbed areas to assure that all disturbed lands are within the permit boundary and to allow easily defined legal land description.

[3] Projected revenue to the State of Wyoming is $1.10 per ton of coal sold and includes income from severance tax, property and production taxes, sales and use taxes, and Wyoming's share of federal royalty payments (University of Wyoming 1994).

[4] Federal revenues based on $4.00 per ton price x federal royalty of 12.5 percent x amount of recoverable coal plus bonus payment on LBA coal of $0.22 per ton based on average of last nine LBA's (Table 1-1) x amount of leased coal less state's 50 percent share.

Table 2-2. Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, Alternative 3 and the No-Action Alternative for the North Jacobs Ranch LBA Tract[2].

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	***MAGNITUDE AND DURATION OF IMPACT***	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION, ALTERNATIVE 2 & ALTERNATIVE 3**
TOPOGRAPHY & PHYSIOGRAPHY		
PERMANENT TOPOGRAPHIC MODERATION could result in:		
Microhabitat reduction	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Habitat diversity reduction	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Reduction in water runoff and peak flows	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Increased precipitation infiltration	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Wildlife carrying capacity reduction	Moderate, possibly short term on existing mine area	Same as No Action on expanded mine area
Reduction in erosion	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Enhanced vegetative productivity	Moderate, beneficial, long term on existing mine area	Same as No Action on expanded mine area
Potential acceleration of groundwater recharge	Moderate, long term on existing mine area	Same as No Action on expanded mine area
GEOLOGY AND MINERALS		
SUBSURFACE changes would result in:		
Removal of coal	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Removal and replacement of topsoil and overburden	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Physical characteristic alterations in geology	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Loss of coal bed methane	Moderate, permanent on existing mine area	Same as No Action on expanded mine area
SOILS		
CHANGES IN PHYSICAL PROPERTIES would include:		
Increased near-surface bulk density	Moderate, long term on existing mine area	Same as No Action on expanded mine area
More uniformity in soil type, thickness, and texture	Moderate, beneficial, long term on existing mine area	Same as No Action on expanded mine area
Increased uniformity in mixed soils (e.g., texture)	Moderate, beneficial, long term on existing mine area	Same as No Action on expanded mine area
Decreased soil loss due to topographic modification	Moderate, beneficial, long term on existing mine area	Same as No Action on expanded mine area
CHANGES IN CHEMICAL PROPERTIES would include:		
Uniform soil nutrient distribution	Moderate, beneficial, long term on existing mine area	Same as No Action on expanded mine area
CHANGES IN BIOLOGICAL PROPERTIES would include:		
Organic matter reduction	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Microorganism population reduction	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Existing plant habitat reduction in soils stockpiled before placement	Moderate, long term on existing mine area	Same as No Action on expanded mine area

[1] Refer to Section 4.0 and 4.1 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-2 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, Alternative 3 and the No-Action Alternative for the North Jacobs Ranch LBA Tract[2] (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	***MAGNITUDE AND DURATION OF IMPACT***	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION, ALTERNATIVE 2 & ALTERNATIVE 3**
AIR QUALITY		
IMPACTS ASSOCIATED WITH MINING OPERATIONS would include:		
Elevated concentrations of TSP	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Elevated concentrations of gaseous emissions	Negligible, short term on existing mine area	Same as No Action on expanded mine area
WATER RESOURCES		
SURFACE WATER		
CHANGES IN RUNOFF CHARACTERISTICS AND SEDIMENT DISCHARGE include the following:		
Disruption of surface drainage systems	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Increased runoff and erosion rates	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Increased infiltration	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Reduction in peak flows	Moderate, long term on existing mine area	Same as No Action on expanded mine area
GROUNDWATER		
GROUNDWATER RESOURCE IMPACT would include the following:		
Removal of coal and overburden aquifers	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Replacement of existing coal and overburden with spoil aquifers	Negligible, long term on existing mine area	Same as No Action on expanded mine area
Depressed water levels in aquifers adjacent to mines	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Change in hydraulic properties	Negligible, long term on existing mine area	Same as No Action on expanded mine area
Change in groundwater quality in backfilled areas	Moderate, long term on existing mine area	Same as No Action on expanded mine area
ALLUVIAL VALLEY FLOORS		
While a final determination has not been made by WDEQ/LQD, it is believed that there are no AVF's significant to agriculture on the proposed lease tract	No impact on existing mine area	Same as No Action on expanded mine area
WETLANDS		
Removal of all existing wetlands	Wetlands on existing mine areas would be mined and reclaimed	Same as No Action on expanded mine area
VEGETATION		
PROGRESSIVE REDUCTION IN NATIVE VEGETATION would result in:		
Increased erosion	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Wildlife and livestock habitat loss	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Wildlife habitat carrying capacity loss	Moderate, long term on existing mine area	Same as No Action on expanded mine area

