



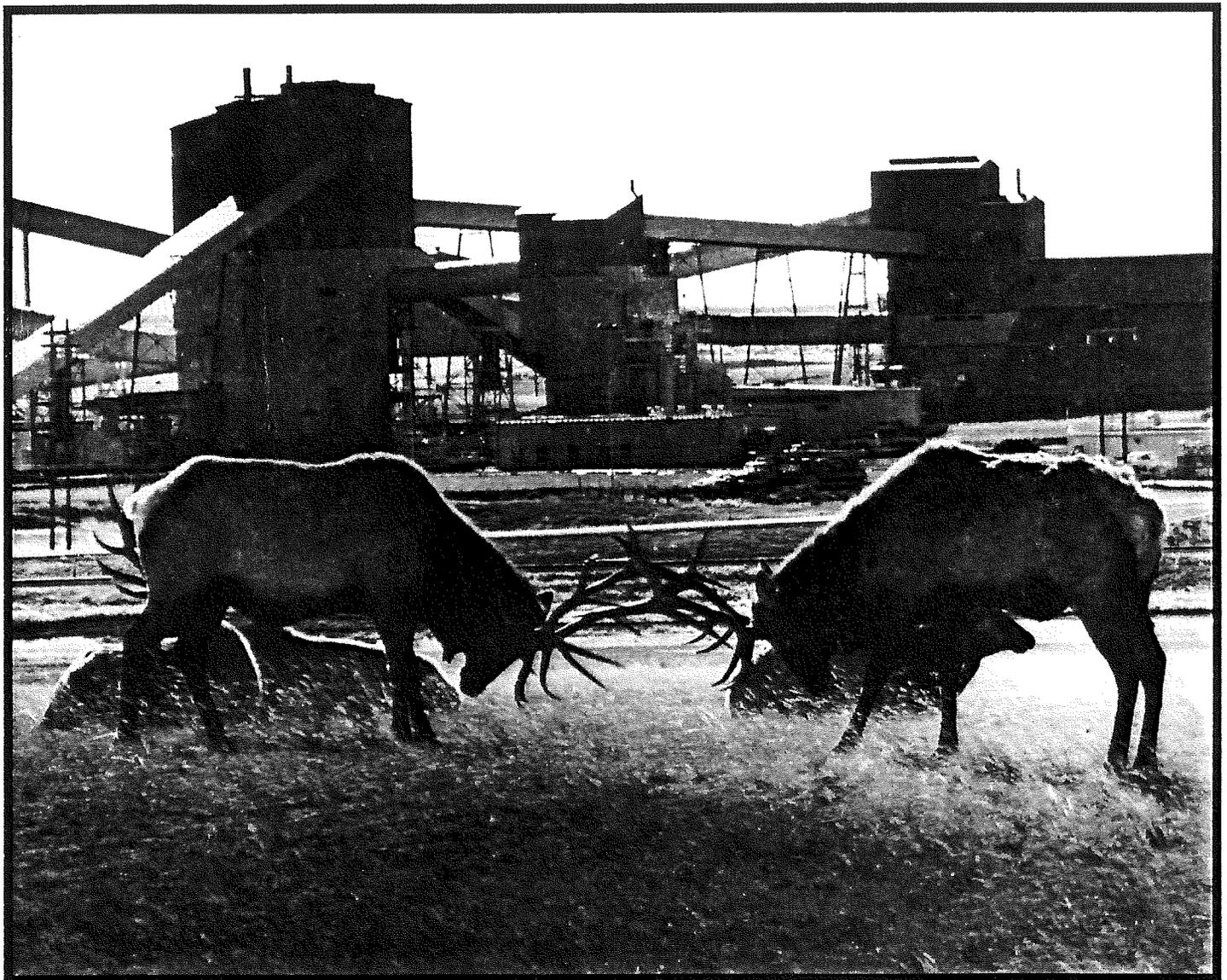
U.S. Department of the Interior
Bureau of Land Management

Casper District Office

March 1992



Final Environmental Assessment for the West Black Thunder Coal Lease Application



The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.

BLM-WY-ES-92-007-4120



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
CASPER DISTRICT OFFICE
1701 EAST E STREET
CASPER, WYOMING 82601



3420
WYW118907

MAR - 4 1992

Dear Reader:

Enclosed is a copy of the final environmental assessment (EA) prepared for the West Black Thunder coal lease application. The Decision Record for the final West Black Thunder EA is scheduled for signing on April 2, 1992. Comments on the final EA, which are received by March 27, 1992, will be considered in preparing the Decision Record. Comments should be addressed to James W. Monroe, Bureau of Land Management, Casper District Office, 1701 East "E" Street, Casper, Wyoming 82601.

Sincerely,

District Manager

Enclosure -
Copy of Final EA



**Final
Environmental Assessment
of the
West Black Thunder Coal Lease Application
as applied for by Thunder Basin Coal Company
(Federal Coal Lease Application WYW118907)**

EA # WY061-2-004

**Prepared by
Casper District
Bureau of Land Management**

**Cooperating Agencies:
US Office of Surface Mining Reclamation and Enforcement
US Department of Agriculture, Forest Service**

March 1992



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SUMMARY

Thunder Basin Coal Company (TBCC) has applied to the BLM for a lease for federal coal adjacent to TBCC's existing Black Thunder Mine (BTM). The tract proposed for leasing is called the West Black Thunder (WBT) tract.

This environmental assessment characterizes and quantifies the environmental impacts that would likely result from leasing the West Black Thunder tract. It also addresses the cumulative impacts of this application and the other pending lease-by-applications.

In preparation of this environmental assessment four alternatives were considered as follows:

- Alternative 1- Lease the coal as a maintenance tract for an existing mine. This case assumes that the applicant is the successful bidder. This is the preferred alternative.
- Alternative 2- Take no action on the lease application.
- Alternative 3- Lease the coal to open a new, stand-alone mine. This alternative assumes that the applicant is not the successful bidder.
- Alternative 4- Postpone the lease sale.

Under Alternative 1 and Alternative 3 the lease would be offered under a competitive bid process, with the coal rights going to the company or individual that submits the highest qualified bid for the property.

Under Alternative 1, the proposed action, the tract would be mined by TBCC in order to extend the life of the BTM. Coal would be recovered from beneath about 3,225 acres of land adjacent to and west of the existing BTM. The tract is assumed to contain 400 million tons of recoverable coal. The reserves requested in the application for the WBT tract would extend the number of years the mine would be able to produce at the currently permitted maximum production rate by approximately 13 years.

Two possible variations of the proposed action may be implemented by BLM. Option A would add about 33 million tons of federal coal underlying approximately 280 acres to the tract, extending the mine life by approximately one year. This coal is located between the WBT tract and Highway 450 and may be bypassed if not mined with the WBT tract. Option B would be to offer the WBT tract for sale in two parcels if BLM determines that offering the tract as two parcels would maximize revenues to the Federal Government. Option B would not change the coal tonnages. The proposed action with Option A included is the preferred alternative of the BLM.

The environmental impacts of Alternative 1, the proposed action, would not be significantly different than the impacts currently resulting from the mining of the current Black Thunder lease, except that the duration of these impacts would be extended. Water-level declines in the coal aquifer due to mining at the current Black Thunder Mine would be extended one mile further to the west. Drawdowns in the overburden aquifer would also be extended further to the west. The spoil aquifer which replaces the coal and overburden would cover a larger area if the WBT tract is mined, and consequently more time

would be required for the water levels to recover and a steady-state flow pattern to resume. Soils and vegetation are similar to those on the adjacent BTM, where reclamation is already occurring. A plan is in place to mitigate any impacts to raptor nests. The one small sage grouse lek on the property can be displaced to similar areas nearby. Cultural resources eligible for the Nation Register of Historic Places would be tested and mitigated prior to disturbance in conformance with an approved treatment plan. Visual impacts would not be changed under the proposed action, but may be increased under Option A due to the proximity of Highway 450. Air quality would be affected to approximately its current level, or less, but these effects would remain for several additional years. Economic benefits would be realized from bonus bid and royalty payments, production taxes and fees, and maintaining present employment levels for at least thirteen additional years (fourteen with Option A).

Alternative 2, the No Action Alternative, would keep the WBT tract essentially as it now exists. A small portion of the tract would be disturbed by overstripping along the existing lease boundary, and the existing disturbance associated with the diversion of Trussler Creek, BK Draw, and Little Thunder Creek would remain until the diversion is no longer needed. Economic and employment benefits associated with the mining of the WBT tract would be foregone.

Alternative 3, leasing the WBT tract for a new stand-alone mine, would have different environmental and economic impacts than Alternative 1. Affected area would increase due to the need to construct a new facilities area, coal preparation and load-out plant, railroad spur and loop, access road, and out-of-pit stockpiles. Air quality under this alternative would be impacted by the cumulative effects of two adjacent mining operations and two coal crushing and load-out plants. Also, it is probable that annual production from two mines would exceed that from a single mine. Royalty and production taxes would be approximately equal under Alternatives 1 and 3, but the annual distribution of these revenues would most likely be different. Employment probably would increase under Alternative 3, as would property taxes due to the need to construct new facilities.

Alternative 4 would delay leasing on the premise that the price of coal in the region may increase and the government may receive more revenues from the lease sale. Under Alternative 4, the impacts could be the same as for any of the previous alternatives, depending on the length of the postponement. If TBCC acquired the lease before the boundary between it and the BTM lease were mined and reclaimed, the tract could be mined as a maintenance tract as proposed. If leasing were delayed beyond that time, impacts would be increased over the proposed action if TBCC acquired the lease, or similar to those for a new start mine if someone else acquired the lease. If leasing were delayed and coal market conditions make it uneconomical as a stand alone mine, impacts would be similar to the no action alternative.



ENVIRONMENTAL ASSESSMENT
of the
WEST BLACK THUNDER COAL LEASE APPLICATION
AS APPLIED FOR BY THUNDER BASIN COAL COMPANY
(Federal Coal Lease Application WYW118907)
August 1991

I. INTRODUCTION

A. Need For Proposed Action

The Powder River Regional Coal Team (RCT) recommended decertifying the Powder River Federal Coal Production Region as a Federal coal production region in October, 1989. The RCT also recommended that it remain in place to periodically review coal leasing in the region. These recommendations were accepted by the Bureau of Land Management (BLM) Director in January, 1990.

The RCT recommendations were based on decreasing industry interest in new competitive Federal coal leasing and the condition of the coal market. Industry interest in leasing federal coal in the Powder River Region dropped from 46 expressions of interest in 22 tracts in 1982 to six expressions of interest in six tracts in 1988, before the region was decertified (Figure 1).

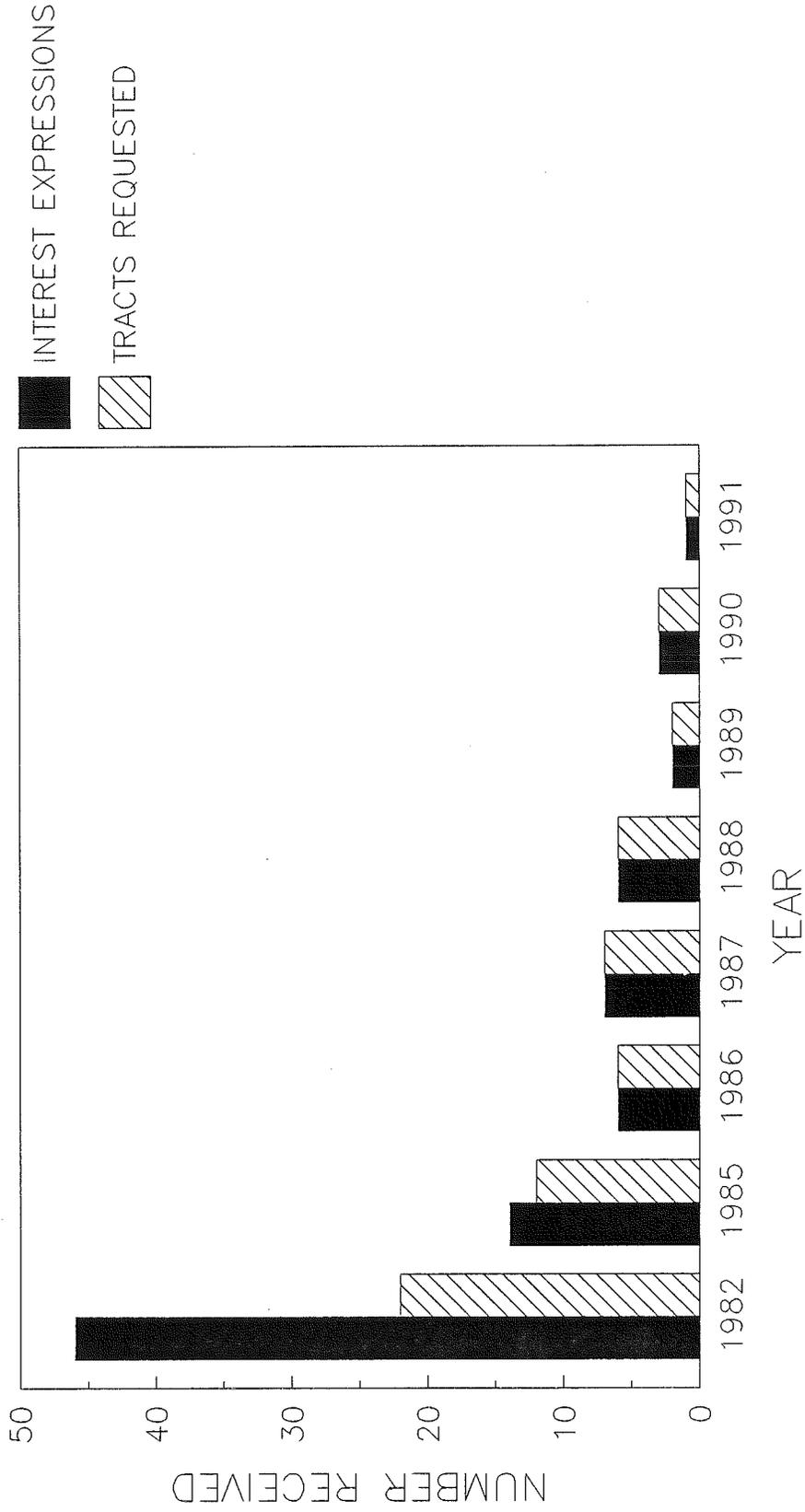
Expressions of interest are nominations of coal tracts for leasing which are made by companies interested in leasing the coal. The RCT periodically sends out requests for expressions of interest in coal tracts in order to assess the level of interest in coal leasing and evaluate the need for leasing coal on a regional basis.

Decertification allows leasing to take place on a lease-by-application (LBA) basis. According to the Powder River Regional Coal Team Operational Guidelines for Coal Lease-By Applications, which were approved by the BLM Director in August, 1991, if an application is either for (1) a tract that would increase permitted production levels or (2) increase production beyond existing production facilities or (3) is for a tract that would be mined by a new mining operation, the RCT members will decide whether to hold a meeting to consider the application and to determine if the RCT should recommend recertifying the Powder River Coal Production Region.

It has been projected that the passage of the 1990 Clean Air Act, with its incentives for use of low-sulfur coal, will lead to renewed interest in low-sulfur Powder River Basin coal. Since the region was decertified, six LBAs have been received for leases in the Wyoming portion of the Powder River Region. Prior to decertification, six expressions of interest for leasing in the region were received. At this time, interest in leasing appears to be at about the same level as it was at the time of decertification.

Five of the LBAs received to date are adjacent to already existing mines. The sixth

**FIGURE 1: COAL LEASING INTEREST
POWDER RIVER COAL REGION
WYOMING AND MONTANA**



1989, 1990, & 1991 =

LBA APPLICATIONS RECEIVED FOR THAT YEAR

SOURCE OF DATA: COAL INTEREST EXPRESSIONS

MADE TO POWDER RIVER BASIN REGIONAL COAL TEAM

application is adjacent to an existing lease which has not been developed as a coal mine. On September 6, 1991, the RCT voted to allow consideration of this tract for leasing.

The BLM must complete three actions for an LBA to be processed. They are a planning and environmental review, geologic review and economic review of the proposed lease area. Leasing by application is a competitive leasing process and a public hearing is required for each LBA.

On December 22, 1989, Thunder Basin Coal Company (TBCC) filed an application, to be effective upon decertification, with the BLM for a coal lease on federal coal reserves located west of and adjacent to TBCC's existing Black Thunder Mine (BTM). Figure 2 is a map showing the location of the area, which is about fifty miles southeast of Gillette, Wyoming. This Environmental Assessment (EA) has been prepared to assist the BLM to make a decision on the proposed lease, to provide a basis for public review, and to comply with the requirements of the National Environmental Policy Act of 1969 (NEPA).

The proposed lease contains approximately 3225 acres of federal coal in Campbell County, Wyoming. Figure 3 is a map showing the location of the proposed lease relative to the adjacent federal lease held by TBCC (i.e. the existing BTM). Also shown on this map are the permit boundaries for the Jacobs Ranch Mine (JRM) to the north, and the North Rochelle Mine (NRM) to the south. The surface of the proposed lease area is owned by private interests and by the federal government under the management of the U.S. Forest Service (USFS). The proposed lease would be mined as part of the existing operations at BTM. After mining, the land would be reclaimed for livestock grazing and wildlife habitat as is the current practice at BTM.

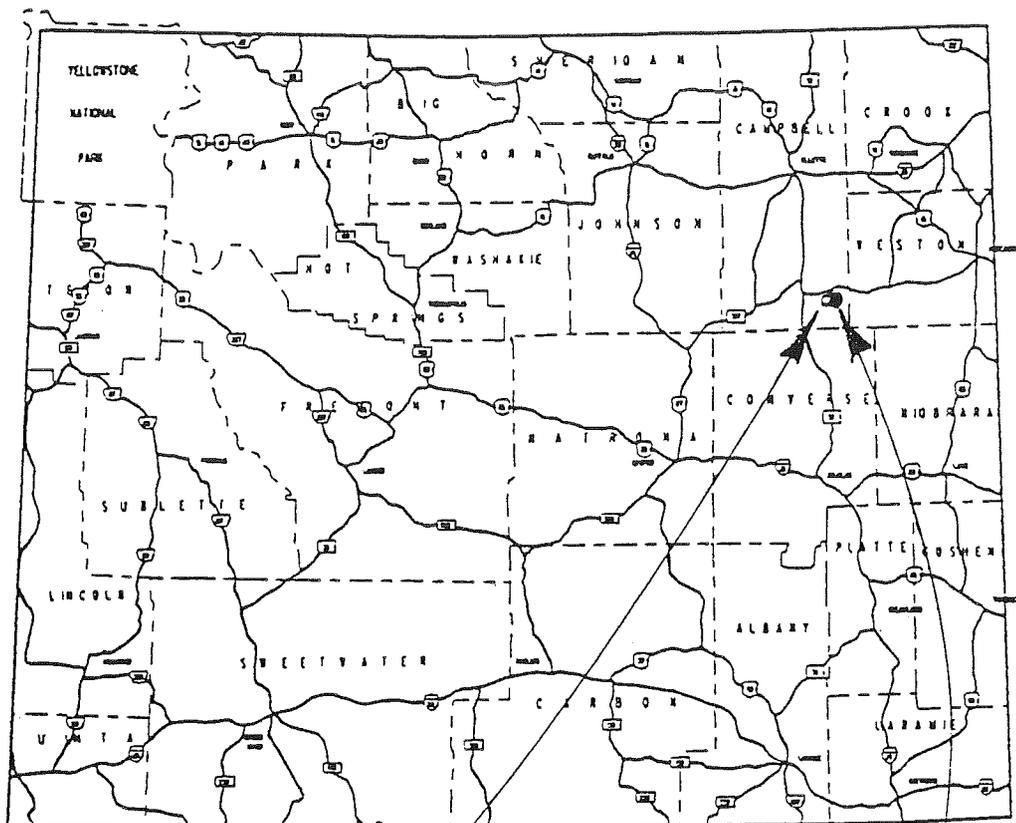
The legal description of the proposed coal lease lands as applied for by TBCC is as follows:

T. 43 N., R. 70 W., 6th P.M. Campbell County, Wyoming
Sec. 18: Lots 5-20 (All)
Sec. 19: Lots 5-20 (All)
Sec. 29: Lots 3-6, 9-16
Sec. 30: Lots 5-20 (All)
Sec. 31: Lots 5-12
Sec. 32: Lots 1-8
Sec. 33: Lots 3-6

TOTAL (applied for) 3224.61 acres more or less

To prevent a potential coal bypass situation in the future, the BLM has determined that the additional lands, which are discussed as Option A in the remainder of the document, will be included in the West Black Thunder coal lease tract (Figure 3). The legal description of the proposed coal lease lands added to the West Black Thunder tract by BLM is as follows:

THE STATE OF WYOMING

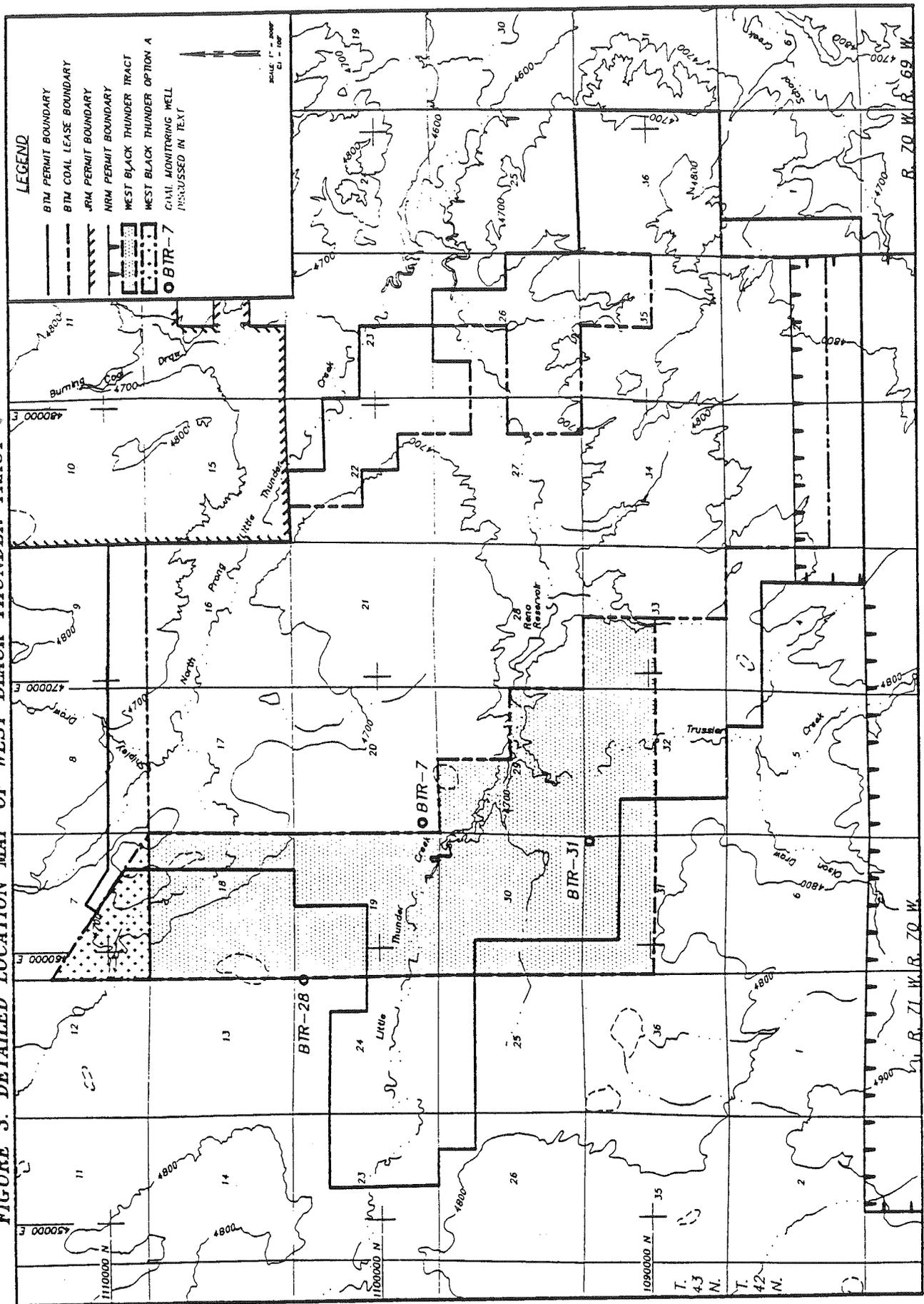


WEST BLACK
THUNDER TRACT

BLACK THUNDER MINE

FIGURE 2. GENERAL LOCATION MAP OF WEST BLACK THUNDER TRACT

FIGURE 3. DETAILED LOCATION MAP OF WEST BLACK THUNDER TRACT



LEGEND

- BTM PERMIT BOUNDARY
- BTM COAL LEASE BOUNDARY
- JRM PERMIT BOUNDARY
- ARM PERMIT BOUNDARY
- WEST BLACK THUNDER TRACT
- WEST BLACK THUNDER OPTION A
- GCM MONITORING WELL DISCUSSED IN TEXT

SCALE: 1" = 2000'
 1" = 100'

110000 N
 120000 N
 130000 N
 140000 N
 150000 N
 160000 N
 170000 N
 180000 N
 190000 N
 200000 N
 210000 N
 220000 N
 230000 N
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T. 43 N., R. 70 W., 6th P.M., Campbell County, Wyoming
Sec. 7: S1/2 of Lot 8, SW1/4 of Lot 13,
Lots 14 thru 18, and NW1/4 and S1/2 of Lot 19

TOTAL (added by BLM) 267.885 acres

TOTAL (to be offered for lease) 3492.495 acres

This legal description and acreage are based on approved U.S. Department of Interior, Bureau of Land Management plats filed in Cheyenne, Wyoming.

B. Conformance With Land Use Plan

Two land use plans govern the federal lands involved with the West Black Thunder (WBT) maintenance tract lease. One is the Buffalo Resource Area Resource Management Plan (RMP), which was prepared in response to the Federal Land Policy and Management Act of 1976 (FLPMA). The plan is described in the Record of Decision (USDI, BLM, October 1985). The second land use plan more directly pertains to the WBT lease application because a portion of the lands applied for are on the Thunder Basin National Grassland (TBNG), for which the USFS is the surface management agency. This plan is the Medicine Bow National Forest and Thunder Basin National Grassland Land and Resource Management Plan (USDA, USFS, November 20, 1985). The proposed action is in conformance with both of the governing land use plans.

After a multiple use conflict evaluation, it was determined that there were no serious surface resource use conflicts on TBNG and that any conflicts which do arise can be mitigated on a case by case basis. The unsuitability criteria assessment for high to moderate coal potential lands in the Thunder Basin National Grassland is contained in Appendix F of the Medicine Bow RMP. The coal leasing unsuitability criteria listed in the Federal Coal Management Regulations (43 CFR 3461) were applied to the entire TBNG study area. Table 1 summarizes the unsuitability criteria (column 1), describes the findings for the entire study area (column 2), and presents a validation of these findings for the WBT tract (column 3). The table shows that none of the lands located on the WBT tract were found unsuitable for leasing, and therefore the tract is available for further consideration for leasing.

C. Relationship To Statutes, Regulations, Or Other Plans

The coal lease application was submitted and will be processed and evaluated under the following authorities: Mineral Leasing Act of 1920 as amended; Multiple-Use Sustained Yield Act of 1960; NEPA; Federal Coal Leasing Amendments Act of 1976 (FCLAA); FLPMA; and the Surface Mining Control and Reclamation Act of 1977 (SMCRA).

FEDERAL WILDLIFE RESTORATION ACT

UNSUITABILITY CRITERIA	FINDINGS FOR TBNG STUDY AREA (USFS, 1985)	VALIDATION FOR WBT
1. Federal Land Systems. With certain exceptions that do not apply to WBT, all federal lands included in the following systems are unsuitable for leasing: National Parks, National Wildlife Refuges, National System of Trails, National Wilderness Preservation System, National Forests and federal lands in incorporated cities, towns and villages.	TBNG is not part of a national forest and none of the other listed federal lands categories is present within the study area.	None of the listed federal lands is present on WBT and the tract is available for further consideration.
2. Rights of Way and Easements. Federal lands that are within rights of way or easements or within surface leases for residential, commercial, industrial or other public purposes, or for agricultural crop production on federally owned surface are unsuitable for leasing.	TBNG contains two rights of way that meet the intent of this criterion: BN railroad and the Tri-County 230 KV transmission line.	Neither of these rights of way is on WBT, and the area is available for further consideration.
3. Buffer Zones for Rights of Way, Communities, and Buildings. Federal lands within 100 feet of a right of way of a public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling.	While TBNG, a school at Wilkinson Ranch headquarters, Wyoming State Highway 39, and 3 ranch headquarters were found to meet the intent of this criterion.	None of the listed rights of way or buildings is on WBT, and the tract is therefore available for further consideration.
4. Wilderness Study Areas. Federal lands designated as wilderness study areas are unsuitable while under review for possible wilderness designation.	No lands within TBNG review area are within a wilderness study area.	There are no unsuitable findings and the WBT tract is available for further consideration.
5. Scenic Areas. Scenic federal lands designated by visual resource management analysis as Class I (outstanding visual quality or high visual sensitivity) but not currently on National Register of Natural Landmarks are unsuitable.	No lands on TBNG meet the scenic criteria as outlined.	There are no unsuitable findings and the WBT tract is available for further consideration.
6. Land Used for Scientific Study. Federal lands under permit by the surface management agency and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments are unsuitable for the duration of the study except where mining would not jeopardize the purpose of the study.	No lands in the TBNG review area are under permit except small enclosures being used to sage reclamation success on existing mines.	There are no unsuitable findings and the WBT tract is available for further consideration.
7. Historic Lands and Sites. All districts, sites, buildings, structures, and objects of historic, architectural, archeological, or cultural significance on federal lands included in or eligible for inclusion in the National Register of Historic Places and an appropriate buffer zone are unsuitable.	On the basis of the consultation with the State Historic Preservation Office, there were no unsuitable findings under this criterion in the TBNG review area.	There are no unsuitable findings and the WBT tract is available for further consideration.
8. Natural Areas. Federal lands designated as natural areas or National Natural Landmarks are unsuitable.	No lands in the TBNG are designated as natural areas or as National Natural Landmarks.	There are no unsuitable findings and the WBT tract is available for further consideration.
9. Critical Habitat for Threatened or Endangered Plant and Animal Species. Federally designated critical habitat for T or E plant and animal species, and essential habitat for T or E species are unsuitable.	There is no federally designated criterion habitat for T or E plant or animal species within the TBNG review area.	There are no unsuitable findings and the WBT tract is available for further consideration.
10. State Listed Species. Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a state pursuant to state law as T or E shall be considered unsuitable.	Wyoming does not maintain a state list of T or E species of plants or animals. Therefore, this criterion does not apply.	There are no unsuitable findings and the WBT tract is available for further consideration.
11. Bald or Golden Eagle Nests. An active bald or golden eagle nest and appropriate buffer zones are unsuitable unless the lease can be conditioned so eagles will not be disturbed during breeding season or unless golden eagle nests will be moved.	The USFS found numerous eagle nests, and buffer zones were established, and determined that coal leasing can occur within the buffer zone if the nests are protected with stipulations and site mitigation plans. There were no unsuitable findings under this criterion, but lands involved in buffer zones are subject to special lease stipulations.	Active eagle nests were found on and near the WBT tract and special lease stipulations may be required to assure protection and mitigation. However, there are no unsuitable findings and the WBT tract is available for further consideration.
12. Bald and Golden Eagle Roost and Concentration Areas. Bald and golden eagle roost and concentration areas on federal lands during migration and wintering are unsuitable unless mining can be conducted in such a way as to ensure that eagles shall not be disturbed.	No golden eagle roost or concentration areas occur on the TBNG review area. Mining planned in the review area is not likely to jeopardize the continued existence of the bald eagle. Coal leasing can occur and adequate protection can be provided. There were no unsuitable findings in the TBNG review area.	There are no unsuitable findings, and the WBT tract is available for further consideration.
13. Federal lands containing an active falcon (excluding kestrel) cliff nesting sites and a suitable buffer zone shall be considered unsuitable.	After consultation with the USFWS, it was determined that this criterion does not apply in TBNG.	There are no unsuitable findings, and the WBT tract is available for further consideration.
14. Habitat for Migratory Bird Species. Federal lands which are high priority habitat for migratory bird species of high federal interest shall be considered unsuitable.	After consultation with the USFWS, it was determined that this criterion does not apply in TBNG.	There are no unsuitable findings, and the WBT tract is available for further consideration.
15. Fish and Wildlife Habitat for Resident Species. Federal lands which the surface management agency and state jointly agree are fish and wildlife habitat of resident species of high interest to the state, and which are essential for maintaining these priority wildlife species, shall be considered unsuitable.	Sage grouse leas were found on and near the TBNG review area. However, methods of mining can be developed which will not have a significant long term impact on the grouse or their habitat. Therefore, the areas involved in leas and buffer zones are not unsuitable.	There are no unsuitable findings, and the WBT tract is available for further consideration.
16. Floodplains. Federal lands in riverine, coastal, and special floodplains shall be considered unsuitable unless stipulated methods of mining can be undertaken without substantial threat of loss of life or property.	After consultation with the USFWS, it was determined that floodplains can be mined with site specific stipulations and resource protection safeguards to be developed during mining and reclamation planning. Therefore, all lands within the TBNG review area are available for further consideration.	There are no unsuitable findings, and the WBT tract is available for further consideration.
17. Municipal Watersheds. Federal lands which have been committed by the surface management agency to use as municipal watersheds shall be considered unsuitable.	There are no municipal watersheds in the TBNG review area.	There are no unsuitable findings, and the WBT tract is available for further consideration.
18. National Resource Waters. Federal lands with national resource waters, as identified by states in their Water Quality Management Plans, and 1/4-mile buffer zones shall be unsuitable.	There are no natural resource waters within the TBNG review area.	There are no unsuitable findings, and the WBT tract is available for further consideration.
19. Alluvial Valley Floors. All lands identified by the surface management agency, in consultation with the state, as AVFs where mining would interrupt, discontinue or preclude farming, are unsuitable. Additionally, when mining federal lands outside an AVF would materially damage the quality or quantity of water in surface or underground water systems that would supply AVFs, the land shall be considered unsuitable.	Lands along prominent drainages were considered potential AVFs pending a final determination by the state. These lands are placed in an "available pending further study" category and are not considered unsuitable.	The state has made a final determination on Little Thunder Creek in the BTM Permit area, which includes Little Thunder Creek on the WBT tract. All declared AVFs are well downstream from WBT. Thus the area is available for further consideration.
20. State or Indian Tribe Criteria. Federal lands to which is applicable a criterion proposed by the state or Indian tribe located in the planning area and adopted by rulemaking by the Secretary are unsuitable.	The state has no applicable criteria and there is no Indian tribe located in or near the planning area. Therefore there is no unsuitability finding.	Various tribal entities were notified by the FS archeologist during scoping process. None expressed concerns. Thus the WBT tract is available for further consideration.

The leasing of federal coal is the responsibility of the BLM under FCLAA. This environmental assessment has been prepared to evaluate the potential impacts of issuing the proposed lease.

After a coal lease is issued, SMCRA gives the Office of Surface Mining Reclamation and Enforcement (OSM) primary responsibility to administer programs that regulate surface coal mining operations and the surface effects of underground coal mining operations. Pursuant to Section 503 of SMCRA, the Wyoming Department of Environmental Quality (WDEQ) developed, and in November 1980 the Secretary of Interior approved, a permanent program authorizing WDEQ to regulate surface coal mining operations and surface effects of underground mining on non-federal lands within the State of Wyoming. In January 1987, pursuant to Section 523(c) of SMCRA, WDEQ entered into a cooperative agreement with the Secretary of the Interior authorizing WDEQ to regulate surface coal mining operations and surface effects of underground mining on federal lands within the state.

Pursuant to the cooperative agreement, federal coal lease holders in Wyoming must submit permit application packages (PAP) to OSM and WDEQ for proposed mining and reclamation operations on federal lands in the state. WDEQ reviews the PAP to ensure that the permit application complies with the permitting requirements and that the coal mining operation will meet the performance standards of the approved Wyoming state permanent program. If it does comply, WDEQ issues the applicant a permit to conduct coal mining operations. OSM, BLM, USFS, and other federal agencies review the PAP to ensure that it complies with the terms of the coal lease, the Mineral Leasing Act of 1920, NEPA, and other federal laws and their attendant regulations. OSM recommends approval, approval with conditions, or disapproval of the mining plan to the Assistant Secretary of the Interior, Land and Minerals Management. Before the mining plan can be approved, the BLM and the surface managing agency (in this case the USFS) must concur with this recommendation.

WDEQ enforces the performance standards and permit requirements for reclamation during the mine's operation and has primary authority in environmental emergencies. OSM retains oversight responsibility for this enforcement. BLM and USFS have authority in those emergency situations where WDEQ or OSM inspectors cannot act before significant environmental harm or damage occurs.

This EA addresses potential impacts which could occur if the proposed lease is issued and mined. If the coal is leased, the lessee will be required to obtain a coal mining permit prior to mining the coal. As a part of that process, a new Mine and Reclamation plan will be developed. Specific impacts which will occur during the mining and reclamation of the coal according to that proposed Mine and Reclamation Plan will be addressed and specific mitigation for any anticipated impacts will be proposed.

There is a significant amount of permitting in addition to the coal mining permit required before mining can commence. Table 2 lists the state and Federal regulatory agencies which must be consulted prior to mining. Table 3 lists the additional permits needed.

Table 2: Federal and State Permitting Agencies

FEDERAL	STATE
Bureau of Land Management	WDEQ Land Quality Division
Forest Service	WDEQ Water Quality Division
Office of Surface Mining Reclamation and Enforcement	WDEQ Air Quality Division
Bureau of Alcohol, Tobacco and Firearms	Solid Waste Program
ARMY Corps of Engineers	State Engineer
Nuclear Regulatory Commission	Industrial Siting Commission
Environmental Protection Agency	State Land Commission
Federal Communication Commission	
Federal Aviation Administration	

Table 3: Federal and State Permit Requirements

FEDERAL	STATE
Coal Lease	Coal Lease
Scoria Lease	Scoria Lease
Exploration Drilling	Permit to Mine (Coal)
Forest Service Special Use	Permit to Mine (Scoria)
Water Treatment: Potable	Water Impoundments & Wells: State Engineer
Wastewater	Water Quality, Land Quality
Water Impoundment	Permit to Construct: Water Quality
Hazardous Waste I.D. Number	NPDES
Nuclear source	
Explosives (Store, Use, Manufacture)	Solid Waste
Ambulance	Radioactive Materials
Radio	Industrial Siting

D. Public Participation

On June 13, 1990, BLM published a Public Notice in the Federal Register (55 FR 23986-7) concerning the WBT coal lease application along with several other coal lease applications. Several general comments were received concerning the LBA process following that Federal Register notice.

Preliminary scoping for developing the initial draft EA was based upon the issues considered in the previously prepared environmental analyses and detailed mine permits for the region. Additional scoping was provided by six scoping meetings in May 1991 that were held in Cheyenne and Gillette, Wyoming. An internal scoping meeting was conducted by USFS personnel during a site tour on May 29, 1991. USFS concerns developed during this tour were conveyed to BLM in a letter dated June 18, 1991 and are addressed in this EA. Additional review and coordination with state and federal agencies was also done. Specifically, letters were written to appropriate agencies advising of the pending lease application and requesting their concerns. Results are discussed below in the sections dealing with the respective environmental disciplines.

In November, 1991, copies of the draft EA were distributed to interested parties (see draft mailing list in section VIII of this EA). Written comments on the draft EA were requested during a 30 day comment period on the draft. Ninety-two written comments were received, and are printed in the Section VII of this final EA. An informal open house and public hearing were held on November 20, 1991, in Gillette, Wyoming. The purpose of the hearing was to receive oral comments on the draft EA, as well as on the fair market value and the maximum economic recovery of the coal on the proposed tract. The public hearing and availability of the draft EA was published in the Federal Register on October 18, 1992. As a result of the written and oral comments, modifications were made to the draft EA.

II. PROPOSED ACTION AND ALTERNATIVES

A. Alternative No. 1: Proposed Lease Sale To Be Mined With Existing Mining Operation- Proposed Action

Under this alternative, the WBT tract would be offered for competitive leasing as applied for subject to standard and special lease stipulations. The boundaries of the tract would be consistent with the tract configuration designated in the TBCC lease application as amended (See Figure 3). Coal resources for the proposed lease are estimated at roughly 400 million tons underlying approximately 3225 acres.

The special lease stipulations required would be as follows:

Section 15. SPECIAL STIPULATIONS - In addition to observing the general obligations and standards of performance set out in the current regulations, the lessee shall comply with and be bound by the following stipulations. These stipulations are also imposed upon the lessee's agents and employees. The failure or refusal of any of these persons to comply with these stipulations shall be deemed a failure of the lessee to comply with the terms of the lease. The lessee shall require his agents, contractors and subcontractors involved in activities concerning this lease to include these stipulations in the contracts between and among them. These stipulations may be revised or amended, in writing, by the mutual consent of the lessor and the lessee at any time to adjust to changed conditions or to correct an oversight.

(a) CULTURAL RESOURCES

(1) Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall conduct a cultural resource intensive field inventory in a manner specified by the authorized office of the BLM or of the surface managing agency, if different, on portions of the mine plan area and adjacent areas, or exploration plan area, that may be adversely affected by lease-related activities and which were not previously inventoried at such a level of intensity. The inventory shall be conducted by a qualified professional cultural resource specialist (i.e., archeologist, historian, historical architect, as appropriate), approved by the authorized officer of the surface managing agency (BLM, if the surface is privately owned), and a report of the inventory and recommendations for protecting any cultural resources identified shall be submitted to the Assistant Director of the Western Support Center of the Office of Surface Mining, the authorized officer of the BLM, if activities are associated with the coal exploration outside an approved mining permit area (hereinafter called Authorized Officer), and the Authorized Officer of the surface managing agency, if different. The lessee shall undertake measures, in accordance with instructions from the Assistant Director or Authorized Officer to protect cultural resource on the lease lands. The lessee shall not commence the surface disturbing activities until permission to proceed is given by the Assistant Director or Authorized Officer.

(2) The lessee shall protect all cultural resource properties within the lease area from lease-related activities until the cultural resource mitigation measures can be implemented as part of an approved mining and reclamation plan or exploration plan.

(3) The cost of conducting the inventory, preparing reports, and carrying out mitigation measures shall be borne by the lessee.

(4) If cultural resources are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the Assistant Director or Authorized Officer, or the Authorized Officer of the surface managing agency. The lessee shall not disturb such resources except as may be subsequently authorized by the Assistant Director or Authorized Officer. Within two (2) working days of notification, the Assistant Director or Authorized Officer will evaluate or have evaluated any cultural resources discovered and will determine if any action may be required to protect or preserve such discoveries. The cost of data recovery for cultural resources discovered during lease operations shall be borne by the surface managing agency unless otherwise specified by the authorized officer of the BLM or of the surface managing agency, if different.

(5) All cultural resources shall remain under the jurisdiction of the United States until ownership is determined under applicable law.

(b) PALEONTOLOGICAL RESOURCES

If a paleontological resource, either large and conspicuous, and/or of significant scientific value is discovered during construction, the find will be reported to the Authorized Officer immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM approved professional paleontologist within five working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological value. Operations within 250 feet of such a discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant interest discovered during the operation.

(c) OIL AND GAS RESOURCES

Coal mining operations conducted on leases issued within producing oil and gas fields shall not interfere with the economic recovery of oil and gas, except as determined by BLM. The rights granted in this lease may be subject to prior existing rights of oil and gas leases encumbering all or part of the same acreage. BLM retains and may invoke authority to alter or modify as it deems appropriate and necessary, coal operations on the lands covered by this lease to avoid interference with these prior existing rights.

If TBCC acquired the lease, the lease would be mined as part of the existing Black

Thunder mining operation. A new Mine and Reclamation plan would be developed to show a logical mining sequence into the acquired lease. Based on the location and movement of the existing pits, it is estimated that coal removal within the acquired lease area would begin in approximately April 1993. Topsoil removal would begin in approximately January 1993. Both these dates assume the appropriate mining permits are obtained in a timely fashion.

The TBCC application for the coal in the West Black Thunder tract was based on the fact that it is a logical western extension of its current BTM operation. In reviewing TBCCs application, the BLM considered the tract configuration and whether additional coal should be added to the tract or removed from the tract on the basis of the geology of the coal in that area. BLM's review of the tract configuration resulted in two potential variations to the proposed action, which are discussed below. Neither of the proposed variations would have significantly different environmental impacts from the proposed action. A decision was made to add the coal between the proposed tract and Highway 450 to avoid a potential bypass of that coal in the future, which is option A, discussed below. Highway 450 is a barrier which increases both the impacts and the expense of mining, so additional acreage was not added north of the highway. Additional acreage was not added to the west because in that direction, the coal is generally deeper and becomes more difficult and less economic to mine, and therefore, lower in value. Extending the mine to the south would add to the distance which the coal would have to be transported to mine facilities, which would increase both expenses and impacts.

The first variation, which is referred to as Option A, would be an alteration to the lease boundary proposed by the BLM to maximize coal removal and avoid bypassing coal. With this option, the north boundary of the WBT tract would be extended northward to within about 200 feet of Wyoming State Highway 450 (Figure 3). Additional affected area, all in Section 7, T43N, R70W, would be around 400 acres (approximately 268 acres would be added to the area to be mined, plus approximately 120 acres of additional disturbance associated with mining). This option would add approximately 33 million tons of coal to the lease. Alternative 1, the proposed alternative, with Option A included, is the preferred alternative of the BLM.

A second variation of the proposed action, herein called Option B, would be to divide the WBT tract into two tracts, with each tract subject to a separate competitive lease sale. A discussion of this variation is included in the EA because the portion of the WBT tract located in Sections 29, 32, and 33 is within an exploration license area applied for by Shell Mining Company, which owns the North Rochelle Mine adjacent to and south of the BTM. Exploration licenses allow interested parties to collect information on coal quality and thickness in areas of unleased federal coal.

The BLM is charged with maximizing revenues from lease sales while considering the impacts to other resources. The option to subdivide the tract was not selected as the preferred alternative because a) dividing the tract and offering it as two smaller tracts would make the WBT tract less attractive to a buyer interested in a potential new stand alone mining operation, and b) a lease application has not been submitted by Shell or any other interested party for a portion of the WBT tract.

B. Alternative No. 2: No Action

Under this alternative, the coal lease application would be denied and the tract would not be offered for sale. This would result in the elimination of future royalty revenues on approximately 400 million tons of coal (433 million tons under Option A) to the federal government, half of which would go to the State of Wyoming. Total royalty revenue on 400 million tons of coal would be \$200 to \$250 million at a price of \$4.00 to \$5.00 per ton, which is the current estimated spot price for the BTM. Economic losses would also affect the individual communities. TBCC's current mine plan (TBCC, 1990, Table III.C.4.1) shows coal production declining after year 1996 and ceasing after 2017. It is reasonable to assume that employment at the BTM, and the associated economic benefits to the local communities would also begin to decline sometime after 1996 without the acquisition of additional reserves.

This alternative would also result in the elimination of the impacts resulting from mining the proposed lease area. The coal could become economically unrecoverable in the future due to changes in the coal industry, in which case, the economic value of the coal resource would not be realized.

C. Alternative No. 3: Proposed Lease Sale For A New Stand-Alone Mine

Under this alternative, the WBT tract would be offered for competitive leasing subject to standard and special lease stipulations. The boundaries of the tract would be consistent with the tract configuration designated in the TBCC lease applications as amended, or consistent with the tract configuration proposed by the BLM under Option A or Option B (See Figure 3). The lease-by-application process is a competitive leasing process, so it is possible that a party other than TBCC could acquire the coal lease and open a new mine.

The same special lease stipulations would be required as for Alternative No. 1 (see section II.A. of this report).

Development of a stand-alone mine would require the construction of new surface facilities including offices, shop facilities, warehouses, coal processing facilities, coal loadout, and railroad spur that would not be required if the tract were developed as an extension of the existing BTM. The cost of these facilities could exceed \$100 million.

There are 25 mining operations in the Powder River Basin of Montana and Wyoming at this time, including the currently idle Kerr-McGee Clovis Point Mine. It is not known if it would be economically feasible to open a new mine in the Powder River Basin at this time. However, due to the size of the WBT coal reserve, a stand-alone mine is considered a possible option. The environmental impacts of a stand-alone mine on this WBT tract are described in Section IV of this Environmental Assessment.

D. Alternative No. 4: Postpone Lease Sale

Under this alternative, the WBT tract would be offered for competitive leasing at an unspecified later date. The BLM has the option of postponing the lease sale on the assumption that coal prices will be higher in the next few years. Higher coal prices have been predicted for Powder River Basin coal as a result of incentives favoring low sulfur coal in the Clean Air Act of 1990. The potential advantage of waiting for higher coal prices is that the bonus bids received by the government could increase as coal prices increase.

There are several potential disadvantages to postponing the lease sale until prices go up. If the sale were postponed beyond the time WBT could be mined in logical sequence with the BTM (i.e., after the adjoining acreage on the existing lease was mined and reclaimed), the costs and impacts of mining the tract would be increased, whether it was mined by TBCC or as part of a new operation. An increased mining cost could actually result in a lower bonus bid.

Also, most revenues to the Federal government from coal leasing accrue from royalty payments, not bonus bids. Royalty payments are a percentage (12.5 percent) of the price of the coal when it is sold. If the coal is leased now, royalty payments will increase as coal prices increase. There is a significant time lag that exists (typically several years) between deciding to lease and bringing the coal to market, due to the time required to conduct the leasing, collect baseline data, obtain the required permits and initiate a logical mining plan. This means that any price rise which occurs in the future may not be fully taken advantage of by waiting for prices to rise before leasing.

Finally, having demonstrable reserves assists an operator in negotiating better prices for long term contracts, which translate into higher royalty payments to the Federal government.

III. AFFECTED ENVIRONMENT

A. General Setting

The proposed lease area is within a region which has been evaluated by several federal environmental analyses which describe the existing and affected environment in the area of the current proposed lease-by applications. These documents contain analyses of the impacts to be expected as a result of surface coal mining in this area. The relevant publications are as follows:

- Part I: Regional Analysis, Final Environmental Impact Statement, Eastern Powder River Coal Basin of Wyoming, Volumes I and II, BLM, October 1974
- Part III: Proposed Mining and Reclamation by Atlantic Richfield Company, Final Environmental Impact Statement, Eastern Powder River Coal Basin of Wyoming, Volume III, BLM, October 1974
- Final Environmental Statement, Eastern Powder River Coal, BLM, March 1979
- Final Environmental Impact Statement, Powder River Coal Region, BLM, December 1981
- Draft Environmental Impact Statement, Round II Coal Lease Sale, Powder River Region, BLM, January 1984
- Amendment to Wyoming Land Use Decisions: Eastern Powder River Basin Area Management Framework Plan: Gillette Review Area, Casper, Wyoming 1980.
- Powder River Coal Regional Tract Summaries, Cheyenne, Wyoming, 1983.
- Buffalo Resource Area, Resource Management Plan (RMP) and Final EIS, BLM, October 5, 1985.
- Coal Bed Methane Environmental Assessment, Eastern Campbell County and Western Johnson County, Wyoming WY-061-0-EA064, Casper BLM, March 1990 (for part of the socioeconomic data).
- Jacobs Ranch Federal Coal Lease Application Environmental Assessment, Casper BLM, June 1991.
- Final Environmental Impact Statement for the Medicine Bow National Forest and Thunder Basin National Grassland Land and Resource Management Plan and Final EIS, U.S. Forest Service, November 1985.