[1] Refer to Section 4.0 and 4.1 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-2 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, Alternative 3 and the No-Action Alternative for the North Jacobs Ranch LBA Tract[2] (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	***MAGNITUDE AND DURATION OF IMPACT***	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION, ALTERNATIVE 2 & ALTERNATIVE 3**
VEGETATION (Continued)		
AFTER RECLAMATION the following could result:		
Changes in vegetation patterns	Negligible, long term on existing mine area	Same as No Action on expanded mine area
Reduction in vegetation diversity	Negligible, long term on existing mine area	Same as No Action on expanded mine area
Reduction in shrub density	Negligible, long term on existing mine area	Same as No Action on expanded mine area
WILDLIFE		
DURING MINING the following could occur:		
Wildlife displacement	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Pronghorn passage reduction	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Increased mortality rate to small mammals	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Temporary displacement of small mammals	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Sage grouse habitat removal	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Abandonment of raptor nests	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Foraging habitat reduction for raptors	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Loss of nesting and foraging habitat for MBHFI	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Reduction in waterfowl resting and feeding habitat	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Loss of songbird foraging habitat	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Temporary wildlife habitat loss	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Continued road kills by mine-related traffic	Negligible, short term on existing mine area	Same as No Action on expanded mine area
THREATENED, ENDANGERED AND CANDIDATE SPECIES		
MINING IMPACTS could result in the following:		
Loss of black-footed ferret colonies	No impacts on existing mine area	Same as No Action on expanded mine area
Loss of bald eagle nesting and foraging habitat	Negligible, short term on existing mine area	Same as No Action on expanded mine area
Loss of peregrine falcon nesting and foraging habitat	No impact on existing mine area	Same as No Action on expanded mine area
Loss of Ute Ladies-tresses orchid habitat	Negligible on existing mine area	Same as No Action on expanded mine area
Loss of mountain plover habitat	Negligible on existing mine area	Same as No Action on expanded mine area
Loss of swift fox habitat	Negligible on existing mine area	Same as No Action on expanded mine area
LAND USE AND RECREATION		
ENVIRONMENTAL CONSEQUENCES ON LAND USE would be:		
Reduction of livestock grazing	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Loss of wildlife habitat	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Curtailment of oil and gas development	Moderate, long term on existing mine area	Same as No Action on expanded mine area
Loss of public land available for recreation activities	Moderate, short term on existing mine area	Same as No Action on expanded mine area
Loss of coal bed methane reserves	Moderate, permanent on existing mine area	Same as No Action on expanded mine area