The affected environment also is described in great detail in the Black Thunder Mine and Reclamation Plan (20 Volumes), Permit Number 233-T4, which was approved for a fourth 5-year term of mining by the Wyoming Department of Environmental Quality, Land Quality Division (WDEQ/LQD) on April 1, 1991. This document is on file with the WDEQ/LQD. Moreover, detailed environmental baseline information for the proposed lease area is being gathered by TBCC and various consultants to comply with the WDEQ/LQD requirements for a mine plan submittal. This information includes land use, climatology, geology, soils, vegetation, ground water and surface water hydrology, archaeology, paleontology, history, air quality and wildlife.

These studies have revealed that the following elements of the human environment are either not present in the proposed lease area or would not be affected: Areas of Critical Environmental Concern (ACEC), prime or unique farmlands, floodplains, riparian areas, wild or scenic rivers, or wilderness.

The area is substantially similar to the adjacent BTM for which detailed site-specific environmental data have been collected and environmental analyses have been prepared by TBCC to secure the necessary mining permits. These permits and assessments have been previously reviewed in detail and approved by BLM as providing an adequate environmental assessment and employing appropriate environmental reclamation measures.

The proposed lease area is located west of and adjacent to the existing BTM as shown on Figures 2 and 3. The mine is about 50 miles southeast of Gillette, Wyoming and ten miles east of Wright, Wyoming. Access to the mine is provided by Wyoming Highway 450.

BTM is a surface coal mine owned and operated by TBCC. Coal is mined by a combination truck/shovel and dragline operation. Coal production occurs from six 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. Existing facilities at the mine include crushing, overland conveying, storage, loading, administrative, and equipment maintenance facilities. Railroad access is provided for unit trains operated by the Burlington Northern Railroad and by the Chicago and Northwestern Railroad. Both rail and highway access are shared with Kerr-McGee Coal Company's Jacobs Ranch Mine, located to the north of the highway. Mining activities at Jacobs Ranch Mine are progressing toward the north whereas mining activities at BTM are progressing toward the south and west, which means that the current mining activities for the two mines are moving away from each other.

The initial mine permit for BTM was issued on December 3, 1974 and the first coal was shipped on December 14, 1977. Current production is about 30 million tons per year (mmtpy). The BTM recently obtained an air quality permit which allows them to produce up to 36 million tons of coal per year for the years 1991, 1992 and 1993. BTM's previous air quality permit, which will also be the permitted level in 1994, was for mining up to 30 mmtpy. TBCC's reason

for requesting the temporary air quality permit increase is that they need some flexibility in negotiating new contracts. BTM's current production is around their previous permit level of 30 mmtpy, and they have some long term contracts which will be expiring in the next few years. The added air quality permit level will allow them to provide coal for test burns or negotiate some contracts to replace those which are expiring.

The BTM site is situated in the rolling high plains of northeastern Wyoming. Elevations generally range from 4600 to 4800 ft above mean sea level (msl). The climate is semi-arid. Precipitation averages about 13 inches, with 75 percent of the average precipitation occurring during the growing season, which is from April through September. Summer precipitation is often in the form of brief, intense thunderstorms. Annual evaporation exceeds annual precipitation. The prevailing winds are from the northwest quadrant and the mean annual wind speed is about 8 to 10 mph.

All streams on the mine site and proposed lease tract are ephemeral, meaning they flow only in direct response to precipitation or snowmelt runoff events. Little Thunder Creek and its tributary, North Prong of Little Thunder Creek, cross the mine site from west to east, joining about 1.5 miles east of the current mine permit boundary (Figure 3). Little Thunder Creek is tributary to Black Thunder Creek which flows into the Cheyenne River about 29 miles east of the mine. The Cheyenne River is a tributary to the Belle Fourche River, which joins the Missouri River on the Oahe Reservoir north of Pierre, South Dakota.

B. Affected Resources

1. Geology and Topography

The Powder River Coal Basin of northeastern Wyoming lies within the boundaries of the Powder River structural and topographic basin. The basin is a broad asymmetric syncline bounded on the west by the Big Horn Mountains, on the east by the Black Hills, and to the south by the Casper Arch, Laramie Mountains, and the Hartville Uplift. The basin extends northward into Montana. The axis of the syncline (the deepest part of the basin) is west of the center of the basin.

On the eastern limb of the basin, where the BTM is located, the strata are gently dipping (2 to 4 degrees) to the west. In the area of the BTM, the shallow strata dip two degrees to the west-southwest. Since the proposed WBT maintenance lease tract is located west, or downdip, of the existing BTM, in general, the coal in the WBT tract is deeper than the coal in the existing lease. This means that more overburden must be removed from the proposed WBT in order to mine the coal.

Stratigraphic units of interest in the mine area include, in descending order, recent (Quaternary age) alluvial deposits, the Eocene age Wasatch Formation which comprises the overburden, and the Paleocene age Fort Union Formation (Figure 4). The contact between the

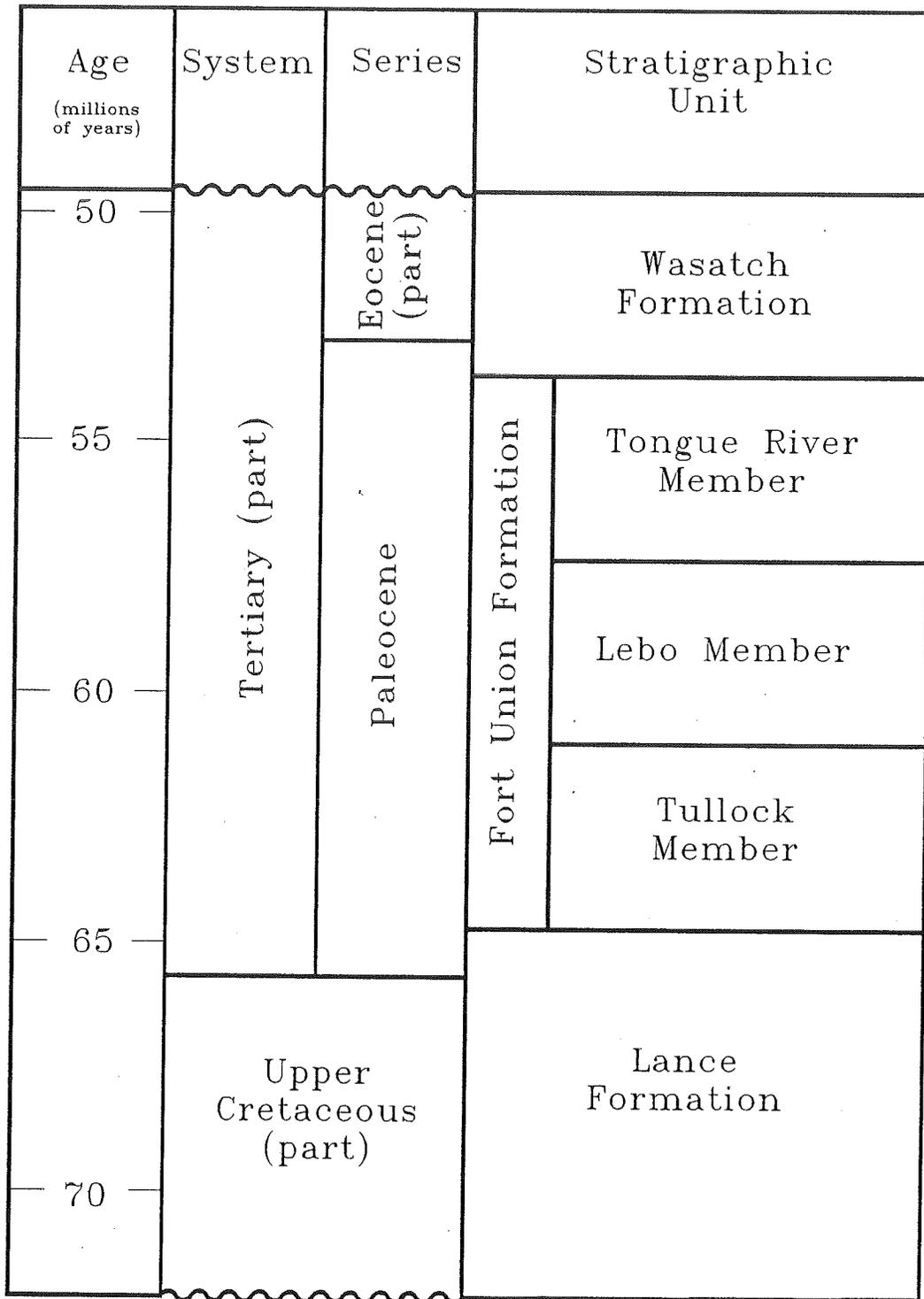


Figure 4. Generalized Stratigraphic Chart for the latest Cretaceous and early Tertiary, Powder River Basin, Wyoming. Modified from Brown, in press, and Law, Rice and Flores, 1991.

Fort Union Formation and the Wasatch Formation is designated as the top of the Wyodak-Anderson coal seam, the main coal seam being mined in the basin.

The alluvial deposits along Little Thunder Creek consist primarily of unconsolidated, discontinuous beds of clay, silt and sand. The Wasatch Formation consists of interbedded shales; siltstones; thin, discontinuous coals; and lenticular sandstones. Where sandstones in the Wasatch Formation are of sufficient porosity and areal extent they serve as aquifers for stock and domestic uses.

The Fort Union Formation consists of non-carbonaceous to highly-carbonaceous shales, mudstones, siltstones, lenticular sandstones, and coal. It is between 3500 and 4000 feet thick in the area of the WBT tract, based on correlation of oil and gas logs drilled within the tract. The Fort Union Formation is divided into three members, which are the Tongue River, Lebo Shale, and Tullock members in descending order (Figure 4).

The Tongue River member reaches thicknesses of 1,750 feet and consists of sandstone, conglomerate, siltstone, mudstone, limestone, coal and carbonaceous shale (Law, Rice, and Flores, 1991). The Wyodak-Anderson coal seam is located at the top of this member in the lease application area. The Wyodak-Anderson coal is sub-bituminous in rank, and is generally a low sulfur, low ash coal deposit. Glass (1982) reported average ash and sulfur values of 6.0 percent and 0.5 percent respectively for 59 Wyodak-Anderson samples. The average Btu/pound values for these samples was 8224. Below the Wyodak-Anderson coal bed, there are 1500 to 2000 feet of interbedded shales, siltstones, sandstones, and thin coal beds, which comprise the rest of Tongue River member.

The middle member of the Fort Union Formation is the Lebo Shale Member. It reaches a maximum thickness of approximately 3000 feet in the Powder River Basin, and consists of sandstone, siltstone, mudstone, coal and carbonaceous shale (Law, Rice and Flores, 1991).

The lower member of the Fort Union is the Tullock, which ranges in thickness from 370 feet in the northwestern Powder River Basin, in Montana, to 1440 feet in the southeastern Powder River Basin, in northwestern Converse County, and northeastern Niobrara County (Brown, in press). The Tullock Member consists of fine-grained sandstone, sandy siltstone, shale, rare thin limestone and coal (Brown, in press). Where the Tullock crops out along the southeastern edge of the Powder River Basin west of Bill, Wyoming, the Tullock consists of greater than 75 percent siltstone and mudstone with minor zones of coal and carbonaceous shale (Brown, in press). Thin, lenticular sandstone beds comprise the remainder of the member (Brown, in press).

A fourth geologic unit, clinker (locally known as scoria), is baked or fused rock formed by spontaneous prehistoric burning of coal seams. Clinker formed by burning of the Wyodak-Anderson coal seam is present along the outcrop of the Wyodak-Anderson coal seam. In the BTM area, clinker is located along the eastern boundary of the current mine area.

Methane, the main component in the natural gas which is used to heat homes, occurs in association with coal beds because it is a by-product of coal maturation. In some areas of the country, most notably in the San Juan Basin of Colorado and New Mexico and the Black Warrior Basin of Alabama, methane from coal beds is being produced and sold in significant quantities. At this time, there is a tax incentive for non-conventional fuels which can be applied to methane produced from coal beds and sold.

In the Powder River Basin, coal bed methane has been produced and sold from several wells at Rawhide Butte Field for several years. Rawhide Butte Field is located several miles west of the Eagle Butte coal mine. Two of the producing wells at Rawhide Butte Field were initially drilled by the WDEQ, to investigate methane leakage at the surface into houses located in a subdivision northwest of Gillette. In 1987, gas seepage problems were responsible for the evacuation of residents at the Rawhide Village and Horizon subdivisions.

There have been a number of reports of methane flowing from shallow water wells and coal exploration drill holes in the Powder River Basin. According to DeBruin and Jones (1989), most of the documented historical occurrences have been in the northern Powder River Basin. Olive (1957) references a water well in T54N, R74W which has produced gas for domestic use since 1916. Discussions of gas produced from shallow wells in and around have been the subject of several newspaper articles in the Gillette newspaper over the years (for example: "Gas Accompanies Flow of Water in Railroad's Well", 1/18/36, well located in the railroad yard, well 740 feet deep; "Vein of Gas Struck on L.C. Reed Ranch", 5/25/48, location 30 miles northwest of Gillette, depth to gas 262 feet; "Gas Struck in Water Well on Ted Barlow Ranch", 4/5/51, ranch location 13 miles west of Gillette, depth to gas 305 feet; and "City Paying \$464,000 to Get Gas Out of Water", 7/10/84, referring to six Fort Union water wells in the city.) None of the reported historic occurrences have been as far south as the BTM area.

The historic occurrence of producible amounts of methane at shallow depths in the northern part of the basin appears to be related to geologic conditions in that area. These geologic conditions include association of the gas with structurally high features in structurally deformed areas, and the existence of effective seals (Law, Rice and Flores, 1991). Without the development of these types of features, which act to trap the gas in the coal or in an adjacent sandstone, most of the gas generated is gradually lost to the atmosphere (Law, Rice, and Flores, 1991). The absence of historic occurrences of gas, and the lack of an indication of structural deformation similar to that in the Rawhide Butte area indicate that coal bed methane is not likely to be a hazard in the BTM area, or the area of the WBT tract. This is substantiated by the fact that TBCC's coal monitoring wells produce only occasional slight amounts of methane.

The terrain in the vicinity of the lease area is gently rolling except along drainages, where channel incision has created some gullying and cut banks. The WBT tract has similar relief to that found in the active mine area, where slopes range from flat to over 19 percent and average about 5.6 percent. On the flatter highlands there are closed topographic depressions. These depressions do not contribute runoff to area streams; runoff in these depressions forms intermittent ponds, or playas, in the bottoms of the depressions.

2. Water Resources

a. Ground Water

The Quaternary alluvial deposits in the BTM vicinity range in thickness from 0 feet in the upper reaches of Trussler Creek to a maximum of about 13 feet at the confluence of North Prong and Little Thunder Creek east of the current mine area. The valley fill deposits range from basal coarse sands and gravels to silty, clayey sediments near the surface.

The Wasatch Formation is not a regional aquifer. The Wasatch is basically a matrix of siltstones and shales with interbedded lenticular sandstones and thin, discontinuous coal seams. The sandstones and coal seams, where they are saturated, can provide water to stock and domestic wells, but they generally do not have the lateral extent of the Wyodak-Anderson coal seam. Recharge to the Wasatch aquifer is from infiltration of precipitation and lateral movement of water from adjacent clinker. Regionally, water is discharged by small springs and seeps along stream drainages, by evaporation and transpiration, and by pumping of wells. There are no known discharge areas in the WBT tract. Regional flow is toward the north; however, the quantity of water is small and the rate of movement is slow because the fine-grained structure of the Wasatch Formation results in a small permeability which impedes the flow of water. Well tests at the Black Thunder Mine indicate hydraulic conductivity of this aquifer varies from 0.077 ft/day to 0.927 ft/day, with a mean of 0.37 ft/day. Martin, et al. (1988) reported a range of 0.2 ft/day to 0.35 ft/day. Transmissivity values for this aquifer as reported by Martin, et al. (1988) are less than 13 ft²/day, while pump tests at the BTM give an average of 16.4 ft²/day.

The Wyodak-Anderson coal bed is the most continuous hydrogeologic unit in the area. Its use as an aquifer is due more to its continuity and thickness than its permeability and quality. Recharge to the coal aquifer occurs primarily from clinker along the outcrop areas. The regional flow pattern is from the outcrop areas northwestward toward discharge areas in the northern reaches of the Powder River structural basin (Daddow, 1986). Because of its westward dip and relatively small yields, the Wyodak-Anderson coal seam ceases to be of interest as an aquifer as distance increases from the outcrop. Where the coal is deeper than a few hundred feet it is subject to little exploitation as an aquifer because there are shallower sandstones and coal seams in the overlying Wasatch Formation which can generally provide adequate water supply for stock and domestic purposes. Near outcrop areas ground-water flow in the coal can be locally controlled by topographic features, and alluvial systems can be local discharge points for the coal aquifer. This situation exists east of the WBT tract. The coal is not influenced by local topography in the WBT tract.

Pump tests in the Wyodak-Anderson coal at BTM have indicated a hydraulic conductivity ranging from 0.16 ft/day to 84.6 ft/day, with an average of 12.0 ft/day. Martin, et al. (1988) give a range of 0.8 ft/day to 0.9 ft/day for the coal. Transmissivities reported in Martin, et al. (1988) for this aquifer are less than 134 ft²/day, while pump tests at the BTM show an average of about 500 ft²/day.

The sub-coal Fort Union aquifers are separated from the coal aquifer by a thick shale sequence. The sub-coal Fort Union can be divided into two hydrogeologic units: the Tongue River-Lebo aquifer, and the Tullock aquifer, (Martin, et al., 1988). The Tongue River-Lebo aquifer consists of lenticular fine-grained shale and sandstone. The Tullock aquifer consists of discontinuous lenses of sandstone separated by interbedded shale and siltstone. Transmissivities are generally higher in the deeper Tullock aquifer, and many mines in the Powder River Basin have wells completed in this interval (Martin, et al., 1988). The average transmissivity for this member as reported in McIntosh, et al., 1984 is 2170 gal/day-ft or 290 ft²/day.

The clinker is the most permeable geologic unit in the area. It has a high recharge capacity, and clinker deposits with large areal extent and saturated thickness can supply large volumes of water to wells. Saturated clinker is an important recharge source for the coal, and is so permeable relative to coal it generally acts as a constant-head boundary (that is, drawdown in coal normally does not appreciably affect water levels in the clinker). At the BTM, pump testing the clinker has produced an estimated transmissivity of 35,400 ft²/day.

The thicknesses of the various units gives an indication of the extent of the groundwater resource present in each. At the BTM, the thickness of saturated overburden varies from zero to about 100 feet and the coal aquifer contains from zero to about 70 feet of saturated thickness. According to Martin, et al. (1988), the subcoal Fort Union averages 2000 feet thick (all saturated), of which the deeper Tullock member comprises an average of 785 feet.

Water quality in the coal aquifer varies as a function of distance from the outcrop. Near the outcrop, where recharge occurs from the clinker and overburden, the dominant ions are calcium, magnesium, sodium and sulfate. As water proceeds down-dip away from recharge areas, sulfate is reduced and the water becomes dominated by sodium and bicarbonate ions. Total dissolved solids (TDS) concentrations in the coal water on the BTM have ranged from about 500 mg/L to over 3,000 mg/L. The 500 mg/L is within the range suitable for drinking water, while the 3,000 mg/L exceeds the recommended level for irrigation (2,000 mg/L) and approaches the maximum level of 5,000 mg/L for livestock consumption (WDEQ/WQD, 1980).

Water quality in the Wasatch Formation in the BTM area is also variable, ranging from a calcium sulfate type to a sodium sulfate or sodium bicarbonate type. TDS concentrations range from about 800 mg/L to over 9,000 mg/L. Water in the clinker is a calcium sulfate type with TDS concentrations generally in the range of 2,000 to 2,500 mg/L.

Water supply for the BTM is obtained from wells and from pit dewatering. A total of eight wells have been used as water-supply wells; six of them are currently producing.

Four of the currently producing wells are completed in the Wyodak-Anderson coal seam or overlying Wasatch Formation. Two of these wells are completed in the scoria, and are associated with scoria removal. The other two drain water from the coal and overburden in the pit area.

Two wells are completed in deep subcoal units in the Tullock member of the Fort Union Formation. This latter water-supply source is a common source for mines, subdivisions and is used as a back-up source of water for the town of Gillette due to its good water quality and large saturated thickness (when numerous sands are encountered) which enables large well yields compared to shallower units. One of the BTM Fort Union wells is completed in seven different sands, with a total thickness of 186 feet, and has a total depth of 2,428 feet. It produced 25.3 million gallons (78 acre-feet) of water in 1990. The other Fort Union well is complete opposite 15 producing zones between 1,000 and 2,200 feet below the land surface. It produced 30.6 million gallons (94 acre-feet) in 1990. These wells are used for drinking, sanitary and industrial uses at the mine; water for dust suppression on haul roads is obtained from pit inflows and sedimentation ponds.

Water from the Fort Union wells is a sodium bicarbonate type with TDS concentrations below 300 mg/L. This water is generally suitable for domestic, stock and agricultural purposes.

Flow patterns in the subcoal Fort Union Formation are similar to those of the coal, with recharge occurring in outcrop areas to the east of the Wyodak-Anderson coal outcrop and regional flow trending to the west and north.

According to information provided in the BTM permit document, there are valid water rights for four water-supply wells on the WBT tract. Three are stock-water wells and one is permitted for "miscellaneous" use. Judging by their depths, one is believed to be completed in the Wasatch overburden and two in the coal seam. The depth of the fourth well is not known.

b. Surface Water

The two largest stream channels which flow across the WBT tract are Little Thunder Creek and its tributary, North Prong of Little Thunder Creek. These streams join about 1.5 miles east of the current mine area (about 5 miles east of the WBT tract). The principal tributary to Little Thunder Creek in the vicinity of the BTM is Trussler Creek. The largest tributaries to North Prong in the immediate area are Shipley Draw and Mills Draw. All channels are ephemeral and have vegetated bottoms. The local drainage system is illustrated on Figure 3.

Little Thunder Creek has a total drainage area of about 62.5 square miles, of which about 10.5 square miles are in closed depressions and do not contribute to area streamflow. The drainage area above the WBT tract is about 38.5 square miles. North Prong has a total drainage area of about 49 square miles, of which 16.6 square miles do not contribute to runoff due to closed topographic depressions. About 30 square miles of the drainage area are above the WBT tract. Average annual runoff for the Little Thunder Creek drainage basin is 0.2 inch or about 10 to 11 acre-feet per square mile (Smith, 1974 and Schumm and Hadley, 1961). The streams are typical for the region, and their flow events are closely reflective of precipitation patterns. Flow events of relatively small peak discharge can result from snowmelt during the late winter and early spring. Although peak discharges from such events are small, the duration and

therefore percentage of annual runoff volume can be considerable. During the spring, general storms (both rain and snow) increase soil moisture, hence decreasing infiltration, and can result in both large runoff volumes and high peak discharges. A general regional storm in May 1978 resulted in the largest runoff on record on Little Thunder Creek and numerous other streams in northeastern Wyoming. Brief, sometimes intense, summer thunderstorms can result in large peak flows, particularly on streams with small drainage areas. In all, streams in this region experience from three to five separate runoff events in a typical year.

c. Alluvial Valley Floors

Both Little Thunder Creek and North Prong within and near the Black Thunder and Jacobs Ranch mines have been subjected to detailed studies to determine the presence or absence of alluvial valley floors (AVF). The BTM permit area, and thus the AVF area subject to investigation, includes all of Little Thunder Creek within the existing permit area and the WBT tract as well. Following completion of these studies, the WDEQ/LQD declared that portions of the Little Thunder Creek and North Prong valleys meet the regulatory intent for AVFs. These areas are small and are located downstream from the current mine area, east of the WBT tract (BTM permit document, Book No. 15, p. II.J.1 and Exhibit II.J-1.9).

d. Wetlands

During the summer and fall of 1991, TBCC conducted a wetlands inventory for the Black Thunder Mine, including the proposed WBT lease area. The inventory was performed in three parts: an inventory of hydric soils; and inventory of hydrophytic vegetation; and inventory of areas exhibiting characteristics of wetland hydrology. The study was conducted by:

TOPIC	PERFORMED BY:
Hydric Soils	James H. Nyenhuis, Certified Professional Soil Scientist, Fort Collins, Colorado
Hydrophytic Vegetation	Warren R. Keammerer, Keammerer Ecological Consultants, Inc., Boulder, Colorado
Wetlands Hydrology and Final Reports Preparation	Nick Tiffany, Certified Professional Hydrologist, Wester Water Consultants, Inc., Western Water Consultants, Sheridan, Wyoming

The development of wetland delineation criteria has been the subject of much debate and federal legislative review. As a result, there have been numerous revisions of the delineation criteria. Since March, 1989, the January 1989 Federal Manual for Identifying and Delineating Vegetated Wetlands (Federal Interagency Committee for Wetlands Delineation (FICWD), 1989 has been used by the four federal agencies responsible for administering the various wetlands

regulations. The four agencies are the Army Corps of Engineers (USCE), the Environmental Protection Agency (EPA), US Fish and Wildlife Service (USFWS), and the Soil Conservation Service (SCS). Proposed revisions to the 1989 wetland delineation manual were published in the Federal Register on August 14, 1991, with a request for public comment. On August 17, 1991, an amendment was approved as part of the 1992 Energy and Water Development Appropriation Act which effectively prohibits the USCE from expending funds for the delineation of wetlands under the 1989 manual. In response to the amendment, USCE has directed that the USCE will apply the Corps of Engineers Wetland Delineation Manual developed in 1987 (USCE, 1987) for the delineation of wetlands until the proposed revisions to the 1989 manual are finalized.

Field work performed in conjunction with the soils and vegetation portions of this survey was conducted during the summer of 1991, before the approval of the amendment to the Energy and Water Development Administration Act, and was therefore conducted in conformance with the 1989 Federal Manual (FICWD, 1989). Hydrology studies were completed after the August 17 amendment, and these studies were performed in consideration of the hydrology criteria utilized in both the 1987 and 1989 wetland manuals. The final report (WWC, 1991) contains a detailed description of the procedures followed during the course of the inventory. In order to be classified as a jurisdictional wetland under the 1987 and 1989 manuals, an area had to possess all three indicators (hydric soils, hydrophytic vegetation, and wetland hydrology).

Western Water Consultants found a total of 107.9 acres within the BTM study area, including the WBT tract, which met the definition of jurisdictional wetlands. The presence of hydrophytic vegetation proved to be the limiting factor in this determination. The study determined there to be 351.4 acres of hydric soils, 118.7 acres meeting the hydrology criteria (basically a frequency and duration of inundation analysis), and 107.9 acres of hydrophytic vegetation. Of this 107.9 acre total, 6.15 acres (4 sites) were comprised of playas, 21.38 acres (3 sites) were associated with man-made reservoirs, and 80.37 acres (9 sites) were within or immediately adjacent to stream channels. Mitigation in accordance with the prevailing USCE regulations will be addressed as part of future mining permits.

3. Soils

An SCS Order 3 soil survey has been completed for the proposed WBT lease area. Some of the map units, such as those on bottomlands of Little Thunder Creek or on slopes of less than 6 percent, were mapped at the more detailed Order 2 level. The SCS mapping is part of the ongoing Soil Survey of Campbell County, Southern Part, which is unpublished at this time (SCS, 1991a.). In addition, TBCC has completed a detailed Order 1 soil survey of the portion of the WBT tract that is within the current permit area. This area was included in the original Order 1-2 BTM soil survey, and soils were described and sampled according to WDEQ soil and overburden guideline specifications (TBCC, 1990 Permit Update, Book 12). A detailed Order 1-2 soil survey, with profile descriptions and laboratory characterization of all major soil types, is being conducted on all WBT proposed lease areas that now have only SCS Order 3 mapping. This work will be conducted during the summer and fall of 1991 subsequent to archaeological

clearance.

Seventeen soil series and two miscellaneous types are contained within 19 SCS map units on the proposed lease area. Dominant soils and relative amounts are similar to those on the current mine permit area. The soil baseline studies in the mine permit document (TBCC, 1990 permit Update, Book 12) contain a complete physical description and laboratory data for these soils. The following is a list of the soils and SCS map units found in the WBT lease area. The soils considered hydric are so noted (SCS 1991b).

- Haverdad loam (considered a hydric soil)
- Bidman loam (playa inclusions are considered hydric)
- Ulm loam and clay loam
- Maysdorf and Pugsley soils
- Cushman and Renohill loams
- Parmleed, in complex with Pugsley on rolling areas on plains, and with Renohill on bedrock controlled fans and hillslopes
- Absted-Arvada-Slickspots complex (playa inclusions are considered hydric)
- Theedle-Kishona-Shingle loams
- Worf loam, in complex with Shingle
- Samday clay loam, in complex with Shingle
- Rauzi fine sandy loam, in complex with Maysdorf

Hydric soils are of limited extent on the proposed lease area, and these have been evaluated, along with possible presence of hydrophytic vegetation and wetland hydrology, as part of the overall WBT wetlands delineation and determination during preparation of the mine permit application document. Wetland determinations are performed under criteria and methods described in the "Federal Manual for Identifying and Delineating Vegetated Wetlands" (FICWD, 1989, and as revised 1991).

Review of the current SCS Campbell County hydric soils list (SCS, 1987) indicates that only one map unit on the WBT tract, the Haverdad loam, meets hydric criteria. Haverdad loam is a well drained soil located on flood plains and low terraces of Little Thunder Creek and Trussler Creek. Trussler Creek occupies only a small part of the proposed lease area. Haverdad also occupies Little Thunder Creek bottomland which bisects the proposed lease area. Some hydrophytic vegetation occurs within the Haverdad map unit delineation.

The Haverdad soil is subject to occasional flooding during prolonged, high-intensity storms from April through June, and is considered by SCS to meet the hydric soil saturation requirement (continuous saturation nearly to the surface for two weeks during the growing season) (SCS, 1991b). However, a question exists concerning the frequency of saturated conditions (i.e., how many years in ten does the soil meet hydric criteria, and the significance

of the infrequent saturation for hydric status). Although quantitative data do not now exist (Derr, 1991), it is thought that perhaps in only two or three years in ten does sufficient spring and early summer precipitation exist for necessary soil saturation to occur.

Playa inclusions in several soil mapping units are considered by SCS to meet hydric criteria. Only the playa portion of the map unit is considered to meet these criteria. The topography of the WBT playas is flat to slightly concave. Runoff from the surrounding terrain is collected into the playa basins where the water is evaporated. About 144 acres in twelve playa areas would be affected by mining the WBT tract.

4. Vegetation

The vegetation in the WBT tract is typical of that found in the southern part of the eastern Powder River Basin and is very similar to the premining vegetation on the existing BTM area. The gently rolling upland areas support mixed-grass prairie and sagebrush-shrubland vegetation types. These vegetation types are similar, being distinguishable by the relative amount of big sagebrush present. These two vegetation types cover about 80 percent of WBT tract, occurring everywhere except in stream channels and the playas.

The mixed-grass prairie vegetation type includes needle-and-thread grass, blue grama, prairie June grass, and western wheatgrass. Big sagebrush accounts for less than ten percent of the total vegetation cover. The sagebrush-shrubland vegetation type has similar species composition to the mixed-grass type, but big sagebrush is more abundant and provides as much as 70 percent of the total vegetation cover.

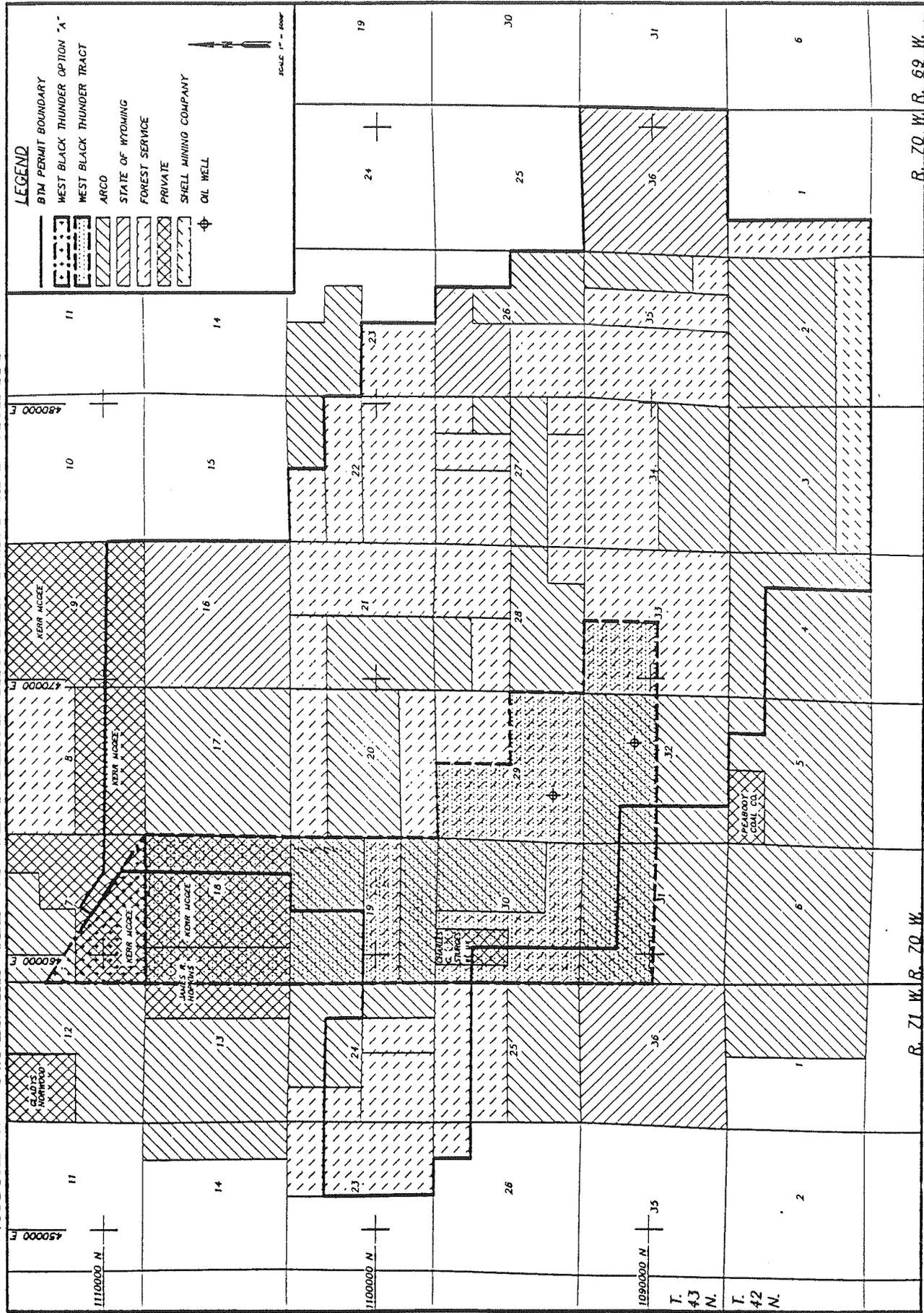
The stream channels are vegetated due to infrequent and short-duration flow events, and they support a streamside-meadow vegetation type. These communities occur as narrow bands along the channel, and major species include Kentucky bluegrass, western wheatgrass, foxtail, and common dandelion.

The playas are either barren or support a grassland vegetation type. Years of evaporation from the lake beds have created saline conditions. It appears that the degree of salinity of the substrata on the lake beds plays an important role in determining whether or not the sites can support vegetation. Sites with clayey substrate, where water cannot readily leach salts downward, tend to have the highest salinity and sparsest vegetation. Western wheatgrass accounts for as much as 85 percent of the total vegetation cover in playa grasslands.

5. Ownership And Use Of Land

The surface on the WBT tract has several separate owners, including Kerr-McGee Coal Corporation, Naomi M. Hopkins and Diane L. Sperber, Charles G. Sturges and Margaret B. Sturges, Atlantic Richfield Company, and the United States of America. Ownership is illustrated on Figure 5. Adjacent surface owners that may be affected by overstripping or surface disturbance include the State of Wyoming and Peabody Coal Company.

FIGURE 5. OWNERSHIP MAP OF WEST BLACK THUNDER TRACT AND VICINITY



The land is currently used for livestock grazing. The USFS uses a stocking rate of 5.5 acres per animal unit month (AUM). At this rate the 3,225-acre WBT tract can support about 586 AUMs, or about 49 animal units over a 1-year period. Of the proposed lease area of about 3,225 acres, about 2,480 acres are currently unavailable for grazing due to the construction of the Little Thunder Creek Diversion. This diversion project, consisting of a series of dams and ditches, intercepts the flows of Trussler Creek, BK Draw, and Little Thunder Creek and diverts the flows northward and around the active mine area to the North Prong Diversion, which conveys the combined flows eastward into the Kerr-McGee Jacobs Ranch Mine permit area. This diversion system is shown on Figure 6, which also shows the boundary of land disturbed to date.

The proposed lease area is in an area where oil and gas production currently exists. There are two producing wells in the area (Figure 5). The well in the SE1/4 SW1/4 Section 29, called the 1 Panos Federal, is on a government lease and produces both oil and gas from the Turner Sandstone for the operator, Sonat Exploration. The well in SW1/4 NE1/4 Section 32, called 1 Reno Fee "F", is a well producing oil from the Niobrara Shale for Y.H.S. Group. There are also three plugged and abandoned wells in the proposed lease area.

The potential for future oil and gas exploration also exists. Approximately two-thirds of the lease application area is underlain by federal oil and gas leases, all of which are currently leased. There are currently no applications for permit to drill on file within the proposed lease area. An approved application for permit to drill is required prior to any drilling for oil and gas, so this indicates that no drilling is currently planned in the area. However, the Niobrara Shale is a fractured shale which makes it prospective for development using horizontal drilling techniques. If Niobrara Shale development in other areas of the Powder River Basin is successful, there could be more oil and gas development in this area.

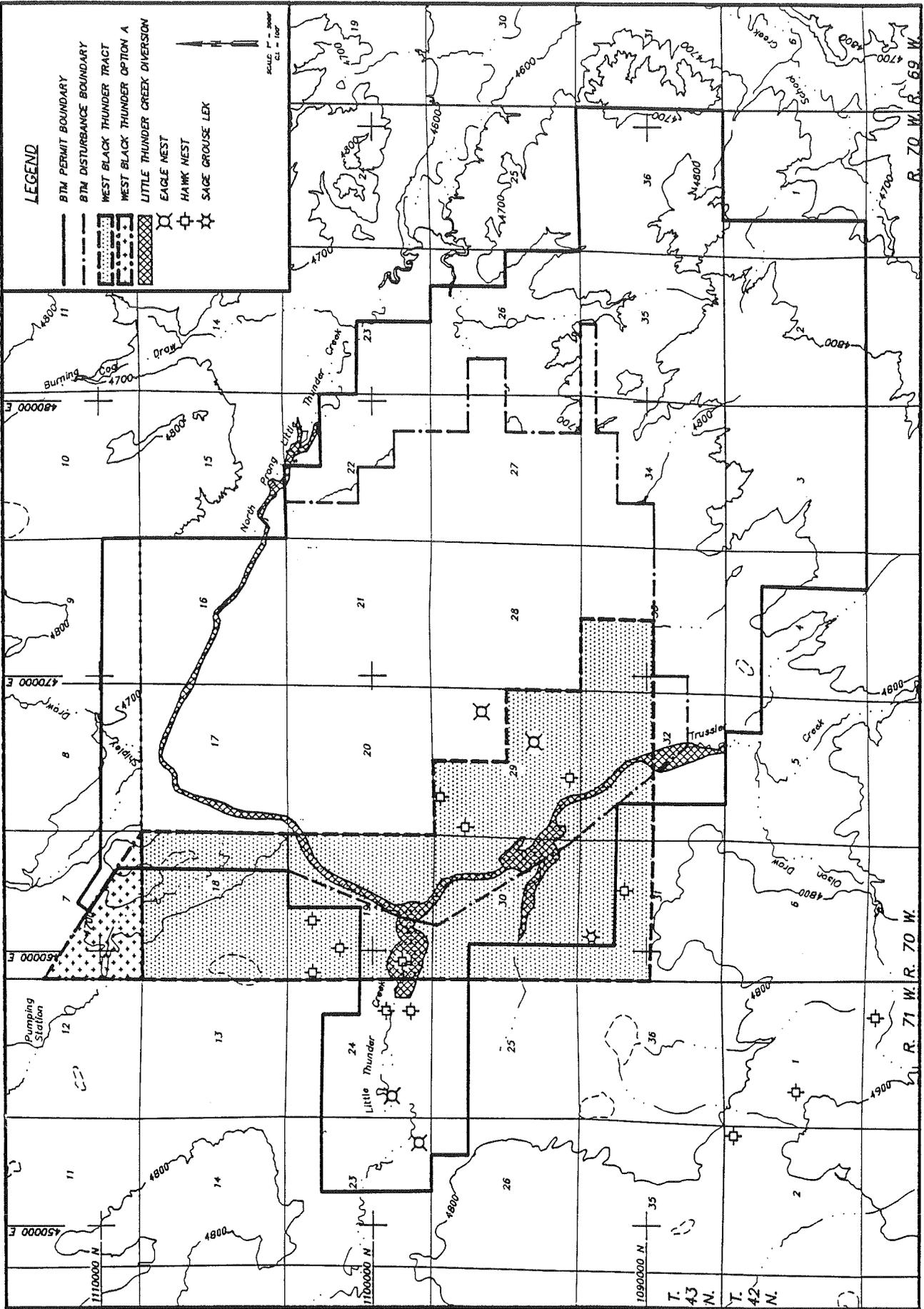
There are no occupied dwellings in the area, and no lands are used for cultivated agriculture. Hunting, primarily for antelope and mule deer, is the main recreational use of the land.

6. Wildlife

Information on wildlife in this area is available from annual monitoring data for (many surveys cover a larger perimeter around the current permit area) as well as from site-specific survey work initiated in spring 1991. The following descriptions of habitats, faunal occurrence, and faunal abundance are drawn from both sources.

The WBT tract is characterized by level to gently rolling topography. Sagebrush-grassland is the predominant habitat in the area, with big sagebrush being the primary shrub. Large areas of playa habitat are present both north and south of Little Thunder Creek. These undrained depressions are seasonal water sources in wet years. They held a substantial amount of water in the spring of 1991 for the first time in recent years. Bottomland or streamside meadows are found along both Little Thunder Creek and the North Prong of Little Thunder

FIGURE 6. LAND USE AND WILDLIFE FEATURES OF WEST BLACK THUNDER TRACT AND VICINITY



Creek.

Three big game species occur in the vicinity of the current BTM permit area: pronghorn, mule deer, and elk. No critical big game habitat is recognized by the Wyoming Game and Fish Department (WGFD) in this area and no critical wildlife issues that would affect leasing were identified (WGFD, May 23, 1991). Winter big game surveys have been conducted annually on the current permit area and its two-mile perimeter, which includes the WBT tract, since 1982. The proposed lease area is in the west-central part of that survey area. From 1982 through 1986, the Black Thunder area was surveyed as part of a larger, regional cooperative aerial big game census. In all years except 1987, the winter surveys were aerial counts. For the past three years, seasonal trend counts have been conducted along a set driving route at BTM to provide big game herd composition and habitat use data in seasons other than winter.

Pronghorn are, by far, the most common big game species in the area. The lands comprising the proposed permit extension are classified by the WGFD as winter/year-long habitat. Winter aerial survey data for the last three years yield pronghorn densities between 3 and 9 animals per square mile on the 83-square-mile Black Thunder survey area. Lowest numbers are from the 1989 survey, when visibility conditions were poor due to patchy snow cover. During the same years, pronghorn densities on the western two-thirds of the survey area (an approximately 47-square-mile area surrounding the proposed lease area) ranged from 5 to 12 animals per square mile. It appears that the WBT tract supports wintering pronghorn at a density comparable to, or slightly greater than, the Black Thunder area as a whole.

Pronghorn are present in the Black Thunder area in substantial numbers all year long. During winter surveys, the majority of sightings are generally in sagebrush-grassland habitat. This habitat is prevalent in the area, and pronghorn use it during all seasons. However, from spring through fall, many pronghorn are recorded in grassland, reclaimed grassland, and other habitats.

Mule deer are present in the Black Thunder area in small numbers year-round. Occasionally small groups or individuals are sighted on or near the proposed lease area, in sagebrush-grassland or along Little Thunder Creek and the North Prong of Little Thunder Creek. The proposed lease area contains no wooded bottomland or rough breaks habitats, so deer do not frequent the area in large numbers.

A herd of elk resides in the Rochelle Hills that border the east edge of the Black Thunder permit area. Small herds have been observed on and near the current permit area during all seasons. No elk have been recorded as far west as the proposed lease area. Although animals do wander from the protection of Rochelle Hills to forage in native and reclaimed habitats at the BTM, it is unlikely that any elk would wander onto the WBT tract.

Surveys for nesting raptors have been conducted annually since 1983 on the current BTM permit area and two-mile perimeter. The proposed lease area is within the two-mile perimeter and, consequently, has been searched for raptor nests over the past nine breeding seasons (1983-

1991). Results of previous surveys have been presented each year in the BTM's annual report to WDEQ/LQD. A mitigation plan for raptor nests in the Black Thunder area was developed in November 1989 in conjunction with the submission of the Black Thunder T-4 permit application. The mitigation plan was approved by the USFWS in December 1989.

Raptor nests on the proposed lease area include eight ferruginous hawk nests in four territories, and one golden eagle nesting platform (Figure 6). One of the ferruginous hawk territories has been consistently occupied since 1983. There are four nests in the territory within the proposed lease area; two ground nests and one platform nest in NW1/4 Section 19, T43N, R70W, and a third ground nest in SW1/4 Section 19. There are two other ground nests within this hawk territory located beyond the proposed lease area in Section 24, T43N, R71W. Adults successfully bred in this territory in 1983, 1986, 1987, 1989, 1990, and 1991. During those six breeding seasons, the adults used five different nests.

The other three ferruginous hawk territories in the proposed lease area have been used sporadically, or not at all, since 1983. In one of those territories there is a single existing ground nest in NE1/4SE1/4 Section 31, T43N, R70W. That nest was active when it was found in 1983, but has been inactive every year since. Adult ferruginous hawks were seen in the territory in 1984 and 1985, but they did not breed. No hawks have been observed in this area during any of the breeding seasons from 1986 through 1991.

There are two nests in the third ferruginous hawk territory in the proposed lease area; a platform nest and a ground nest in NW1/4NW1/4 Section 29, T43N, R70W. The platform nest was built as a mitigation measure in fall 1987. A breeding pair fledged young from the platform in 1988 and 1989. Those were the only two years in which hawks were recorded in the territory from 1983 through 1991.

The fourth potential ferruginous hawk territory in the lease area has not been occupied since 1983. That year, a single ground nest was located in SE1/4SW1/4 Section 29, T43N, R70W. Because the nest has not been used for at least nine breeding seasons, it is in very poor condition.

A golden eagle nesting platform was erected in NW1/4SE1/4 Section 29, T43N, R70W, on the proposed lease area, in fall 1989. The platform was built as an eventual site for eagles that have been the subject of mitigation studies since 1980. The eagles nested in a nearby tree on the existing Black Thunder lease area, in SE1/4NE1/4 Section 29, T43N, R70W, in 1989, 1990, and 1991 (Figure 6). That tree nest was destroyed during inclement weather in June, 1991. Now that the tree nest is not available, it is hoped that the eagles will use the Section 29 platform in the future.

The primary upland game bird species in the Black Thunder area is the sage grouse. The proposed lease area is within a larger area that has been surveyed for game bird leks annually since 1989. Despite the presence of apparently suitable breeding, loafing, and brood-rearing habitat on the permit area and proposed lease area, the sage grouse population in the vicinity of

Black Thunder is small. Sage grouse sightings have been infrequent, and only one lek has been found, in NE1/4NW1/4 Section 31, T43N, R70W. This is at the edge of the current Black Thunder permit area and within the proposed lease area (Figure 6). This lek has been monitored annually since its discovery during an aerial survey in 1984. The greatest number of males ever observed at the lek (21) was during that survey. Peak male counts since that year have ranged from nine to fourteen birds.

No appropriate habitat exists in the vicinity of the proposed lease area for turkeys, sharp-tailed grouse, or gray partridge.

The USFWS and WDEQ have expressed concern about seventeen avian species or subspecies in the Powder River Basin coal region. In 1986, a records search and field surveys were performed to document the occurrence and status of migratory birds of high federal interest (MBHFI) at BTM. Annual surveys for MBHFI have been conducted on and within one-half mile of the current Black Thunder permit area since 1986. This survey area encompasses a large portion of the proposed lease area. In spring 1991, the proposed lease area and its half-mile perimeter were added to the survey area.

Twelve of the seventeen species of MBHFI have been recorded through time on or near the Black Thunder permit area (Table 4). Conclusions regarding MBHFI have not changed since the 1986 report. No non-raptor species of MBHFI regularly use the Black Thunder area. Suitable staging or breeding habitats for the non-raptor MBHFI species do not exist to any significant extent on or near the Black Thunder permit area or the proposed permit extension which would encompass the WBT tract.

Ferruginous hawks and golden eagles are the only MBHFI that nest regularly on or within one-half mile of the proposed permit extension area. These species are discussed above. Nesting habitat for burrowing owls is present, but no nesting pairs have been found near the proposed lease area. No suitable nesting habitat for other raptor MBHFI species exists on the area.

The only threatened or endangered (T or E) species that could occur in the Black Thunder area are the bald eagle and black-footed ferret. Bald eagles are relatively common winter visitors in northeastern Wyoming. No roosting habitat (wooded canyons or large tree groves) exists on or within one mile of the proposed lease area. Bald eagles have been observed foraging on and near the area, but no unique source of prey occurs there. Black-footed ferrets have been known to reside almost exclusively in prairie dog towns. No ferrets have been sighted in the vicinity of the proposed permit extension, and no prairie dog towns exist within one mile of the area.