[1] Refer to Section 4.0 and 4.1 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-2 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, Alternative 3 and the No-Action Alternative for the North Jacobs Ranch LBA Tract[2] (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	***MAGNITUDE AND DURATION OF IMPACT***	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION, ALTERNATIVE 2 & ALTERNATIVE 3**
CULTURAL RESOURCES		
33 sites not eligible or recommended not eligible for NRHP 1 eligible for NRHP	Impacts to eligible or unevaluated sites are not permitted; any site eligible for the NRHP would be avoided or mitigated through data recovery	Same as No Action on expanded mine area
Possible increase in vandalism		
Possible increase in unauthorized collecting	No impacts on existing mine area No impacts on existing mine area	Negligible on expanded mine area Negligible on expanded mine area
NATIVE AMERICAN CONCERNS	No impact identified on existing mine area	Same as No Action on expanded mine area
PALEONTOLOGICAL RESOURCES		
Overburden removal could expose fossils for scientific examination	No impact identified on existing mine area	Same as No Action on expanded mine area
VISUAL RESOURCES		
EVIDENT IMPACTS DURING MINING include the following:		
Alteration of landscape classified by the USFS as “common”	Negligible, short term on existing mine area	Same as No Action on expanded mine area
IMPACTS FOLLOWING RECLAMATION could be:		
Smoother sloped terrain	Negligible, long term on existing mine area	Same as No Action on expanded mine area
Reduction in sagebrush density	Negligible, short term on existing mine area	Same as No Action on expanded mine area
NOISE		
INCREASED NOISE LEVELS could affect:		
Occupied dwellings within 1 mile	None for existing mine area	Same as No Action on expanded mine area
Wildlife in immediate vicinity	Negligible, short term on existing mine area	Same as No Action on expanded mine area
TRANSPORTATION FACILITIES		
Increase in duration that coal is shipped on railroads and employees travel on highways by 7 to 23.2 years	No impact on existing mine area	Negligible, short term on expanded mine area
Relocation of pipelines	No impact on existing mine area	Negligible, short term on expanded mine area
Relocation of utility lines	No impact on existing mine area	Same as No Action on expanded mine area

[1] Refer to Section 4.0 and 4.1 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-2 Summary Comparison of Magnitude[1] and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, Alternative 3 and the No-Action Alternative for the North Jacobs Ranch LBA Tract[2] (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	***MAGNITUDE AND DURATION OF IMPACT***	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION, ALTERNATIVE 2 & ALTERNATIVE 3**
SOCIOECONOMICS		
EFFECTS DURING MINING would include:		
Employment Potential (No increase of jobs in expanded mine area is expected)	Moderate, beneficial short term on existing mine area	Continued moderate, beneficial, short term on expanded mine area
Revenues from royalties and taxes to the state government	Moderate, beneficial short term on existing mine area	Continued moderate, beneficial, short term on expanded mine area
Revenues from royalties and taxes to the federal government	Moderate, beneficial short term on existing mine area	Continued moderate, beneficial, short term on expanded mine area
Economic development	Moderate, beneficial short term on existing mine area	Continued moderate, beneficial, short term on expanded mine area
Population in Campbell and Converse counties	No impact on existing mine area	Same as No Action on expanded mine area

[1] Refer to Section 4.0 and 4.1 for a discussion on magnitude of impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-3. Summary Comparison of Magnitude and Duration of Cumulative Impacts[1, 2].

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE TYPE AND DURATION OF IMPACT*	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION & ALTERNATIVE 2 & ALTERATIVE 3**
TOPOGRAPHY & PHYSIOGRAPHY		
REDUCED RELIEF AND SUBDUED TOPOGRAPHY could result in:		
Reduction in topographic diversity	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
Increased precipitation infiltration	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
Biodiversity reduction	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
Big game carrying capacity reduction	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
GEOLOGY AND MINERALS		
RECOVERY OF COAL would result in:		
Stabilization of municipal, county and state economies	Significant, beneficial, short term on existing mine areas	Same as No Action on expanded mine areas
SOILS		
RECLAIMED SOILS could result in:		
Increased soil productivity	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
Reduced erosion	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
AIR QUALITY		
IMPACTS ASSOCIATED WITH MINING OPERATIONS would include:		
Elevated concentrations of TSP	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
Elevated concentrations of gaseous emissions	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
WATER RESOURCES		
SURFACE WATER		
IMPACTS TO SURFACE WATER could result in:		
Temporary reduction in soil infiltration rates and increased runoff	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
GROUNDWATER		
IMPACTS ON GROUNDWATER could result in:		
Replacing coal and overburden aquifers with spoil aquifers	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
Drawdown in the coal and shallower aquifers in surrounding areas	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
Water-level decline in the sub-coal Fort Union Formation	Negligible to moderate, short term on existing mine areas	Same as No Action on expanded mine areas
Change in groundwater quality as a result of mining	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas

[1] Refer to Section 4.5 for a discussion of cumulative impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-3 Summary Comparison of Magnitude and Duration of Cumulative Impacts[1, 2] (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE TYPE AND DURATION OF IMPACT*	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION & ALTERNATIVE 2 & ALTERATIVE 3**
ALLUVIAL VALLEY FLOORS	No cumulative impacts anticipated on existing mine areas	Same as No Action on expanded mine areas
WETLANDS		
Removal of existing wetlands	Wetlands on existing mine areas would be mined and reclaimed	Same as No Action on expanded mine areas
VEGETATION		
SURFACE DISTURBANCE would result in:		
Loss of common native vegetation types for wildlife	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
Regional loss of vegetative diversity	Negligible, long term on existing mine areas	Same as No Action on expanded mine areas
WILDLIFE		
IMPACTS ON WILDLIFE FROM SURFACE MINING could result in:		
Loss of pronghorn habitat	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas
Mule deer population reduction	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
Reduction in raptor nesting sites and foraging habitat	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
Reduction in sage grouse leks	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
Loss of nesting and foraging habitat for MBHFI	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
Reduction in waterfowl habitat	Minor, short term on existing mine areas	Same as No Action on expanded mine areas
Permanent reduction in wildlife habitat diversity	Major, long term on existing mine areas	Same as No Action on expanded mine areas
Permanent reduction in some wildlife carrying capacity	Major, long term on existing mine areas	Same as No Action on expanded mine areas
THREATENED, ENDANGERED AND CANDIDATE SPECIES		
No significant cumulative impacts to T & E species are projected	Negligible, short term on existing mine areas	Same as No Action on expanded mine areas
LAND USE AND RECREATION		
IMPACTS ON LAND USE could result in:		
Loss of agricultural production	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas
Disruption of oil and gas development/production	Moderate to significant, short term on existing mine areas	Same as No Action on expanded mine areas
Reduction of wildlife habitat	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas
IMPACTS ON RECREATION could result in:		
Loss of access to public lands used by recreationists, particularly hunting	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas

[1] Refer to Section 4.5 for a discussion of cumulative impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Table 2-3 Summary Comparison of Magnitude and Duration of Cumulative Impacts[1, 2] (Continued).

DESCRIPTION OF POTENTIAL IMPACT BY RESOURCE	*MAGNITUDE TYPE AND DURATION OF IMPACT*	
RESOURCE NAME	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION & ALTERNATIVE 2 & ALTERATIVE 3**
CULTURAL RESOURCES	Sites eligible for NRHP would be mitigated on existing mine areas	Same as No Action on expanded mine areas
NATIVE AMERICAN CONCERNS	No impact identified on existing mine areas	Same as No Action on expanded mine areas
PALEONTOLOGICAL RESOURCES	No impact identified on existing mine areas	Same as No Action on expanded mine areas
VISUAL RESOURCES		
Impacts on visual resources by mining activities	Moderate, short term on existing mine areas	Same as No Action on expanded mine areas
NOISE	No impact anticipated outside of existing mine areas	Same as No Action outside expanded mine areas
TRANSPORTATION FACILITIES		
Continued use of existing transportation facilities	Negligible, short term on existing mine area	Same as No Action on expanded mine areas
SOCIOECONOMICS		
IMPACTS ON SOCIOECONOMICS could include:		
Mineral and energy related development	Moderate, beneficial, short term on existing mine areas	Same as No Action on expanded mine areas
Employment	Significant, beneficial, short term on existing mine areas	Same as No Action on expanded mine areas
Housing market	Significant, short term due to existing mines	Same as No Action on expanded mine areas
Economic development	Significant, beneficial, short term due to existing mine areas	Same as No Action on expanded mine areas
Revenues and royalties	Significant, beneficial, short term due to existing mine areas	Same as No Action on expanded mine areas

[1] Refer to Section 4.5 for a discussion of cumulative impacts.
[2] All impacts are assumed to be adverse unless noted otherwise.

Impacts can be beneficial or 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 judgement 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.