7. Cultural Resources

The entire proposed lease area (including a buffer zone at least 1/4 to 1/2 mile wide to the north, south, and west) has been inventoried at the Class III level. Metcalf Archaeological

Table 4. MBHFI Status in Northeast Wyoming and Expected Occurrence Near Black Thunder

Species	Seasonal Status/ Breeding Records	Sighting Records in BTM Area	Expected Occurrence in BTM Area
White Pelican	Summer/ Nonbreeder	None	Rare
Double-Crested Cormorant	Summer/ Breeder	BT	Rare
Canvasback	Summer/ One Record	BT	Rare
Ferruginous Hawk	Summer/ Breeder	BT, JR, NR	Common
Golden Eagle	Resident/ Breeder	BT, JR, NR	Common
Bald Eagle	Winter/ Nonbreeder	BT, JR, NR	Common in Winter
Osprey	Summer/ Has Nested	None	Rare
Prairie Falcon	Resident/ Breeder	BT, JR, NR	Uncommon
American Peregrine Falcon	Migrant/ Historical	BT	Rare
Richardson's Meril	Resident/ Breeder	PRES	Rare
Whooping Crane	Never Recorded	None	Very Rare
Sandhill Crane	Migrant/ Nonbreeder	BT	Uncommon
Mountain Plover	Summer/ Breeder	None	Uncommon
Long-Billed Curlew	Summer/ Possible Breeder	BT, JR	Rare
Burrowing Owl	Summer/ Breeder	PRES	Uncommon
Lewis' Woodpecker	Summer/ Breeder	None	Rare
Dicksissel	Summer/ Breeder	None	Rare

*Compiled from Oakleaf, et al. (1982), includes Campbell and Adjacent Counties

**Sighting Record References:

BT = Black Thunder Mine Permit

JR = Jacobs Ranch Mine Permit

NR = North Rochelle Mine Permit

PRES = Powder River Eagle Studies, Unpubl.data

Consultants, Inc. (1987) surveyed approximately 1,400 acres to the west of the current permit area. This included portions of Sections 23 through 26, T43N, R71W, and Sections 19, 30, and 32, T43N, R70W. Frontier Archaeology (Welch and Rosenberg, in progress) surveyed 2,120 acres. This area of examination included portions of Sections 7, 18, 19, 30, and 31, T43N, R70W, and Sections 12, 13, 24, 25, and 36, T43N, R71W. Earlier studies in the existing lease area were conducted by the Wyoming Recreation Commission, Western Cultural Resource Management, Inc., and High Plains Consulting, Inc.

The work by both Metcalf Archaeological Consultants, Inc. and Frontier Archaeology was performed at the Class III level. A Class III survey is a professionally conducted, intensive inventory of a target area, designed to locate all cultural properties which have surface and exposed profile indications. Cultural properties are recorded and sufficient information collected on them to allow evaluation for possible inclusion on the National Register of Historic Places (NRHP). That determination is made by the managing federal agency in consultation with the State Historic Preservation Officer (SHPO). Once the Class III survey is completed, site-specific testing or limited excavation is utilized to gather additional data which will: 1) determine the final evaluation status of a site and/or 2) form the basis of additional work that will be conducted during implementation of a treatment plan if the site is eligible for the NRHP. A treatment plan is then developed for those sites that are eligible for the NRHP and are within the area of potential effect. Treatment plans are implemented prior to mining and can include such mitigative measures as avoidance (if possible), large scale excavation, complete recording, Historic American Building Survey/Historic American Engineering Record documentation, archival research and other acceptable scientific practices.

A total of 22 cultural resource sites have been identified on the West Black Thunder lease tract and additional 14 sites have been identified within a one-mile buffer zone, for a total of 36 sites. On the lease tract itself, two sites are eligible for the NRHP, 15 sites are not eligible, and five sites are unknown with regard to their NRHP eligibility. Within the buffer zone, one site is eligible for the NRHP, seven sites are not eligible and six sites are unknown with regard to the NRHP eligibility. The current status for each site is shown on Table 5. All sites that have been determined ineligible for inclusion on the NRHP will require no further work prior to mining. All sites which are unknown with regard to their NRHP eligibility will have enough site-specific testing conducted to determine their eligibility, and if necessary, their final treatment. Prior to disturbance, a detailed treatment plan will be developed and implemented for all sites eligible for the NRHP.

The following information is provided to compare the cultural resource of the WBT tract to the active BTM. In 1982, Chapman and Miller identified 127 sites composed of 106 prehistoric and 21 historic sites on the 11,827 acre BTM and associated buffer zone. Welch has identified 26 prehistoric, 6 historic and 4 prehistoric/historic sites on the 8320 acre WBT tract and buffer zone through a literature search conducted through Wyoming SHPO. These numbers do include some overlap because the proposed WBT lease area covers part of the original BTM buffer zone. In comparison, site density on the WBT tract is less than 1/2 that observed on the BTM tract. In addition, preliminary information suggests that sites located on WBT lease tract

Table 5. Status of Known Cultural Sites Within the West Black Thunder Tract and One-Mile Buffer Zone

Site	Type	Location	NRHP Status
48CA-2685	Historic	Lease	Unknown
48CA-2686	Historic	Lease	Unknown
48CA-2687	Historic	Buffer Zone	Unknown
48CA-2688	Historic	Buffer Zone	Unknown
48CA-2725	Prehistoric and Historic	Buffer Zone	Unknown
48CA-2726	Prehistoric and Historic	Buffer Zone	Unknown
48CA-2727	Prehistoric	Buffer Zone	Unknown
48CA-401	Prehistoric	Lease	Unknown
48CA-402	Prehistoric	Lease	Unknown
48CA-1175	Historic	Buffer Zone	Eligible
48CA-1807	Historic	Lease	Eligible*
48CA-2481	Prehistoric	Buffer Zone	Unknown
48CA-1724	Prehistoric	Lease	Not Eligible
48CA-2229	Prehistoric	Lease	Not Eligible
48CA-2231	Prehistoric & Historic	Lease	Not Eligible
48CA-2333	Prehistoric	Lease	Not Eligible
48CA-1730	Prehistoric	Lease	Not Eligible
48CA-1731	Prehistoric	Lease	Not Eligible
48CA-1732	Prehistoric	Lease	Not Eligible
48CA-1733	Prehistoric	Lease	Not Eligible
48CA-1734	Prehistoric	Lease	Not Eligible
48CA-1736	Prehistoric	Lease	Not Eligible
48CA-1809	Prehistoric	Lease	Not Eligible
48CA-1729	Prehistoric	Lease	Eligible
48CA-1474	Prehistoric	Lease	Unknown
48CA-1769	Prehistoric & Historic	Lease	Not Eligible
48CA-1808	Prehistoric	Lease	Not Eligible
48CA-2226	Prehistoric	Lease	Not Eligible
48CA-1770	Prehistoric	Lease	Not Eligible
48CA-2593	Prehistoric	Buffer Zone	Not Eligible

Site	Type	Location	NRHP Status
48CA-2227	Prehistoric	Buffer Zone	Not Eligible
48CA-2228	Prehistoric	Buffer Zone	Not Eligible
48CA-2230	Prehistoric	Buffer Zone	Not Eligible
48CA-2331	Prehistoric	Buffer Zone	Not Eligible
48CA-2332	Prehistoric	Buffer Zone	Not Eligible
48CA-1157	Prehistoric	Buffer Zone	Not Eligible

* Site 48CA-1807 is being changed from eligible to non-eligible.

do not contain the level of significant data as several of those tested and mitigated at the BTM. Of the original 127 sites located on the BTM, 19 were identified for further work including evaluative testing and mitigation.

The more significant of the 19 sites mentioned above include the Lampkin homestead site (48CA897), a large stone circle habitation site (48CA1780), and several short and long term camp processing sites (i.e., 48CA403, et al.). Information gained from work conducted at the BTM will be extensively utilized to assess the significance of the sites located on the WBT lease tract and to determine appropriate treatment of those sites.

8. Native American Consultation

Native American consultation and coordination as required by the Archeological Resources Protection Act and the American Indian Religious Freedom Act was conducted during the time of the EA public review and final EA preparation periods. Affected tribes were sent certified letters requesting their comments concerning any religious or cultural areas within or near the Black Thunder tract. The list of people included in the special mailing is included in the draft EA mailing list included in Section VIII of this final EA. One comment letter was received as a result of that mailing. That letter was a request for additional information. The comment letter and BLM response are reproduced in the comment letter section in the back of the final EA. The information requested was supplied, and no further comments or requests were received.

9. Paleontological Resources

The surface formation at Black Thunder Mine is the lower Eocene Wasatch Formation. The Wasatch Formation, within the Black Thunder permit area and areas to the west (including the West Black Thunder tract), is expressed as rolling hills and low buttes, with many of the ridges capped with yellow-brown channel sandstones often containing sparse plant remains. It comprises the overburden which must be removed to mine the underlying coal.

In 1975 all bedrock outcrops on the Black Thunder permit area were searched for fossil material by Dr. Dale Hoffman, a consultant hired by Atlantic Richfield Company. In addition,

harvester ant hills were carefully examined where they occurred in the vicinity of an outcrop. If fossil material is available near the nest, fragments will be gathered by the ants and placed on the surface of the hill. To date, no significant vertebrate or invertebrate fossil remains have been found. Where plant fossils occurred, collections were made and the locality noted.

The limited flora fossils collected during the survey were of interest; however, they are not unique to the Powder River Basin. This fact, along with the lack of significant invertebrate and vertebrate fossils, indicates that disturbance of these areas would not impact any significant paleontological deposits.

10. Visual Resources

For management purposes, the BLM conducts an inventory that evaluates visual resources on all land under its jurisdiction. Once inventoried, these lands are classified into various management classes. These classification ratings range from 1 to 5 as follows:

Class 1 - Natural ecologic changes and very limited management activity is allowed. Any contrast (activity) within this class must not attract attention.

Class 2 - Changes in any of the basic elements (form, line, color, texture) caused by an activity should not be evident in the landscape.

Class 3 - Contrasts to the basic elements caused by an activity are evident but should remain subordinate to the existing landscape.

Class 4 - Activity attracts attention and is a dominant feature of the landscape in terms of scale.

Class 5 - This classification is applied to areas where the natural character of the landscape has been disturbed to a point where rehabilitation is needed to bring it up to the level of one of the other four classifications.

When development is proposed, the degree of contrast between the proposed activity and the existing landscape is measured. This is called a contrast rating. In this process, various factors such as form, line, color, texture variety, contrast and lighting are evaluated.

The lands in the proposed lease area are generally classified as VRM Class 4 with some Class 5 where land has been disturbed to construct the Little Thunder Creek Diversion. Mining activity would not encounter any visual classification that would prohibit or restrict surface coal mining. Contrast would remain virtually unchanged.

11. Noise

An individual's judgement of the loudness of a noise correlates well with the A-weighted sound level (dBA) system of measurement. The A-weighted sound level, or A-scale, has been used extensively in the U.S. for the measurement of community and transportation noises. Figure 7 relates A-scale decibel readings to equivalent sounds of daily life. The existing noise sources in the proposed lease area are wind, coal mining activities and limited agricultural

activities. From these sources, the current noise level is estimated to be in the range of 30 to 45 decibels, depending on time of day and location. Mining in the immediate area would increase the noise level to a range of 85 to 95 decibels where actual operations are occurring.

12. Air Quality

The air quality of the area is generally good with average annual particulate concentrations of 15 micrograms per cubic meter (ug/m^3) (average annual geometric mean for total suspended particulates, TSP). Visibility for more than 60 miles is common. Significant reductions in visibility are generally weather-related, although major forest fires to the west and northwest have impaired visibility in the Powder River Basin. A detailed description of the air quality of the area has been produced for the BLM (PEDCo, 1983).

The basic regulatory framework which governs air quality in Wyoming is the Environmental Quality Act, the accompanying Air Quality Rules and Regulations, and the State Implementation Plan (SIP) approved by the Environmental Protection Agency (EPA) under the Clean Air Act. This regulatory framework includes state air quality standards, which must be at least as stringent as National Ambient Air Quality Standards (NAAQS), and allowable increments for the prevention of significant deterioration (PSD) of air quality. The air quality standards which apply to coal mining are listed in Table 6. The large areas of disturbed land, crushing, loading and hauling of coal, and blasting associated with mining all produce dust which make the particulate standards the most important air quality issue for surface mining.

The current particulate standards in Wyoming are for an annual average of $50 \text{ ug}/\text{m}^3$ and 24-hour average of $150 \text{ ug}/\text{m}^3$ both for particulate matter 10 micrometers and less in diameter (PM10) and a 24-hour average of $150 \text{ ug}/\text{m}^3$ for TSP. The 24-hour standards are not to be exceeded more than once per year. The various motor vehicles used in mining and transport of coal and people also produce carbon monoxide, nitrogen oxides, sulfur dioxide and by secondary processes, ozone, though these are seldom at levels to cause regulatory concerns at Wyoming's surface coal mines.

The PSD program is designed to protect air quality from significant deterioration in areas already meeting state standards. In other words, an increase or increment is allowed above baseline pollution levels so long as the state standard is not exceeded. The size of the increment allowable under PSD depends on the area's designation as a Class I, II, or III area, with Class I areas allowed the smallest increment and Class III the largest. The mine area, as is all of

Figure 7. Relationship Between A-Scale Decibel Readings and Sounds of Daily Life

	How it Feels	Equivalent Sounds	Decibels	Equivalent Sounds	How it Sounds
Danger to hearing ↑	Near permanent damage level from short exposures	50 hp siren (100 ft.) Jet engine (75 ft.) Turbo-fan jet at takeoff power (100 ft.)	130	Jackhammer Chainsaw Firecracker (15 ft.)	135dB(A) Approx. 64 times as loud as 75dB(A)
	Pain to ears	Scraper-loader	120	Rock and roll band Unmuffled motorbike (2-3 ft.)	125dB(A) Approx. 32 times as loud as 75dB(A)
	Uncomfortably loud	Jet fly over (1,000 ft.)	110	Car horn	115dB(A) Approx. 16 times as loud as 75dB(A)
	Discomfort threshold	Noisy newspaper press	100	Unmuffled cycle (25 ft.)	105dB(A) Approx. 8 times as loud as 75dB(A)
	Very loud	Air compressor (20 ft.) Power lawnmower Steady flow of freeway traffic	90	Garbage trucks and city buses	95dB(A) Approx. 4 times as loud as 75dB(A)
	Conversation stops	10-HP outboard motor Automatic dishwasher	80	Diesel truck (25 ft.) Garbage disposal Food blender	85dB(A) Approx. 2 times as loud as 75dB(A)
	Intolerable for phone use	Vacuum cleaner	70	Muffled jet ski (50 ft.) Passenger car, 65 mph (25 ft.) Busy downtown area	75dB(A)
	Extra auditory physiological effects	Window air conditioner outside at 2 ft. Window air conditioner in room	60		
	Quiet	Occasional private auto at 100 ft.	50	Normal conversation	55dB(A) Approx. 1/4 as loud as 75dB(A)
	Very quiet ↑	Sleep interference	Quiet home during evening Bird calls Library	40	
		Soft whisper 5 ft.	30		35dB(A) Approx. 1/16 as loud as 75dB(A)
			20	In a quiet house at midnight	
		Leaves rustling	10		

Adopted From ABC's of Our Noise Codes, published by Citizens Against Noise, Honolulu, Hawaii

Wyoming outside the National Parks and wilderness areas, is Class II. Wyoming's PSD standards, which are identical to federal standards, are summarized in Table 7, except that Wyoming has not adopted Class III standards.

Table 6. Regulated Air Emissions for Wyoming

Emissions	Averaging Period	Wyoming Standard (ug/m ³)	National Standard (ug/m ³)
Total Suspended Particulate (TSP)	24-hour ¹	150	---
Particulate matter finer than 10 microns (PM-10)	24-hour ¹	150	150
	annual ³	50	50
Nitrogen oxides (NO _x)	annual ³	100	100
Photochemical oxidants (O ₃)	1-hour ¹	160	235
Sulfur dioxide (SO ₂)	3-hour ¹	1,300	---
	24-hour ¹	260	365
	annual ³	60	80
Carbon monoxide (CO)	1-hour ¹	40,000	40,000
	8-hour ¹	10,000	10,000

¹ Standards not to be exceeded more than once per year.

² Annual geometric mean not to be exceeded

³ Annual arithmetic mean not to be exceeded

Table 7. Maximum Allowable Increases for Prevention of Significant Deterioration of Air Quality in Wyoming

EMISSION	AVERAGING TIME	MAXIMUM ALLOWABLE CONCENTRATION INCREASE (micrograms per cubic meter)		
		Class I	Class II	Class III
Sulfur dioxide	Annual Mean	2	20	40
	24-hours ¹	5	91	182
	3-hour ¹	25	512	700
Total Suspended Particulate (TSP)	Annual Mean	5	19	37
	24-hour ¹	10	37	75

¹ Not to be exceeded more than once in any 12-month period.

In November 1990, the State of Wyoming submitted to the EPA a proposed revision to the SIP. One purpose of the revision was to modify Section 24, PSD. Prior to submission to

the EPA, the WDEQ/AQD held a series of public hearings. During one of the hearings, the WDEQ/AQD presented testimony documenting that the air quality resource had not been diminished during the period from 1980-1989, although coal production increased significantly during that period.

A summary of the historical monitoring data for the years 1980 through 1988 is provided as Table 8. During this period the number of mines producing coal in the Wyoming portion of the Powder River Basin increased from 10 to 16 while coal production escalated from 58.8 million tons to 139.1 million tons. The number of mines monitoring air quality increased from 12 to 16 (Table 8). The number of actual monitoring sites varied from a low in 1980 of 29 to

Table 8. Summary of Air Quality Monitoring in Wyoming's Powder River Basin, 1980-1988

Year	Number of Mines (Producing/ Monitoring)	# Sites	Coal (MMTPY)	OB (MMBCY)	TSP Average of All Geometric Means (ug/m ³)	BTM Geometric Mean TSP (ug/m ³)
1980	10/12	29	58.8	93.2	30.8	28
1981	11/13	34	68.9	108.0	30.4	32
1982	11/15	43	81.4	120.7	23.1	25
1983	13/15	41	88.0	157.2	24.3	30
1984	14/15	44	106.8	166.6	24.3	29
1985	16/15	45	113.8	196.3	24.3	34
1986	16/16	46	114.6	169.6	20.5	28
1987	16/16	45	124.6	180.9	25.6	30
1988	16/16	45	139.1	209.8	29.3	44

Note: Mines include Buckskin, Rawhide, Eagle Butte, Fort Union, Clovis Point, Wyodak, Caballo, Belle Ayr, Caballo Rojo, Cordero, Coal Creek, Jacobs Ranch, Black Thunder, North Antelope/Rochelle, Antelope, and North Rochelle.

a high of 46 in 1986. In 1988 there were 45 operating sites. Some of these sites include more than one sampler, so the number of actual high volume air samplers is greater than the number of monitoring sites.

In an effort to summarize the monitoring data in comparative form, averages of the geometric means from all sites were calculated for each calendar year. The averages ranged from a high of 30.8 ug/m³ in 1980 to a low of 20.5 ug/m³ in 1986. Over 23,000 samples were collected during this period.

Table 8 shows that the average of the geometric means went up during 1987 and 1988.

The cause of this increase is not clear at this time. Speculation is that it was due to mining activity approaching monitoring sites and to dry conditions due to the regional drought. The third quarter of 1988 could have been impacted by emissions from the forest fires in Yellowstone Park.

The rightmost column in Table 8 shows the annual geometric mean TSP concentrations for the Black Thunder Mine. Before the TSP annual standard was replaced by the PM-10 standard, the TSP annual standard was 60 ug/m³. As the table shows, the annual averages are well below this former standard. Assuming that PM-10, which was not monitored during the years shown in Table 8, was about 30 percent of the TSP values, and further assuming that the geometric and arithmetic means are similar, it can be inferred from Table 8 that the BTM has historically been well within the current annual PM-10 standard of 50 ug/m³.

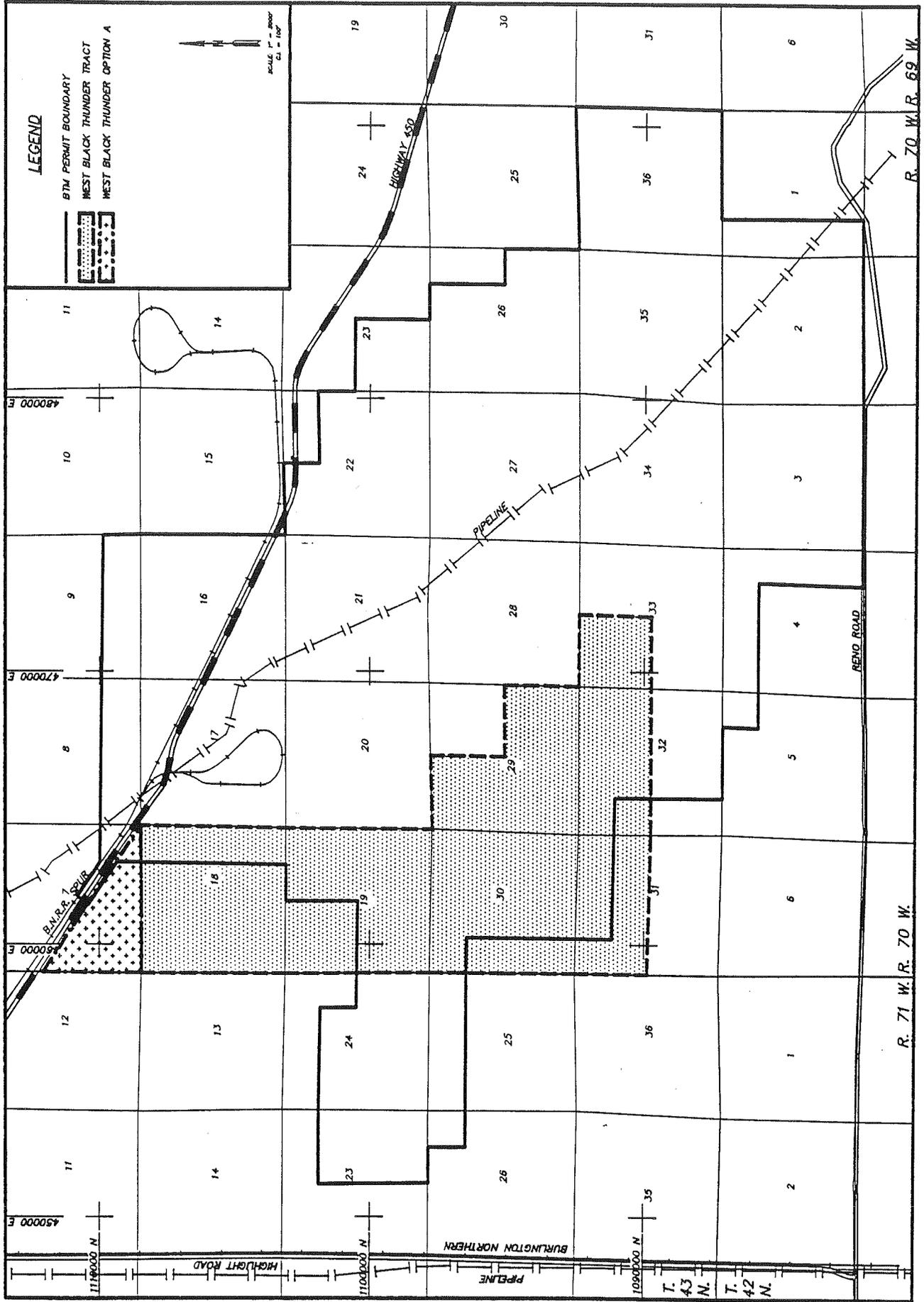
The information presented by the WDEQ/AQD indicates that air quality in the Wyoming portion of the Powder River Basin did not deteriorate while coal production increased nearly 2.5 times in the 1980-1989 period. This is due in part to the conditions attached to air quality permits, which stipulate control measures that must be implemented by the mine operators. These measures include increased sprinkling, use of EPA approved chemicals to control dust, limiting the amount of disturbed area, temporary vegetation of disturbed areas, and contemporaneous reclamation.

Under Option A, which is the preferred alternative of the BLM, the removal of WBT coal will eventually require blasting and mining operations near Highway 450 (in section 7, T43N, R70W). Thus there is a potential for impact to highway travelers if blasting and/or fugitive dust cause visibility impairment or if flyrock approaches the right-of-way. These issues will be addressed in the mine's blasting plan and in the air quality permit which must be obtained from WDEQ/AQD if the WBT lease is issued. In the early to middle 1980s, BTM existed on both sides of Highway 450 (in section 16, T43N, R70W), and used a haul road that passed under the highway, without dust or blasting related problems.

13. Transportation Facilities

Wyoming Highway 450 and a spur of the Burlington Northern Railroad are adjacent to the northeast corner of the proposed lease area. Highway 450 provides access to Wyoming Highway 59 nine miles to the west. Highway 450 was constructed and upgraded during the late 1970s to State of Wyoming standards to better serve as access for the coal industry. The BTM and the Jacobs Ranch Mine funded the initial upgrading of this highway and are currently the major users. The Highlight Road runs north-south about two miles west of the proposed lease area, parallel and adjacent to the Gillette-Douglas rail spur used jointly by the Burlington Northern and Chicago and Northwestern railroads. The Reno County Road parallels the south side of the proposed lease area about 1.5 miles to the south. These transportation facilities are shown on Figure 8.

FIGURE 8. TRANSPORTATION FACILITIES IN VICINITY OF WEST BLACK THUNDER TRACT



14. Socioeconomics

The proposed lease area lies in Campbell County within the Powder River Basin in northeastern Wyoming. Major Campbell County communities include Wright, located approximately thirteen miles to the west of the lease area, adjacent to Highway 59, and Gillette, located approximately 56 miles to the north via Highway 59.

Gillette is the county seat for Campbell County. It is the major trade center and the largest community within the affected area of the proposed coal lease property. It is the community within the region that is most likely to attract new area residents due to its current population level and resulting services and shopping amenities which exceed those of lesser populated communities within commuting distance of the proposed lease area. Gillette had a population of 17,635 in 1990, according to the 1990 Census, relative to a 1990 population for Campbell county of 29,370. Wright is a smaller community, with a population of over 1,200 people, and is home to about 40 percent of the BTM employees. Campbell County ranked sixth in population among counties within the state in 1990. Local planners are projecting Campbell County population to rise to almost 31,000 by 1995.

With a total area of 4,756 square miles, Campbell County's population density was almost 6.2 persons per square mile in 1990, compared to an average of about 4.7 persons per square mile for the state. The 1990 Census placed the state's population at 453,588.

According to the 1990 Census, Campbell County contained 11,538 housing units that year, of which 7,078 were in the town of Gillette. Vacant housing in Gillette is estimated to total about 549 units, excluding boarding and bunk house vacancies (see Table 9). The overall

Table 9. Housing Availability in Gillette, Wyoming, 1990

UNIT	OCCUPANCY NO.	VACANCY NO.	% VACANCY RATE
Single Family (single homes)	3,272	188	6
Single Family Attached (townhouse/duplex)	914	78	9
Multiple Family (rentals)	1,487	201	14
Mobile Homes	882	82	9
Total	6,555	549	8

Source: Gillette Housing Development-Planning, May 17, 1991
 Note: Boarding and bunk house vacancies are unknown.

vacancy rate is about 8 percent. New workers entering the area in response to any growth in the local mining sector would probably find more vacant housing in Gillette than in other

surrounding communities. As a maintenance tract, the WBT lease application would not directly create additional jobs. However, current available housing in the affected area, including Gillette, Wright, and Newcastle, should be sufficient to accommodate over 900 additional workers.

Campbell County's economy is based largely upon coal mining, petroleum development and extraction, energy production (specifically power generation), and agriculture. Campbell County's 1989 mineral assessment equalled \$1.1 billion. The 1989 state total was \$3.44 billion. Coal valuation in 1989 totaled \$1.17 billion for the state and \$744.29 million for Campbell County. Thus, Campbell County represented about 32 percent of the state's total mineral valuation, and almost 64 percent of the state's total coal valuation.

The 1989 oil production in the county was valued at over \$428.84 million, or about 26 percent of the state's output of almost \$1.66 billion. The 1989 gas output in Campbell County was valued at almost \$26.11 million, which is about 3.4 percent of the \$771.21 million valuation for the entire state's 1989 production.

Campbell County produced about 136 million tons of coal in 1988, 144 million tons in 1989, and 155 million tons in 1990. This output equaled about 83 percent to 84 percent of the state's total coal output in those years. State output rose from 164 million tons in 1988 to 184 million tons in 1990, making Wyoming the largest coal producer among the states. Most of the state's increase occurred in the Powder River Basin. The BTM produced over 24.8 million tons of coal in 1988, about 29.5 million tons in 1989, and about 28.5 million tons of coal in 1990. Coal production and forecasts for selected years are shown on Table 10. For the foreseeable future Wyoming coal production is expected to increase at about 4.4 percent annually, while coal production in Wyoming's Powder River Basin is expected to increase at closer to 5 percent per year.

Table 10. Historic and Projected Coal Production for Wyoming and Campbell County

Year	Wyoming Million Tons	Percent Increase	Campbell Co. Million Tons	Percent Increase
1988	163.6	---	135.7	---
1989	171.1	4.6	143.8	6.0
1990	184.0	7.5	154.7	7.6
1991	187.6	2.0	157.4	1.8
1992	196.4	4.7	164.8	4.7
1993	205.0	4.4	172.4	4.6
1994	214.0	4.4	181.1	5.1
1995	223.4	4.4	190.1	5.0

Source: Wyoming Geo-Notes No. 30, Issue of May, 1991, Table 11, p. 20.

There were 2,100 producing oil/gas wells in Campbell County in 1989. Oil production in Campbell County totaled between 25 million and 25.5 million barrels (Bbls) in 1988 and 1989. Gas production in the county totaled over 22.4 million cubic feet (MMCF) in 1988 and over 19.8 MMCF in 1989. Estimates place the County's gas production at 28 MMCF in 1990. By comparison, the state produced a total of about 111.21 million Bbls of oil in 1988 and 100.35 million Bbls in 1989. It produced over 471.36 MMCF of gas in 1988 and 621.50 MMCF in 1989.

Employment in Wyoming's coal mining industry totaled 4,809 in 1988, 4,897 in 1989 and is currently about 4,700 (Wyoming Department of Employment, June 1991). The Office of the State Inspector of Mines indicates that Wyoming's coal mining sector employed 4,623 persons in 1990 of which Campbell County employed 2,590. The latest county employment data specified in this report is for 1988 and it indicates that the total mining sector of Campbell county employed about 4,666 full and part-time employees in 1988. The BTM employed 464 persons in 1988, 495 in 1989 (Geological Survey of Wyoming, Wyoming Geo-Notes No. 26) and 488 employees in 1990 (Wyoming Coal Information Committee, 1991).

The average price of coal sold in Campbell County, Wyoming declined from a peak of \$9.88 per ton FOB mine site in 1982 to only \$6.92 per ton in 1989 (U.S. Department of Energy, Energy Information Administration, 1990). The average coal price reflects a composite of historic contract prices that have escalated over time, new contract sales and open market (spot) coal sales. In the mid 1980s spot coal prices dropped to levels as low as \$3.00 per ton. More recently, spot coal prices have ranged from \$3.70 to \$4.60 per ton for 8,400 to 8,800 Btu per pound coal at the mine mouth (McGraw-Hill, 1991). The BTM has not been impacted by this lowering of prices or weakened demand because of higher-quality coal and its ability to ship coal over competing rail lines.

The Wyoming Income and Employment Report for November 1990 shows that the County's agricultural sector employed between 600 and 750 in 1988. Total employment in the County in 1988 was 17,242. Labor force data for selected years are presented in Table 11. Seasonally adjusted unemployment in Campbell County in April 1991 was 6.4 percent, down from 7.4 percent in April 1990. This compares to statewide figures of 5.2 and 5.4 percent for April of 1991 and 1990, respectively. In April of 1991 there were 1,055 persons on the unemployment rolls in Campbell County (Wyoming Department of Employment, June 1991).

Personal income in Campbell County totaled almost \$473.36 million in 1987 and \$489.57 million in 1988. This represented a 6.06 percent decrease from 1986 to 1987 and a 3.42 percent increase from 1987 to 1988. State personal income for those years totaled about \$6.28 billion and \$6.58 billion, respectively, which is a 2.70 percent decrease from 1986 to 1987 and a 4.78 percent increase from 1987 to 1988. In 1989, state personal income rose to over \$6.88 billion, a 4.64 percent increase over 1988. (The percentages are calculated on the non-rounded database by the State of Wyoming). In Campbell County, income earned from all mining (including oil extraction) totaled over \$193.70 million in 1987 and almost \$204.75 million in 1988. Earnings

in the County's agricultural sector were between \$5 million and \$6 million in both 1987 and 1988.

Table 11. Labor Force Data for Selected Years for Wyoming, Campbell and Weston Counties

YEAR	WYOMING no.	CAMPBELL no.	WESTON no.
1980	235,000 1/	14,430 1/	3,242 1/
1985	250,000 1/	18,592 1/	3,532 1/
1990	246,000 2/	16,504 2/	3,299 2/

Sources:
¹ Employment Security Commission of Wy., "Wyoming Labor Force", Research & Analysis, 3/1989, Casper
² Wyoming Department of Employment, "Wyoming 1990 LAUS Estimates", April 2, 1990 Casper

By comparison, earnings by place of work for the state totaled almost \$4.59 billion in 1987, \$4.76 billion in 1988, and \$4.87 billion in 1989. Earnings from coal mining amounted to about \$238.57 million in 1987, \$251.02 million in 1988, and \$257.15 million in 1989. Earned income from oil and gas extraction state wide was about \$319.17 million in 1987, \$333.72 million in 1988, and \$318.52 million in 1989. The state's agricultural sector produced earnings of over \$100 million in 1987, over \$124 million in 1988, and between \$66 million and \$67 million in 1989.

The state's per capita income averaged \$12,868 in 1987 and \$13,641 in 1988. In these same years, Campbell County per capita income averaged \$14,123 and \$14,927, respectively.

Table 12 shows a summary of total disbursements by Campbell County, the City of Gillette, and the Campbell County school districts for selected years. In 1990, School District No.1 in Gillette employed about 439 full time classroom teachers, and had a fall enrollment of 7,759 pupils, which resulted in a pupil/teacher ratio of 17.67. According to the Wyoming Department of Education, this pupil/teacher ratio is good. The state is striving to have average pupil/teacher ratios at about 15:1 to 16:1. The Education Department also indicated that Gillette has the finances to accommodate additional students that might result from mine expansion in the area. This district had fifteen elementary, five junior high and middle schools, and three high schools in 1990.

Weston County lies to the east of the lease area, and its county seat of Newcastle is located in a commuting distance of about 55 miles east of the lease area. Newcastle has a population of about 3,003. According to Weston County Development in Newcastle, this community has 3,641 housing units of which 373 are vacant (see Table 13).

Weston County has about 8,388 people and ranks 15th in the state in terms of population

(out of 23 counties). It has 3.48 persons per square mile. Weston County's economy is based on coal, livestock, and the railroad. It had oil booms in the 1920s and 1950s and another upsurge in the 1970s, but the drop in oil prices in the 1980s resulted in an economic downturn and out-migration of population in the late 1980s.

Table 12. Local Disbursements for Campbell County and Gillette for Selected Years 1/

Years	Campbell County 1000 \$	Gillette 1000 \$	School District 1000 \$
1980	---	15,721.0	35,885.2
1985	---	30,415.0	62,261.0
1990	158,639.9	29,717.0	59,715.9
1991	133,973.4	33,000.0	62,700.0

¹ Figures for 1980, 1985, and 1990 are actual expenditures as reported by local entities. Figures include debt servicing.

Source: BLM, June 1991, Jacobs Ranch Federal Coal Lease Application Environmental Assessment.

Table 13. Housing Availability In Newcastle, Wyoming, 1990

UNIT	OCCUPANCY NO.	VACANCY NO.	% VACANCY RATE
Single Family (single homes)	2,376	144	6
Single Family Attached (townhouse/duplex)	2	0	0
Multiple Family (rentals)	481	109	23
Mobile Homes	739	108	15
Senior Housing	43	12	28
Total	3,641	373	10

Source: Jan. 1991, Wyoming Division Of Economic and Community Development, and Weston County Development, Newcastle, Wy., Donna Bunch, Interview 5/22/91.

In 1989, oil production in Weston County totaled 1.41 million Bbls from 1,592 wells. This represented about 1.6 percent of the state's total oil production. The value of this output was estimated at \$26.7 million. Gas production that year totaled 1.5 MMCF, valued at \$2.9 million. The total value of all minerals produced in 1989 was \$30.2 million.

During 1990, Weston County employment averaged 3,155 with an unemployment rate of 5 percent to 6 percent. In April 1991 the Weston County unemployment rate was 6.0 percent, up from 5.5 percent in April 1990. There were 198 persons on the Weston County

unemployment rolls in April 1991 (Wyoming Department of Employment, June 1991). In 1988, total earned income within the county amounted to \$38.2 million, with mining as the leading industry followed by services and transportation/utilities. In 1987, per capita personal income totaled \$12,413, rising to \$13,917 in 1988.

Weston County has a total of seven schools; four are located in Newcastle and three in Upton. There are about 109 full time teachers employed by the county (76 are in Newcastle). The pupil/teacher ratio is 14.44 in Newcastle and 11.45 in Upton. This would indicate that the schools are well within the pupil/teacher ratio targets of the State of Wyoming.

The area being considered in this EA, like many other areas of the state, suffered from the decline in energy prices during the 1980s; therefore, it is not expanding as rapidly as had been projected earlier by various state planners. However, the preceding information would indicate that Campbell County experienced an upward movement in mining activity and related earnings in the late 1980s, and that both Campbell and Weston Counties were above the state average in per capita income. Any increase in the demand for the area's energy-related resources would further the area's economic growth, with most of this growth likely to accrue to Gillette due to its larger size and larger amount and variety of available services.

IV. ENVIRONMENTAL IMPACTS

A. Impacts Of The Proposed Action

The proposed action, Alternative 1 is to issue the lease as applied for, that is, as a maintenance tract under the lease-by-application regulations. Possible modifications to the proposed action include altering the tract boundary to include a small wedge of land in Section 7, south of Highway 450 (Option A), and dividing the tract into two smaller tracts if it is determined that this action would make the coal more attractive to potential bidders and thus increase lease sale revenues to the federal government (Option B). Alternative 1, the proposed action, with Option A included is the preferred alternative of the BLM.

This section describes the environmental impacts that would result if the WBT tract were leased to TBCC as a maintenance tract for the adjacent BTM (Alternative 1). Discussions of changes in the environmental impacts of the proposed action as a result of adopting Option A or Option B are included in this discussion. Impacts are quantified for each discipline addressed in Section III of this report. The following section (IV. B.) addresses impacts of alternatives, primarily by comparison to the impacts of the proposed action. Subsequent sections describe mitigation measures that would reduce or eliminate adverse impacts, residual impacts that might remain in spite of mitigation measures, and cumulative impacts of the proposed action and alternatives.

1. Geology and Topography

Surface coal mining radically alters the geology of the affected land. Overburden is drilled, blasted, and removed from atop the coal, either by trucks and shovels or by draglines. Both mining methods are employed at the BTM. The overburden is either stockpiled or replaced directly into a mined-out area. Coal is blasted and removed by trucks and shovels. A coal recovery efficiency of about 90 to 95 percent is typical for Powder River Basin mines, based on information provided in numerous mine permit documents on file with WDEQ/LQD. The small percentage of coal not taken may be left intentionally, such as ashy or otherwise poor-quality coal or coal which is left as a safety measure, or it may be lost by spillage from equipment or not loaded during the normal mining process.

The replaced overburden, or spoil, is physically different from the in-place overburden. As described previously, the Wasatch Formation which comprises the overburden consists primarily of discontinuous lenticular sandstone beds and sand channels surrounded by siltstone and shale. The replaced spoil is a mixture of these materials, with the physical characteristics (bulk density, porosity, hydraulic conductivity, etc) of the spoil being a function of mining methods and relative percentages of sand and finer-grained sediments in the overburden.

Overburden volumes in place are generally expressed in bank cubic yards (bcy), while spoil volumes are expressed in loose cubic yards (lcy). The ratio between lcy and bcy is termed the swell factor. At the BTM, truck-shovel spoils have a design swell factor of 13.5 percent and

dragline spoils have a design swell factor of 20 percent (TBCC, 1990, Book No. 17). The dragline generally removes the 100 feet of overburden directly above the coal, while the rest of the overburden is mined with trucks and shovels. The overall swell factor depends not only on overburden lithology but on relative amounts of dragline versus truck/shovel spoils.

Within the existing mine area, approximately 6,390 acres will be affected by actual mining and coal removal. The remainder of the 8,344 acres to be affected over the mine life are subject to surface disturbance such as construction of roads and diversions and mining of scoria for road surfacing material. Because of contemporaneous reclamation efforts, not all of this area would be disturbed at one time. Mining of the WBT tract as proposed as a maintenance tract would add about 3,225 acres to the total area actually mined and another 500 or so acres around the lease boundary disturbed by overburden benching, topsoil removal, and possibly highwall slope reduction during reclamation. Option A would add approximately 280 acres in Section 7 south of Highway 450 to the mine area, with possibly 120 acres of additional surface disturbance along the west and north boundaries. Option B, leasing the WBT tract in two parcels, would not in itself change the area affected by mining. Thus the area subject to coal removal ranges from about 6,390 acres in the current mine area to about 9,615 acres if the WBT tract is leased and mined as applied for to 9,895 acres with Option A. Total surface disturbance would range from 8,344 acres proposed in the current plan to 12,070 acres under the proposed action to 12,470 with Option A.

The topography of the lease area is subject to considerable change during the mining process. Due to the thickness of the coal seam, the average elevation of the mined area would be lowered, even after allowing for overburden swelling. A typical average overburden thickness for mines in the Powder River Basin is about 150 feet. Coal thicknesses vary, but an average mineable thickness is approximately 60 feet. Thus removal of the coal and swelling of the overburden by 15 percent results in a change in average elevation of :

$$150(0.15) - 60 = -37.5 \text{ feet.}$$

Overburden thickness generally increases as the coal dips westward, away from the outcrop, and the ratio of overburden to coal may be thicker in the WBT tract than in the illustration above, meaning that the average drop in elevation may be less than 37.5 feet.

Certain habitat features of the premining landscape are directly related to topography (see Section III.B.3 and B.6 of this report). These include closed depressions which contain intermittent lakes, or playas, in their bottoms and dissected stream channels which are often lined with cut banks and rock outcrops. As described in the mitigation section, these features would be simulated in the postmining landscape.

2. Water Resources

Surface coal mining has several impacts on local hydrology, including both the surface and ground-water systems. These impacts are acknowledged by both mine operators and regulatory agencies, and the analysis and mitigation of hydrologic impacts receives considerable

attention in the preparation and review of mining permit application documents.

Ground-water impacts generally include the following:

1. Removal of the coal aquifer and any overburden aquifers within the mine area, and replacement of these aquifers with spoil material.
2. A temporary lowering of static water levels in the aquifers around the mine due to dewatering associated with removal of these aquifers within the mine boundaries.
3. A temporary lowering of static water levels in the sub-coal Fort Union Formation if the mines pump from this formation to provide water for sanitary and industrial (wash-down, etc.) uses. Most mines in the Powder River Basin, including BTM, have water-supply wells completed in the sub-coal Fort Union Formation.

Other ground-water impacts, which may or may not occur or which may occur only at specific locations, include off-site changes in water quality and changes in recharge-discharge conditions and ground-water flow patterns.

Surface-water impacts generally include the following:

1. Disruption of the surface drainage system (channels and tributaries) during mining, requiring replacement of these systems during reclamation.
2. Changes in streamflow patterns during mining caused by the regulatory requirement to store runoff and settle out solids; by construction of flood control reservoirs or diversion systems needed to prevent unacceptable levels of runoff from entering the pit; and by discharges to streams of pit inflows or other sources of water in excess of the mines' water requirements.
3. Possible changes in runoff rates due to changes in precipitation infiltration rates.
4. Possible changes in surface-water quality.

a. Ground Water

As described in Section IV. A.1., the physical and chemical characteristics of the spoil material are dependent upon mining methods and overburden lithology. Research in other coal-mining areas in the northern Great Plains indicates that hydraulic conductivity in the reclaimed spoil would be large enough to consider the material an aquifer (Groenewold, 1979). The final hydraulic conductivity of the spoil aquifer would probably approximate the geometric mean

values of hydraulic conductivity for the undisturbed Wasatch aquifer (0.2 ft/day) and the Wyodak coal aquifer (0.8 ft/day) (Martin, et al., 1988, p. 23). Given the expected final saturated thickness, the spoil aquifer could supply water of adequate quantity for supply of the small yields needed for stock and domestic wells. This hydraulic conductivity could also be sufficient for the spoil aquifer to support flow patterns that are similar to premining patterns, allowing for the fact that one aquifer (spoil) would replace two aquifer systems (coal and overburden) within the mine areas.

The following discussion of recharge, movement, and discharge of water in the spoil aquifer is excerpted from the Powder River Basin Cumulative Hydrologic Impact Assessment (CHIA) prepared by the USGS (Martin, et al., 1988):

The potential for recharge to the backfilled spoil would be greater than in areas not disturbed by mining. The natural bedding will be destroyed, creating a more isotropic condition in the spoil, resulting in generally greater vertical permeability than exists in undisturbed areas. The infiltration capacity of the backfilled and reclaimed spoil will be greater than that of the undisturbed Wasatch aquifer and Wyodak coal aquifer. However, the infiltration rate for reclaimed soils is less than that for natural soils due to the lack of root structure and other paths for vertical movement of water. After several years, infiltration rates for reclaimed soils will increase to approximately the same rates as for undisturbed soils. As infiltration rates increase to approximate premining conditions, ground-water recharge rates also will increase to approximate premining conditions.

Although the recharge potential of the reclaimed mine areas will increase, the actual recharge rate after reclamation probably will approximate or be somewhat greater than premining recharge. Actual recharge will depend on how well the surface contours are restored. A flatter average slope of the reclaimed land would increase the potential recharge by decreasing the rate of runoff from reclaimed areas. Recharge will increase locally where water is allowed to pond in surface impoundments. Also, some increase in recharge along re-constructed channels probably will occur during the infrequent periods of surface runoff.

Postmining recharge rates and mechanisms will not change in areas where lateral movement of ground water from adjacent clinker is a major source of recharge. This is because, in general, the clinker will not be disturbed by mining operations. After mining and reclamation have been completed, water will move laterally from clinker to the spoil aquifer.

Recharge to the spoil aquifer will be from infiltration of precipitation, lateral flow from the undisturbed clinker and the Wasatch aquifer and Wyodak coal aquifer, and leakage from surface-water impoundments and stream channels. Estimates of the time required for the ground-water system to re-establish equilibrium varies from a few tens of years to hundreds of years. The anticipated potentiometric surface of the spoil aquifer will resemble a composite of the premining potentiometric surfaces in the Wasatch aquifer and Wyodak coal aquifer. After equilibrium is re-established, ground-water flow patterns will approximate premining conditions. Discharge from the spoil aquifer will flow into the undisturbed Wasatch aquifer and Wyodak coal aquifer to the west (regional flow) or to reclaimed stream channels (local flow).

To date, six monitor wells, including one drilled in late 1991, have been completed in replaced spoils at the BTM. The most recent water-level data available for five of these wells are presented in Appendix 7.1 and 7.2 of the 1990 BTM Annual Report. Four of these wells

have encountered water, and one has remained dry since its construction in 1987. Water levels in the wells which encountered water range from about 50 to 180 feet below the reclaimed surface. Saturated thickness of the spoil aquifer at these wells currently ranges from 0 to over 30 feet.

In a regional study of the cumulative impacts of coal mining, the median concentrations of dissolved solids and sulfates were found to be larger in water from spoil aquifers than in water from either the Wasatch overburden or the coal aquifer. This is expected because blasting and movement of the overburden materials exposes more surface area to water, increasing dissolution of soluble materials, particularly when the spoil materials were situated above the saturated zone in the premining environment. On the basis of studies done in North Dakota, it was estimated that at least one pore volume of water must leach the spoil before the dissolved-solids concentration in the water would be similar to the premining dissolved-solids concentration (Houghton, et al., 1987). The time required for one pore volume of water to pass through the spoil aquifer is greater than the time required for the postmining ground-water system to re-establish equilibrium.

Dissolved-solids concentrations in the backfill wells at BTM range from about 1,400 mg/L to over 4,500 mg/L, which is within the range of premining ground-water quality samples (TBCC, 1990 Annual Report to WDEQ/LQD, Appendix 7.3).

Water-supply wells within the mine area would experience water-level declines as they are approached by the pit, and ultimately would be removed by mining. Water-supply wells completed in the coal and possibly wells in the overburden outside but in close proximity to the mine area would experience reductions in water levels. To monitor the effects of mining on water levels, TBCC maintains 18 coal, 13 overburden, and 11 alluvial monitoring wells.

TBCC has conducted ground-water modeling, and the results are reported in Appendix II.F. 2.6, Part 1 of the 1990 permit update on file with WDEQ/LQD. Drawdowns in the coal aquifer, as modeled, extend much further beyond the mine boundaries than do those in the overburden. WDEQ/LQD policy is to have the mining companies determine the extent of the five foot drawdown contour. This contour extends about six miles north, about five miles west, and about two miles south of the current permit boundary. Drawdowns do not extend to the east because the mine is located on the coal outcrop line. The WBT tract is within an area where drawdowns will generally exceed 40 feet. There is some cumulative effect to the north, where drawdowns from the Black Thunder and Jacobs Ranch mines intersect, and to the south where drawdowns from the Black Thunder and North Rochelle mines intersect.

A review of water-level data from BTM coal monitoring wells BTR-7, BTR-28 and BTR-31, which are on the WBT tract (see Figure 3), for the years 1984-1989 shows only short-term declines and a net increase in water levels for two of these wells. Well BTR-7 showed an increase in water level of 11 feet, and well BTR-28 showed an increase of 18 feet over this period. A net decline of 6 feet was measured at BTR-31.

During the permitting process which would be required to include the WBT tract in the BTM permit area, the drawdown study would be reassessed using data from the WBT tract and incorporating a new mine plan. At this time it can be assumed that the extent and magnitude of the drawdowns would be shifted westward by about one mile as mining extends one mile west through the WBT tract. For the proposed action and Option B, northward and southward extents of coal removal would not be materially changed by the mining of the WBT tract, and therefore the maximum northward and southward extents of drawdown should not change. There could be a small northward shift with Option A, as it includes coal north of the current lease line.

A total of thirteen water-supply wells have been identified as being impacted by BTM. Impacts to these wells will range from removal by mining to minor drawdowns. Two of these wells are located on the WBT tract.

A more regional study of drawdown impacts was conducted by the USGS in their CHIA of the Powder River Basin (Martin, et al., 1988). This study showed that there are about 3,000 wells in the area subject to impact by current and anticipated mining in Wyoming's Powder River Basin. Of these, about 1,200 wells are outside the actual mine areas (i.e., will not be removed by mining). About 1,000 of these supply water for domestic or livestock uses, and about 200 supply water for other uses. The remaining 1,800 wells are used by coal-mining companies: about 1,700 wells are monitor wells only, and the other 100 are used for water supply and/or dewatering at mine sites.

Of the 1,200 water-supply wells subject to impact, about 580 are completed in the Wasatch aquifer, about 100 in the Wyodak coal aquifer, and about 280 in strata below the coal. The remainder have unknown completion data.

Wells in the Wasatch were considered to be impacted by drawdowns only if they were within 2,000 feet of a mine pit (Martin, et al., 1988, p. 29). However, water-supply wells completed in the coal may be affected as far away as eight miles from mine pits, although at this distance the effects will be minimal. Drawdowns extend farther in the coal because the coal is a confined aquifer and because it is areally extensive, whereas the Wasatch aquifers are generally unconfined and discontinuous.

Water-level declines in the sub-coal Fort Union Formation have been documented in the Gillette area. According to Crist (1991), pumpage for municipal use by Gillette and for public supply by the subdivisions around Gillette is the principal cause of water-level declines in the upper Fort Union measured in wells in the immediate vicinity of Gillette. Most of the water-level declines in the sub-coal Fort Union wells occur within one mile of the pumped wells (M.A. Crist, in Martin, et al., 1988, p. 30). Since the mine facilities are always separated by distances of a mile or more, there is little interference between mine supply wells.

In response to concerns voiced by regulatory personnel, several mines have conducted impact studies of the sub-coal Fort Union Formation. The OSM commissioned a cumulative impact study of the sub-coal Fort Union Formation to study the effects of mine facility wells on

this aquifer unit (McIntosh, et al., 1984). Conclusions from all these studies are similar and may be summarized as follows:

1. Because of the discontinuous nature of the sands in this formation, and because most large-yield wells are completed in several different sands, it is difficult to correlate completion intervals between wells.
2. In the Gillette area, water levels in this aquifer are probably declining because the city of Gillette and several subdivisions are utilizing water from this formation (Crist, 1991). (Note: Gillette is using this water as a back-up source at this time.)
3. Because large saturated thicknesses are available in this aquifer unit, generally 500 feet or more, drawdowns of 100 to 200 feet in the vicinity of a pumped well would not dewater the aquifer.

There would be no direct impact to the Fort Union aquifers near Gillette as a result of leasing the proposed WBT tract, due to the distance from the Black Thunder Mine to the city of Gillette (approximately 40 miles) and the discontinuous nature of the sand lenses in the Tullock.

There would not be significant impact to the water supply of the city of Wright as a result of leasing the WBT tract. According to the State Engineer's Office, the only permitted wells drilled below 1000 feet in a 100 square mile area surrounding Wright are four wells permitted to the city of Wright (Stockdale, State Engineer's Office, 1992). As discussed above, Crist (in Martin, et al., 1988) indicated most of the water level declines in the sub-coal Fort Union wells occur within one mile of the pumped wells.

In the vicinity of the BTM, the recharge zone (outcrop area) for the subcoal Fort Union extends eastward approximately 20 miles from the east edge of the lease boundary (BXG, 1983). About half of this distance is the Tongue River/Lebo outcrop, and half is the outcrop of the Tullock member. Recharge from this outcrop tends to flow downdip, or to the west and north, under the area being mined. The BTM lease boundary is about five miles long in the north-south direction, so the Tullock member recharge area in the vicinity of the BTM would be approximately 50 square miles in size (5 miles north-south by 10 miles east-west). Using a value of .1 inch per year of recharge over this outcrop (McIntosh, 1984), the recharge area would contribute around 90 million gallons annually to the Tullock beneath the mine. The current annual BTM usage of water from the Tullock member is about 55 million gallons, which is less than the expected annual recharge to the Tullock in the vicinity of the mine.

If the WBT tract is mined as proposed under the proposed action or Option A, there would probably be no need for additional sub-coal Fort Union wells since no new facilities would be required. In the event that the proposed acreage was sold to two separate operators

under Option B, additional facilities could be required, which could result in a need for additional deep water wells.

Ground-water quality in areas surrounding the mines is not impacted during mining. While the pits are open, ground-water flow directions are toward the pit, and there is no mechanism for contaminants to migrate off-site, even if contaminants were introduced into the ground water.

After mining, under all three options, water levels would begin to recover, and eventually an equilibrium flow pattern would develop. Water from the spoil aquifer would enter the adjacent, unmined coal. This would result in increased dissolved-solids concentrations in the coal aquifer water initially, but since there is a finite quantity of soluble salt in the spoil material this increase would be temporary. Martin, et al.(1988) point out that, in general, current and future water from the spoil aquifers will meet state standards for livestock, which is the current major use of water from the coal and overlying Wasatch aquifers. This conclusion was based on 336 chemical analyses of samples collected from 45 wells completed in spoil aquifers at ten existing mines. The BTM was one of the mines included in that analysis. As noted previously, dissolved-solids concentrations in the backfill wells at BTM range from about 1,400 mg/L to over 4,500 mg/L, which is within the range of premining ground-water quality samples (TBCC, 1990 Annual Report to WDEQ/LQD, Appendix 7.3). Since the water in the spoil aquifer is currently within the range of the premining ground water quality in this area, there should not be a significant impact to the water quality in the adjacent unmined coal when the water from the spoil pile enters it.

Martin, et al., 1988, also point out that column leach tests indicate that the elevated levels of dissolved solids caused by coal mining will decrease over time. As soluble salts continue to leach from the spoil material, future postmining water entering the adjacent coal aquifer should decrease in dissolved-solids concentration until a postmining equilibrium condition is attained (Martin, et al., 1988 p. 92).

Clinker would be the major recharge source for the spoil aquifer, just as it is for the coal. Although some clinker is mined for road surfacing material, saturated clinker is not generally mined since abundant clinker exists above the water table and does not present the mining problems that would result from mining saturated clinker.

b. Surface Water

The incremental impacts to the surface drainage system caused by mining the WBT tract would be minimal. The two main streams on the property, Little Thunder Creek and North Prong Little Thunder Creek, have already been mined through. Both streams are now conveyed around active mining areas in diversion channels. Plans for the restoration of these streams have been submitted to and approved by WDEQ/LQD, and portions of both streams have already been partially restored. These restoration plans are designed to provide channel and drainage-basin erosional stability comparable to premining stability.

Impacts to downstream water rights would be minimal, primarily because there are few downstream rights and these are located well downstream from the mine. Considerable intervening drainage area provides most of the flows to satisfy these rights.

A check of the records in the State Engineer's Office shows eleven downstream water rights, three on Little Thunder Creek and eight on Black Thunder Creek. About 78 percent of the drainage area of Little Thunder Creek is below the mine boundary and above the diversion locations for the water rights on Little Thunder Creek. Because runoff is proportional to drainage area, only about 22 percent of the flow of Little Thunder Creek is subject to alteration by the BTM. Only 10 percent of the drainage area above the water rights on Black Thunder Creek is above the BTM. Normal seasonal and annual fluctuation in streamflow would mask any effects the mine has on these downstream water rights.

Some studies indicate that infiltration rates are initially smaller on reclaimed lands than on premining lands. A reduction of up to 29 percent has been found, with this reduction declining over time until the postmining infiltration rates recover to premining levels (Martin, et al., 1988, p. 106)

Since runoff and infiltration rates have an inverse relationship, a reduction in infiltration rates could cause an increase in runoff and, hence, streamflows. Assuming that the runoff from reclaimed areas is 29 percent greater than that from premining areas (based on this change in infiltration rates noted above), USGS determined that major streams in the Powder River Basin would see runoff increases ranging from 0.4 percent for the Cheyenne River to 4.3 percent for Coal Creek. Little Thunder Creek would see a 2.9 percent increase in runoff (Martin, et al., 1988, p. 109).

Surface water quality should not be significantly affected by mining, based on studies conducted by the USGS for the Belle Fourche River Basin (Bloyd, et al., 1986, pp. 33-41). Sediment yield should not increase in area streams. Although reclaimed soils may be more erosive for the first few years after reclamation, the larger sediment production would probably not be delivered to area streams due to sediment deposition as a result of flatter slopes on reclaimed lands and sediment trapping by mandated sedimentation ponds.

c. Alluvial Valley Floors

Impacts to designated alluvial valley floors (AVFs) are generally not permitted unless the AVF is insignificant to farming or unless the permit to affect the AVF was issued prior to the effective date of SMCRA. In general, AVF impacts can include several of the ground and surface-water impacts listed above. Alluvial aquifers can be subject to water-table drawdowns, channels subject to changes in flow patterns, and the interaction between surface water and ground water can be altered. The portion of Little Thunder Creek that crosses the WBT tract is already in the BTM permit area and is not part of the designated AVF.

d. Wetlands

Western Water Consultants found a total of 107.9 acres within the BTM study area, including the WBT tract, which met the definition of jurisdictional wetlands. Of this 107.9 acre total, 6.15 acres (4 sites) were comprised of playas, 21.38 acres (3 sites) were associated with man-made reservoirs, and 80.37 acres (9 sites) were within or immediately adjacent to stream channels. Mitigation in accordance with the prevailing USCE regulations will be addressed as part of future mining permits.

3. Soils

The topsoil, like the overburden, is removed and replaced during the mining and reclamation process. The postmining topsoil is therefore a composite of premining soils. However, there are important differences. Premining soils occur in mappable units, or soil series, which are distinguishable by their physical and chemical characteristics, depths, locations in the landscape, and other factors. Prior to mining, the operator is required to map the soils, test them for physical and chemical suitability to support plant growth, and provide a plan for their salvage and replacement.

The postmining soils are a more homogenous mixture than the premining soils and are replaced at a more uniform depth. On average, the postmining soils would be superior in quality to premining soils since soil material determined to be unsuitable, because of physical or chemical limitations, is not salvaged and replaced. The average topsoil replacement depth at the current BTM is about two feet. Since soils in the WBT tract are similar to those in the current mine area, the average replacement depth for the entire mine area including the WBT tract, with or without Option A, should not change significantly.

Infiltration rates of soils may be altered by the salvage and replacement activities. However, differences between infiltration rates for natural and replaced soils may be masked by the variability of infiltration rates among soils and by inherent inaccuracies in measuring infiltration rates. Average infiltration rates would probably be smaller soon after reclamation is completed, but over time, as the postmining vegetation root system develops and natural weathering action affects the soil structure, infiltration rates should trend toward premining levels (Martin, et al., 1988).

It is estimated that about 3,725 acres of soil resources would be disturbed in the proposed WBT lease area and adjacent disturbance areas under the proposed action, including about 144 acres of hydric soils in playas. An additional 400 acres would be disturbed under Option A.

Improper disturbance to soils could cause numerous types of impacts associated with alteration of existing soil characteristics and properties. Potential impacts to soil resources as a result of mining could include changes in soil structure, texture, organic matter content, infiltration rate, permeability, water-holding capacity, nutrient level, soil microorganism composition, and soil productivity. Mining could expose lower soils or overburden material

which may contain chemical constituents, such as selenium, at levels which could be harmful to plants and animals.

Stockpiling soil material could degrade biological, chemical, and physical properties. Stockpiling could decrease organic matter content, disrupt nutrient cycles, increase bulk density, upset the carbon-nitrogen ratio and negatively affect the mycorrhizal response of stored soil material (USFS, 1984).

The exposure, compaction, and stockpiling of salvaged soil material can increase potential for soil loss from wind and water erosion until the soil is revegetated. Increases in surface runoff can cause increased soil erosion and subsequent sedimentation into drainage channels or impoundments. Soil loss can be modeled for a range of conditions through use of the Revised Universal Soil Loss Equation (USDA-ARS, 1991). Erosion hazard is greatly reduced through successful establishment of reclamation measures.

Potential impacts to topsoil resources are short-term and not significant as evidenced by reclamation efforts on reclaimed areas of the adjacent BTM for similar soils. No significant site-specific or cumulative impacts have been encountered on the currently active BTM to date and none are foreseen on the WBT tract. No prime farmland or alluvial valley floors exist within the proposed WBT lease area, and therefore none would be disturbed. Ponds, impoundments, and other drainage features have been reconstructed during BTM reclamation, and similar reclamation techniques would be used on the WBT tract. No detrimental long-term impacts to wetland resources are foreseen based on the experience on the currently active BTM.

There has recently been some general concern expressed about levels of selenium in coal mine overburden and backfill. During fifteen years of actual mining experience at the BTM, there have been no problems concerning selenium.

Several years ago, the WDEQ/LQD revised their guidelines for handling seleniferous materials based on the results of a laboratory study. At this time, the chemistry of selenium in Powder River Basin soils is being studied to see if the current guidelines can reasonably be applied for this area. The Wyoming Mining Association and the WDEQ/LQD have embarked on a comprehensive research program, in which the TBCC is involved, to address issues such as:

- appropriate analytical techniques for obtaining reproducible selenium measurements in soils;
- levels of selenium in vegetation on reclaimed areas and undisturbed ground;
- the interrelationship between selenium in soils and vegetation;
- the characteristics of selenium uptake by vegetation; and

- the potential for contribution of selenium to the groundwater or surface water resources from backfill areas.

The intent of this research is the potential promulgation, if appropriate, of rules for handling seleniferous soils to minimize or avoid long-term impacts to the environment. To date, impacts related to selenium have not been detected, and this research will help assure future selenium problems are not encountered.

4. Vegetation

Vegetation on the WBT tract is similar to that which occurred prior to mining on the current mine permit area. These vegetation types are common throughout the region. Through the 1990 annual reporting period, a total of 4,410 acres had been disturbed on the BTM (TBCC, October 1990, p. 3.9). Of this, about 1,350 acres had been permanently reclaimed as of spring, 1991 (Bob Moore, personal communication, June 24, 1991). Since 1981, revegetation of mined lands at the BTM has been a continuous process. Revegetation success at the BTM has been monitored on an on-going basis since 1985. Data from this monitoring suggests that the reclaimed lands have cover and productivity equal to or greater than the native mixed grass prairie, and reclaimed areas also show the capability to withstand and recover from years with below-average rainfall amounts. Cover and productivity on reclaimed areas were limited during the drought years of 1985 and 1988. In more favorable years, like 1989, 1990, and 1991, cover and production rebounded on the reclaimed areas.

Vegetation monitoring has also documented increased species diversity and shrub density in recent years. Through the evolution of seeding methods, seeding rates, seed mixes and evaluation of interim vegetation monitoring data, significant progress has been made in enhancing species diversity and establishing shrublands.

The success of revegetation has also been evaluated in conjunction with a grazing demonstration study conducted over the past three years on reclaimed areas. Data from this study has shown that excellent weight gains can be attained by cattle utilizing the reclaimed areas. Forage utilization levels in the pastures have been between 50 and 65 percent, and livestock weight gains have been approximately two pounds per day. Vegetation sampling from the two pastures utilized in the study suggests that grazing is having no adverse impact on the vegetation and that the reclaimed areas are stable enough to support a managed grazing program.

Vegetative impacts from mining the WBT tract would be temporary. It is anticipated that the WBT tract could be successfully revegetated using the same techniques currently being used at the BTM, based on the similarity to the WBT tract to the premine BTM tract.

5. Land Use

During mining, portions of the WBT tract and adjacent areas would be unavailable for livestock grazing. At a mining rate of 30 million tons per year, about 300 acres per year would

be disturbed. Considering time required for topsoil and overburden removal in advance of mining and spoil grading and topsoil replacement following coal removal, the area disturbed at any given time would probably total 500 acres or more. Under the proposed action, this disturbance would be divided between the existing lease and the WBT tract.

The three plugged and abandoned oil wells would be mined through and the plugs replaced. TBCC has had experience with this procedure in the current lease area. Mitigation of impacts to the two producing wells is discussed in Section IV.C. of this report.

6. Wildlife

During mining, pronghorn would be displaced to adjacent sagebrush-grassland habitat. Due to the quality and quantity of the adjacent habitat, minimal or no impact to pronghorn is anticipated as a result of leasing this tract. Pronghorn are already using reclaimed areas seasonally, and as the shrub component on reclaimed land increases, more winter use of this land by pronghorn is expected. Deer and elk habitat on the WBT tract area is limited, and there would be little impact on these species.

Although existing raptor nest sites would be destroyed by mining on the proposed lease area, it is unlikely that nesting raptors would be deleteriously impacted because of the availability of alternate nest sites. Only one of the four ferruginous hawk territories in the proposed lease area has been regularly active since 1983. Nests from that territory could be relocated prior to mining to suitable sites proximate to their present locations. This would help maintain the productivity of the existing pair. The eagles that may nest in the proposed lease area have demonstrated acceptance of past mitigation measures, and probably could be relocated away from the area in the future. There is a raptor mitigation plan for all nests on the Black Thunder permit area which must be updated each time new lands are added to the permit area, when the mine plan is significantly changed, or when the permit is renewed. Mitigation plans would be submitted to the USFWS for review and approval.

Sage grouse are not limited by lack of habitat in this area, and therefore would not be impacted by temporary loss of this habitat on the WBT tract. Because non-raptor migratory birds of high federal interest do not regularly use the area, mining would have a negligible impact on these species. No unique source of prey for bald eagles exists on the WBT tract; therefore the impact of mining on this species would be negligible. Because no prairie dog towns exist within one mile of the WBT tract and therefore no prey for black footed ferrets, mining would not impact black-footed ferrets.

7. Cultural Resources

Cultural resources located on the WBT tract will be irreversibly impacted by mining. For those sites eligible for the National Register of Historic Places, a treatment plan will be developed and implemented prior to disturbance to mitigate the impact. As discussed previously, treatment plans will be developed jointly with all appropriate regulatory agencies. Therefore,

before a site is mined away, all important information and site detail will have been collected for the permanent record.

8. Paleontological Resources

No unique or significant paleontological resources were found in the paleontological survey conducted by Dr. Dale Hoffman in 1975. In the event that significant paleontological resources are discovered in the course of mining, those resources will be handled as specified in the special stipulations concerning paleontological resources which is cited in section IIA of this EA.

9. Visual Resources

No unique visual resources are found on the WBT tract, and therefore impacts to visual resources would be minimal. The need to remove and stockpile overburden, extract coal and construct facilities requires a major modification of landforms in coal lease areas. These activities are already occurring extensively as a result of several nearby surface mining operations. The additional cumulative increment, when compared to the general visual classification adjacent to the mines, is negligible. Option A would result in an additional visual impact as a result of the proximity of the mine to Highway 450.

The duration of the visual impact varies from one to several years. However, stringent reclamation guidelines require that these lands be restored to their premine character to the extent practicable.

10. Noise

There have been no notable off-site noise impacts from the existing operations at the BTM. The proposed WBT lease is approximately the same distance from public access (Highway 450) as the existing operations. The nearest residence is about 2.5 miles from the proposed lease area and is owned by the Jacobs Ranch, a Kerr-McGee subsidiary which operates the agricultural portion of the Kerr-McGee coal mining business on the undeveloped and reclaimed mine land. The WBT tract is no closer to this residence than is the current pit, and is much farther from this residence than the initial pit at the BTM. Since no noise problems occurred when the pit was closer to the residence, it is reasonable to expect that mining the WBT tract will not cause noise problems. The next nearest residence is about five miles northwest of the proposed lease area. The WDEQ/LQD mine permit regulates blasting noise and vibration from a mine within one-half mile of the mine permit boundary. Thus, it is unlikely that noise impacts at the nearest public access or neighbor would be significant. Potential onsite noise impacts to workers are regulated by the Mine Safety and Health Administration (MSHA). Since no workers would be housed at the mine site, compliance with the work-related hearing conservation programs of MSHA is sufficient to insure impacts to workers on the proposed lease area would be minimized.

Section III.B.11 of this report states that ambient noise levels are in the 30 to 45 decibel range, while the noise level in the immediate vicinity of mining operations is in the range of 85 to 95 decibels. The psychological property of a sound called *loudness* is intimately connected with the *intensity* of a sound wave. Intensity, generally measured in units of watts per square meter, of a sound wave is the power transferred through unit area normal to the direction of propagation. For a pure tone of given frequency, loudness increases with increasing intensity, but in general the relation between the loudness of a sound and its intensity is not simple. Loudness cannot be measured in physical terms, since it depends on the ear and judgement of the individual observer.

Using intensity as an indicator, it is possible to estimate approximately the distance one would have to be from a sound source 100 decibels in the mine area to have the sound reduced to the ambient level of about 40 decibels. This estimate is based on the fact that energy is inversely related to the square of the distance and that the logarithm (base 10) of the ratio of two sound intensities is called the difference in intensity level, or bels. Ten times this logarithm is called the difference in intensity level in decibels (db), and this difference is ordinarily used to compare intensities of two sounds. A sound 10 times as intense as another has an intensity level 10 db higher. Thus a sound of 100 db has an intensity level one million times higher than a sound of 40 db (10^6). A 100-db sound would be reduced to a 40 db level at a distance of about 10,000 feet from the source, assuming no attenuation of the sound. In other words, the sound of a 100 db source would be reduced to near ambient levels within 10,000 feet (less than two miles) from the source. Since the nearest dwelling is over 2.5 miles from the mine, it is unlikely that most sounds from the mine can be detected at this location.

11. Air Quality

As discussed in Section III.B.12 of this report, air quality monitoring indicates that coal production in Wyoming's Powder River Basin increased nearly 2.5 times between 1980 and 1989 without adversely impacting air quality. This is a measure of the effectiveness of controls. These controls, which include bag houses, covered transfer points, sprinkling of water and addition of EPA-approved chemicals to haul roads, limiting disturbance areas, and contemporaneous reclamation, enable operators to plan and implement ways to increase coal production without adversely affecting air quality.

The amount of additional air quality resource that is available for future mining cannot be quantified without a rigorous technical evaluation. The amount of air increment utilized by a particular operation is highly dependent upon the type of operation, the types of equipment, and the mining sequence. Under the proposed action, the air quality impacts would not be significantly different from the present because the WBT tract would be used to extend the life of the operating BTM and would not have additional fugitive dust sources. The relative locations of emission sources, such as topsoil removal areas, haul roads, and active pit areas, would change but the numbers and types of sources would not.

Before the WBT tract can be mined, even as an extension of an operating mine, an air

quality permit application must be submitted to and approved by WDEQ/AQD. The analysis of emissions for the WDEQ/AQD permit modification would be similar to previous analyses since no changes in mining methods or rates are proposed. The haul distance from the WBT tract to the coal preparation plant would be less than from the southern portions of the current permit area to the plant. Thus one source of emissions, dust from the coal haul road, could be reduced from current levels when the WBT tract is mined. When mining is concluded on the southern end of the current permit area, the near-pit crusher and conveyor will be extended to the northwest, further reducing the average haulage in trucks. The average volume of overburden removed per ton of coal mined will be somewhat larger in the WBT tract than in the current mine area. Thus, even though coal production rates will not change, the sizes of the pits and the annual volumes of overburden removed will increase. Offsetting this change, a new dragline is currently being erected, which will reduce the amount of overburden hauled in trucks. Other than this, no changes in size and numbers of machinery are being proposed at this time.

Mining is currently done at up to six active coal faces. Mining plans now on file with WDEQ/LQD show that the number of active pits will be reduced, and reclamation will begin to proceed at a faster rate than new disturbance for the next several years. This should help reduce dust emissions compared with current emission rates.

Blasting, another source of emissions, will increase due to gradually increasing overburden thickness and to company plans to utilize more cast blasting. Cast blasting may increase short-term blasting emissions, but will decrease the amount of overburden moved with draglines, shovels and haul trucks. Cast blasting is a permitted procedure whereby backfill is cast into place using explosives which reduces the amount of material to be rehandled. The net effect to air quality will be determined ultimately through monitoring.

Option A of the proposed action would not directly affect air quality except to extend the life of the mine incrementally. However, under Option A blasting and mining operations would be closer to Highway 450, making the dust from operations more visible to the public. There is a potential for impacts to highway travelers in the form of blowing dust along the highway, as a result of the proximity of the pit to the road. However, the predominate wind direction at the site is out of the northwest, or away from the highway, and BTCC's previous experience with operations on both sides of the highway indicates that these types of impacts can be mitigated. Specific mitigation will be addressed in the mine's blasting plan.

Option B, leasing the WBT tract in two parcels, could impact air quality if the two parcels are leased to two different operators and if the operators mine concurrently. Having two pits in close proximity to each other could essentially double the emissions, requiring both operators to implement additional controls in order to maintain compliance with air quality standards. Both operators would be required to submit air quality permit applications and conduct computer air quality modeling.

12. Transportation Facilities

Mining of the WBT tract by TBCC would not increase the current level of impacts on transportation facilities, other than the potential for increased dust under Option A, as discussed above under air quality. By extending the mine life, the current levels of use of Highway 450 and the railroad spur would also be extended.

The nearby Jacobs Ranch Mine is scheduled to end operations in year 2012 assuming their maintenance tract lease (No. WYW117924) is approved (BLM, 1991). During the final years of operation at BTM the use of both the railroad and highway will be reduced from current levels if Black Thunder is the only mine still using these facilities. Thus extending the life of Black Thunder would not cause additional use of existing transportation facilities over and above what is now occurring.

13. Socioeconomics

If the WBT tract is leased to TBCC to extend the life of the BTM, a new mine and reclamation plan would be developed to show a logical mining sequence from the current northwest pit into the WBT tract. Coal production would occur from both the WBT tract and the existing lease simultaneously. Although the new mine plan has not been finally designed, pending the outcome of the lease sale, TBCC has made preliminary plans for mining this tract. These plans show coal production from the mine, including the current lease and the WBT tract, averaging about 30 mmtpy. Since the application is for approximately 400 million tons of recoverable coal (433 million tons with option A), mining of this additional coal would add approximately 13 years to the life of the mine (14 years for Option A). Production is weighted toward WBT in the early years due to its proximity to the facilities area compared with the southern reaches of the current lease area, although annual production from the WBT tract has not been estimated.

The current spot-market price of coal for the BTM is estimated at \$4.00 to \$5.00 per ton. Assuming a future price of \$5.00 per ton, the market value of the additional coal would be about \$2 billion (\$2.17 billion under Option A) in addition to expected market value of the coal from the current lease. Applying an economic multiplier of 1.796 to the revenues, the total economic impact to the local area from the additional coal would be approximately \$3.6 billion (\$3.9 billion for Option A), based on spot coal prices. Since long-term contract prices are generally higher than spot coal prices, the economic impacts would be larger if long-term contract are considered.

Employment at the BTM would be able to be maintained at current levels under the proposed action, continuing to average about 500 employees. This results in annual wages to mine employees of about \$23.5 million. These wages would continue for approximately 13 additional years under the proposed action and 14 additional years under Option A. Without the WBT tract, coal production and therefore employment would begin to decline after 1996.

The level of mine operations under the proposed action or Option A would not create any boomtown effects because annual output, as well as labor and wage levels, would not increase significantly from current levels. However, mining the WBT tract as a maintenance tract to extend the life of the BTM would enable current staffing levels to be maintained for a longer time period.

Ad valorem and severance taxes are paid by the mine to the State of Wyoming, but these are not directly returned to the local area. Likewise, revenues from sales and use taxes related to coal production are realized by the State. Some of these revenues are redistributed to the local communities, with the amounts of these redistributions being dictated by state laws and policies.

Statewide, severance taxes and capital facilities taxes imposed on coal production in 1989 amounted to \$97,582,590. This tax was assessed on a coal production with an average price of \$8.21 per ton, and equated to a tax rate of 8.5 percent (Wyoming Coal Information Committee, 1991). Wyoming's general fund receives the largest share of the severance taxes (24 percent), followed by state highways (23 percent), the permanent mineral trust fund (18 percent), water development (17 percent), the budget reserve (12 percent), the school foundation (5 percent), and community colleges (2 percent) (Wyoming Coal Information Committee, 1991, p. 10).

Option B would not change the amount of coal recovered, hence, the total economic impact from coal recovery, but leasing the tract in two parcels may change the production rate and therefore the rate at which the economic benefits accrue to the state and federal governments, and to the local communities.

Of the total gross revenues received by mines from sales of federal coal, 12.5 percent is returned to the federal government in royalties. Of this, the state receives 50 percent. Of this 50 percent, the cities and towns receive 7.5 percent.

14. Hazardous Waste

Waste is generated during mining operations at the BTM as at all mines. Some of the waste is classified as hazardous by the EPA under the Resource Conservation and Recovery Act (RCRA), however the majority is not classified as hazardous. Non-hazardous waste, which is similar to domestic or municipal solid waste, is currently disposed of in onsite landfill(s) permitted by the WDEQ. Materials classified as hazardous waste at BTM include some greases, solvents, paints, and other materials which either contain listed wastes or may be hazardous by characteristic. These wastes are drummed and shipped to an EPA-permitted incinerator for disposal. In 1991, TBCC took steps to significantly reduce the quantities of hazardous waste generating materials used at the BTM by reducing purchases of hazardous solvents and leaded paints and by substituting non-hazardous lubricants.

B. Impacts of Alternatives

1. Alternative No. 2: No Action

Under the no action alternative, the WBT tract would not be leased. Disturbance of land on the WBT tract would be limited to current disturbance associated with the Little Thunder Creek Diversion and to overstripping necessary to recover coal within the current lease boundary. This disturbance would total about 65 to 70 percent of the land that would be disturbed by mining the WBT tract. The entire area, other than what has already been disturbed or would be disturbed by overstripping, would remain available for livestock and wildlife habitat.

Although much of the surface would be disturbed as a result of the Little Thunder Creek Diversion, even if the tract is not leased, the basic topography and the geology underlying the diversion area would not be affected. Aquifers in the overburden would remain unaffected, and drawdowns in the coal aquifer would only be those associated with the current operation. Changes to the drainage system on the WBT tract would be limited to what has already occurred by construction of the Little Thunder Creek Diversion.

The air quality would be altered primarily by the fact that the mining rate would begin to decline after 1996 and would cease several years sooner under this alternative.

The economic benefits described in the previous section attributable to the WBT tract, including employees' wages, taxes and royalties, would be forgone under this alternative.

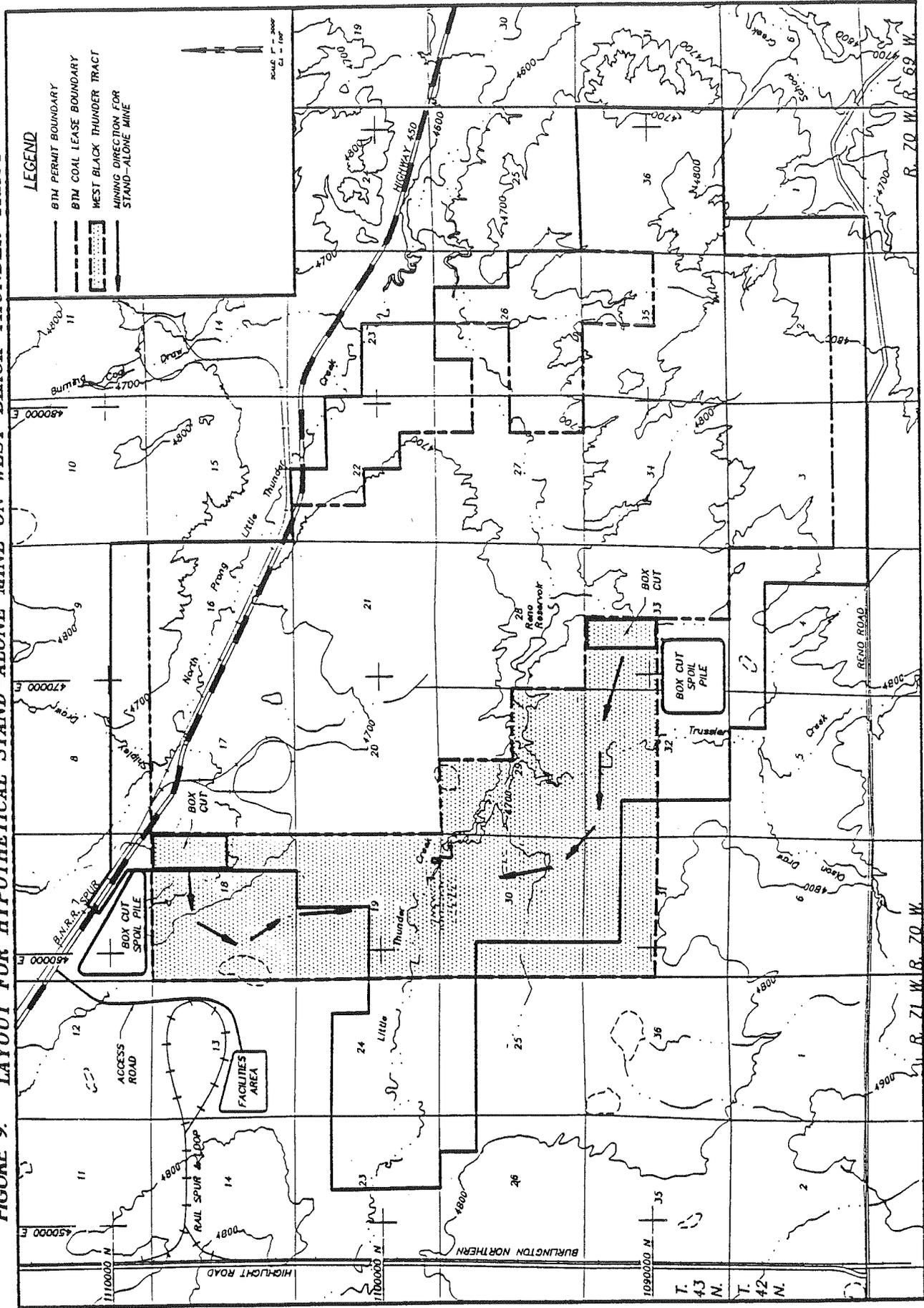
2. Alternative 3: New Stand-Alone Mine

The size of the WBT tract makes the stand-alone mine alternative logistically feasible. No analysis has been performed to determine the economic viability of such a project.

In order to predict environmental impacts of a new mine at the WBT tract, a hypothetical mine plan and layout are required. Figure 9 shows one possible stand-alone mine designed to recover coal from the WBT tract. This scenario was developed by the BLM to be used as an assumption for an analysis of potential impacts of this alternative. If the WBT tract were to be mined as a stand-alone tract rather than as a maintenance tract, the lessee would not necessarily develop the lease in this manner or at this rate.

It was assumed that this mine would recover about 400 million tons over its life. Reflecting recent trends, the mine would probably be a dragline operation with truck-shovel assisting for overburden and interburden removal. The hypothetical mine plan assumes there would be two pits to enable coal mixing and optimize stripping operations. The starting locations (box cuts) and directions of mining are illustrated on Figure 9. Both box cuts would require out-of-pit overburden stockpiles, and possible locations are shown on Figure 9. The south pit box cut spoil is located off the WBT tract and outside the existing BTM lease. The

FIGURE 9. LAYOUT FOR HYPOTHETICAL STAND-ALONE MINE ON WEST BLACK THUNDER TRACT



north pit box-cut spoil is located off the WBT tract as close as possible to the box-cut without placing it over coal within the tract. If the tract is amended to include the Option A area in Section 7, which is the preferred alternative of the BLM, this box-cut spoil would have to be placed elsewhere.

The hypothetical facilities area was located in Section 13, west of the WBT tract over coal that may be too deep to mine economically in the foreseeable future. A rail spur was linked to the main Gillette-Douglas spur line in Section 14. Regarding production from the stand-alone mine, the hypothetical schedule shown in Table 14 was assumed. Table 14 shows coal production averaging about 11.4 mmtpy over the 35 years of actual mining.

Table 14. Hypothetical Coal Production Schedule for Stand-Alone Mine on WBT Tract

YEAR	COAL PRODUCTION (mmtpy)
1-6	No production--used for baseline studies, permitting, and construction of facilities.
7	0.5
8	1.0
9	2.5
10	5.0
11	7.5
12	10.0
13-39	13.0
40	11.0
41	9.0
42-46	No production-reclamation only.

According to this scenario, if the lease sale were held in 1992 (year 1), the hypothetical mine would commence mining in 1998 (year 7), following baseline data collection, preparation of an environmental impact analyses, and satisfying the requirements for obtaining a mining permit. Peak production of 13 mmtpy would be reached in 2004 (year 13), and the last production would occur in 2032 (year 41). This is about 15 years after production is now scheduled to cease at the BTM. The assumption is made that it would be possible to obtain an air quality permit for this stand-alone mine for this production rate.

At an average production rate of 11.4 mmtpy, the hypothetical stand-alone mine would require disturbance of an average of about 110 acres per year, including overstripping along the lease boundaries. Additional disturbance would be required for the facilities area and loop (640 acres), rail spur (30 acres), access road (10 acres), box-cut spoil storage areas (400 acres), and diversion or storage facilities for Little Thunder Creek, North Prong, Trussler Creek and BK Draw outside the tract boundaries (200 acres).

It is assumed that employment at the stand-alone mine would be between about 230 and 300 people. Initially, this would represent up to a 300 person increase in employment in the area, not including employment during the construction of the mine. However, employment would begin to decline at the Black Thunder Mine after 1996, as projected by the current Black Thunder mine plan. Therefore, it is assumed that there would initially be an increase in area employment which would also decline after 1996.

To minimize air quality impacts and because of the distance from the south pit to the facility area, it is assumed that the new mine would have an overland conveyor from the south pit.

Environmental impacts of the stand-alone mine can best be examined by comparing features of this mine with the existing BTM extended into the WBT tract (Alternative No. 1, the proposed action). The total area disturbed by coal removal would not change as a function of mining as a stand-alone mine or a maintenance tract at the BTM. However, total disturbed area would be larger for the stand-alone mine. Additional disturbances would include a new loop track and coal preparation plant, a new railroad spur, a new access road, and two out-of-pit spoil stockpiles to accommodate the two box-cuts at the stand-alone mine. This additional disturbed area would total about 1,080 acres. Facilities required to store or divert the flows of the major streams around the pit areas would probably be the same whether this is a new mine or a maintenance lease.

Initially, more area would be disturbed with two ongoing operations, however the duration of the disturbance as a result of mining at the BTM would be decreased. The hydrologic impacts would not be significantly different for a new stand-alone mine versus a maintenance tract. Two separate operations would require more sediment-control facilities. With two ongoing operations, the rate of water level lowering could potentially increase, although there should not be a change in the area affected, whether the WBT is mined as part of the BTM or as a separate operation. The duration of mining at the WBT would be decreased if the WBT lease were mined as a separate operation, so the initial increase in rate of water level decline would not persist throughout mining of the WBT tract. If the new mine constructed one or more water-supply wells in the sub-coal Fort Union Formation, there is some likelihood that there could be interference (i.e., intersecting cones of depression) between these wells and the existing BTM facility wells. However, with two miles separating the two preparation plants it is unlikely that the cumulative effects would be significant, much less dewater the aquifers. Moreover, the potential impacts would only affect the two mine operations.

Because of the larger disturbed area and the longer life of the new mine, more livestock and wildlife habitat would be unavailable for historic uses under this alternative.

Visual impact would be increased for the stand-alone mine, primarily because of the requirement for new coal-handling facilities, with high-profile structures such as coal-storage silos and load-out facilities. These facilities would probably be visible from both the Highlight Road and Highway 450.

The additional emissions from the new preparation plant and larger disturbed area, as well as the simultaneous operation of two adjacent mines, would probably cause more deterioration of ambient air quality for this alternative as compared to the proposed action, even if the aggregate production remained at 30 mmtpy. The air quality permit for the new mine would require a level of controls such that air quality standards are not violated.

Transportation facilities would be impacted somewhat by Alternative 3. Any additional employees would be expected to live in Gillette and Wright and would use Highways 59 and 450 to travel to work. The railroad might haul additional tonnage while the two mines are in simultaneous operation.

The railroads have expressed intentions to increase rail capacity to keep pace with coal production. In January 1991, the Union Pacific Railroad (UP) announced a 5-year, \$250 million program to upgrade their major coal-hauling trackage in six states, including Wyoming. This is part of a \$620 million improvement plan. The UP, in a joint venture with the Chicago and Northwestern (CNW)-Western Railroad Properties, Inc., hauls coal out of the Powder River Coal Field to eastern Nebraska, from which point UP operates a major coal transportation route to midwestern U.S. markets. CNW also announced that they would do whatever was necessary to keep pace with increasing coal production (Wyoming Geological Survey, May 1991, p. 30). Burlington Northern (BN) announced that they would spend upwards of \$190 million per year over the next several years on their major coal unit-train routes. In their announcement BN claimed they would be able to handle an additional 50-60 million tons of coal per year by 2001.

According to the unemployment figures for Campbell County (see Section III.B.14 of this report), 230 to 300 additional employees could be supplied from local labor. An added payroll of an estimated \$10 million per year would accrue to the local economy, offset by whatever declines in employment occur at BTM.

The addition of up to 300 new jobs could potentially impact housing and public facilities in the nearest community, which is Wright. As discussed in section III.B.14, unemployment figures for this area indicate most of the needed employees could be supplied from labor already living in the area. Therefore, the impact to Wright is not expected to be significant. Also, as indicated in section III.B.14. of this document, housing data indicate that there is sufficient housing in the area (including Gillette, Wright, and Newcastle), to accommodate over 900 additional workers.

Cumulative severance tax and royalty revenues would not vary between Alternatives 1 and 3 except as sale prices might vary, but the yearly distribution of these revenues would vary as a function of combined production between the two mines. In the short term, there would be an increase in tax and royalty revenue as a result of a new mine. In the long term, this would be offset by declining production and earlier closure of the BTM. Additional property taxes would be realized due to the additional plant and equipment associated with Alternative 3.

Option A would increase the impacts of a new mine start incrementally as described in

the proposed action. Option B could preclude a new mine start if neither tract was large enough to start a new mine, and if the company interested in establishing a new mine operation failed to acquire both tracts.

It may not be economically feasible for a new mine to start production on the WBT tract and effectively compete with existing Powder River Basin mines for new coal sales. Each ton of coal sold from a new mine would need to recover all of the costs associated with producing the coal and provide a sufficient return on capital investment. As a result, the minimum selling price of coal required for a new mining operation would be higher than for existing mining operations.

3. Alternative 4: Postponement of the Lease Sale

Under this alternative, the WBT lease sale would be postponed under the assumption that potentially rising coal prices in the future would increase the value of the coal and the federal government would receive a larger bonus bid up front from the lease sale.

Since the 12.5 percent royalty payments are the major source of revenue to the Federal and state governments, and they are collected when the coal is sold, the mechanism is already in place for government revenues to increase if coal prices rise. Postponement of a lease sale does not guarantee that a price rise may be fully taken advantage of, since the time lag between the escalation of prices and bringing the coal to market may be several years. This lag is due to the time necessary for leasing, baseline data collection, permitting, and initiating a logical mining plan. Also, postponement could result in lower royalty revenues to the government if the operator must sell the coal on the cheaper spot market, because he cannot anticipate having the reserves to negotiate higher priced, long-term contracts.

The environmental impacts for this alternative could be the same as for any of the previous alternatives. If the lease sale is not postponed too long for TBCC to logically mine the tract, it could be mined as a maintenance tract. In this case the environmental impacts would be the same as for Alternative No. 1. If the lease sale is delayed beyond the time the WBT could be mined as a logical extension of the BTM, the value of the tract as a maintenance tract would decline. Once the boundary between the existing lease and the WBT tract has been mined and reclaimed, opening new box-cuts and re-affecting previously reclaimed land would result in additional costs to the BTM, and additional impacts to the area.

If WBT loses its value as a maintenance tract due to time delays, and if coal market conditions make it uneconomical as a stand-alone mine, the environmental and economic impacts of this alternative would be the same as for the No Action alternative.

If the lease sale were delayed so long that the tract could only be mined as a stand-alone mine, environmental and economic impacts would be similar to those for Alternative No. 3, except that there would be fewer cumulative impacts if the period of concurrent operations with other mines in the area is reduced.

C. Mitigation Measures

Impacts to topography caused by mining can be mitigated by proper design of the postmining surface. The design of the postmining topography would be reviewed by WDEQ/LQD during the permit application process. Design and approval of the postmining topography would be facilitated by following the USFS design guidelines for the Thunder Basin National Grassland (USFS, 1991). Specific recommendations pertinent to the WBT tract include providing topographic diversity in landforms and hillslopes, stable channels that have natural-appearing meanders and pools, and rockpiles and shrub mosaics designed and located so as to give a natural appearance and provide wildlife habitat and cover. The postmining topography design would be required to approximate original contours, which, as generally agreed, means that the shape of the land after mining should be about the same as before, though not necessarily at the same elevation (Martin, et al., 1988, p. 118).

Impacts to ground-water quality can be mitigated by special handling of chemically undesirable overburden materials to assure that these materials are not placed so as to adversely affect water quality. All mine permit applications submitted to WDEQ/LQD must include baseline data on overburden geochemistry and special handling plans for unsuitable materials. Provision of ponds and reservoirs on the reclaimed surface, similar to what TBCC is doing on the BTM, helps conserve surface water resources and provides a recharge source for the spoils aquifer.

Impacts to ground-water supplies will be mitigated. SMCRA and state regulations require that water uses which are interrupted by mining be mitigated by replacement with water from an alternate source of equivalent quality and quantity. Typically wells which go out of production due to mine-related drawdowns are replaced with deeper wells completed in the sub-coal formation.

Special care must be taken to provide stable channels in the reclaimed surface. The design of stable drainage basins is critical to the success of the overall reclamation plan, and this issue receives considerable attention during the permit process.

Impacts to soils can be mitigated by proper identification and handling of topsoils, protection of stockpiled and replaced soils from erosion hazards, and revegetating replaced soils as rapidly as possible. Nutrients lost during handling or stockpiling can be replaced. The erosion control, reclamation and revegetation program outlined by TBCC and implemented on the adjacent BTM has provided an effective program that ensures successful erosion control and restoration of all land disturbance. Salvage of soils otherwise unsuitable for reclamation due to heavy texture or high salinity may be acceptable for use in special reclamation practices such as restoration of wetlands or playas.

Continued emphasis on increasing vegetal species diversity on reclaimed lands, and particularly on establishing shrublands, would help restore wildlife habitat on reclaimed lands.

Playas, which rely on topography, soil types and vegetation, provide special habitats that would be restored in the postmining topography. Continued sampling and monitoring and grazing demonstration studies such as that practiced at the BTM would provide valuable data for continuing improvements in revegetation practices.

Wildlife impacts can be mitigated by continuing to consider wildlife habitat in the reclamation planning. Topographic features such as rockpiles and playas, riparian features such as channel potholes and impoundments, and revegetation features designed for wildlife, such as shrublands and trees where conditions permit, would all help to restore and enhance wildlife habitat on reclaimed land. Continued monitoring will provide important feedback concerning the effectiveness of these measures and, hence, important data for future designs. Mitigation efforts should continue to include relocation of affected raptor nests and consideration of raptor nest sites in reclamation planning.

The coal lessee must prepare a mine plan study to determine if the operating oil wells would have any impact on the mining operation. Alternatives to manage any conflicts with these wells include an economic evaluation to determine if they could be purchased or temporarily plugged and restored when mining has been completed. Under the FLPMA, multiple use and concomitant development of natural resources are governed by the Department of the Interior (USDI). USDI guidelines have been developed to address this type of situation. Moreover, the leased lands are managed according to the RMP land use plans. The coal lessee will coordinate the development of an agreement with the oil and gas lessees to facilitate maximum utilization of the mineral resources.

Impacts to cultural resources are addressed through the Section 106 process of the National Historic Preservation Act of 1966, as amended, and through other appropriate legislation and regulations. This specifies that the federal land managing agency, in consultation with the Wyoming SHPO, will make final eligibility and effect determinations for all sites located within the proposed lease area. If any sites are found to be eligible for the NRHP and cannot be avoided, then an appropriate treatment plan will be developed and implemented prior to mining, in accordance with 36 CFR 800 and other relevant regulations.

Three previously identified cultural resources that are eligible for the NRHP and will require treatment plans are located within the area of effect. Two are located within the proposed coal lease boundary and one on the adjacent buffer zone. New sites that have not yet been reviewed for their eligibility for the NRHP will require final evaluation for nomination to the NRHP. Those new sites that are not eligible for the NRHP will not be considered further, as all pertinent data has been gathered. New sites which are eligible for the NRHP and cannot be avoided will be handled by developing and implementing a treatment plan prior to mining as required by the National Historic Preservation Act.

All hazardous materials generated on the proposed lease area would be handled in accordance with current regulations.

D. Residual Impacts

Despite proper reclamation planning and implementation of mitigating measures, there are impacts of mining that remain after reclamation is completed. The coal aquifer and any overburden aquifers are replaced with spoil material. While indications are that this material would function as an aquifer and, in fact, is resaturating more quickly than generally predicted (Martin et al., 1988, p. 156), it would be some time before the spoils are fully saturated and a steady-state flow pattern is reestablished. In the meantime there would be no shallow groundwater source in the reclaimed areas. Just as during mining, alternative sources of water would be required for these areas until the spoils aquifer can sustain water uses.

Once the spoils aquifer resaturates and a steady-state flow pattern is established from the spoils aquifer to the undisturbed coal and overburden aquifers, water quality in those aquifers may be temporarily degraded.

Although coal-aquifer drawdowns toward the west (down-gradient) of the mines become less important as the depth to coal increases (hence fewer wells are completed in the coal), these drawdowns could persist for several years.

E. Cumulative Impacts

Six LBAs are currently pending before BLM in the Powder River Basin of Wyoming, and there are eighteen operating mines in this area. NEPA requires that cumulative as well as site specific impacts of proposed federal actions be considered as part of the decision making process. The need to consider the cumulative impacts of the proposed LBAs is an issue which was raised during the scoping conducted for the Jacobs Ranch and the West Black Thunder LBAs and in the comments received on the Jacobs Ranch EA.

According to the Council of Environmental Quality, "cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative actions can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). This section should not, and does not, address impacts specific to the Black Thunder LBA, as those are addressed elsewhere in this EA.

Six LBAs have been received to date: Jacobs Ranch, West Black Thunder, North Antelope, Rochelle, West Rocky Butte, and Eagle Butte. Five of the LBAs were applied for as maintenance tracts, intended to extend the life of already existing mines: Jacobs Ranch, West Black Thunder, North Antelope, Rochelle, and Eagle Butte. West Rocky Butte is adjacent to an existing lease on which there are no mining operations. On September 6, 1991, the Powder River Regional Coal Team voted to proceed with this application, although it is not a mine maintenance tract.

Four of the LBAs are located in an area southeast of Wright, Wyoming, near the southern end of the eastern Powder River Basin coal producing trend: Jacobs Ranch, West Black Thunder, North Antelope, and Rochelle (Figure 10). The Rocky Butte lease is located approximately ten miles south of Gillette, in the central part of the Wyoming Powder River Basin coal producing area, and the Eagle Butte LBA is located approximately five miles north of Gillette, at the northern end of the coal producing trend (Figure 10).

There are currently 7.797 billion tons of federal coal underlying 102,426 acres under lease in the Wyoming portion of the Powder River Basin. The six LBAs received to date propose to add approximately 1.035 billion tons of federal coal underlying 8,428 acres. This represents an increase of 13 percent of leased federal coal and an increase in acreage of 8.2 percent. At the 1990 rate of coal production for the Wyoming portion of the Powder River Basin of 162.6 million tons mined, the coal underlying the proposed leases represents approximately 6.4 years of leased reserves for the basin as a whole.

The following discussion of cumulative impacts includes a comparison of the actual coal activity occurring in the Wyoming portion of the Powder River Basin in 1990 with the activity predicted for 1990 in four previously prepared environmental impact statements on coal mining in the basin. Following that is a discussion of the cumulative impacts of the proposed LBAs added to current mining.

1. Actual and Predicted Coal Activity in the Eastern Powder River Region

This cumulative impact analysis updates the cumulative analysis which is contained in each of four regional EISs prepared during the 1970's and early 1980's. The four analyses are:

- Final Environmental Impact Statement, Eastern Powder River Coal Basin of Wyoming, BLM, October 1974
- Final Environmental Statement, Eastern Powder River Coal, BLM, March 1979
- Final Environmental Impact Statement, Powder River Coal Region, BLM, December 1981
- Draft Environmental Impact Statement, Round II Coal Lease Sale, Powder River Region, BLM, January 1984

This update provides an assessment and analysis of cumulative environmental impacts based on current coal production and presently anticipated levels of regional development activity. The analysis reviews cumulative impacts identified in the above referenced EISs as compared to the actual development activity which has occurred. This cumulative analysis also incorporates data, monitoring results and research done since the EISs were done, or in response

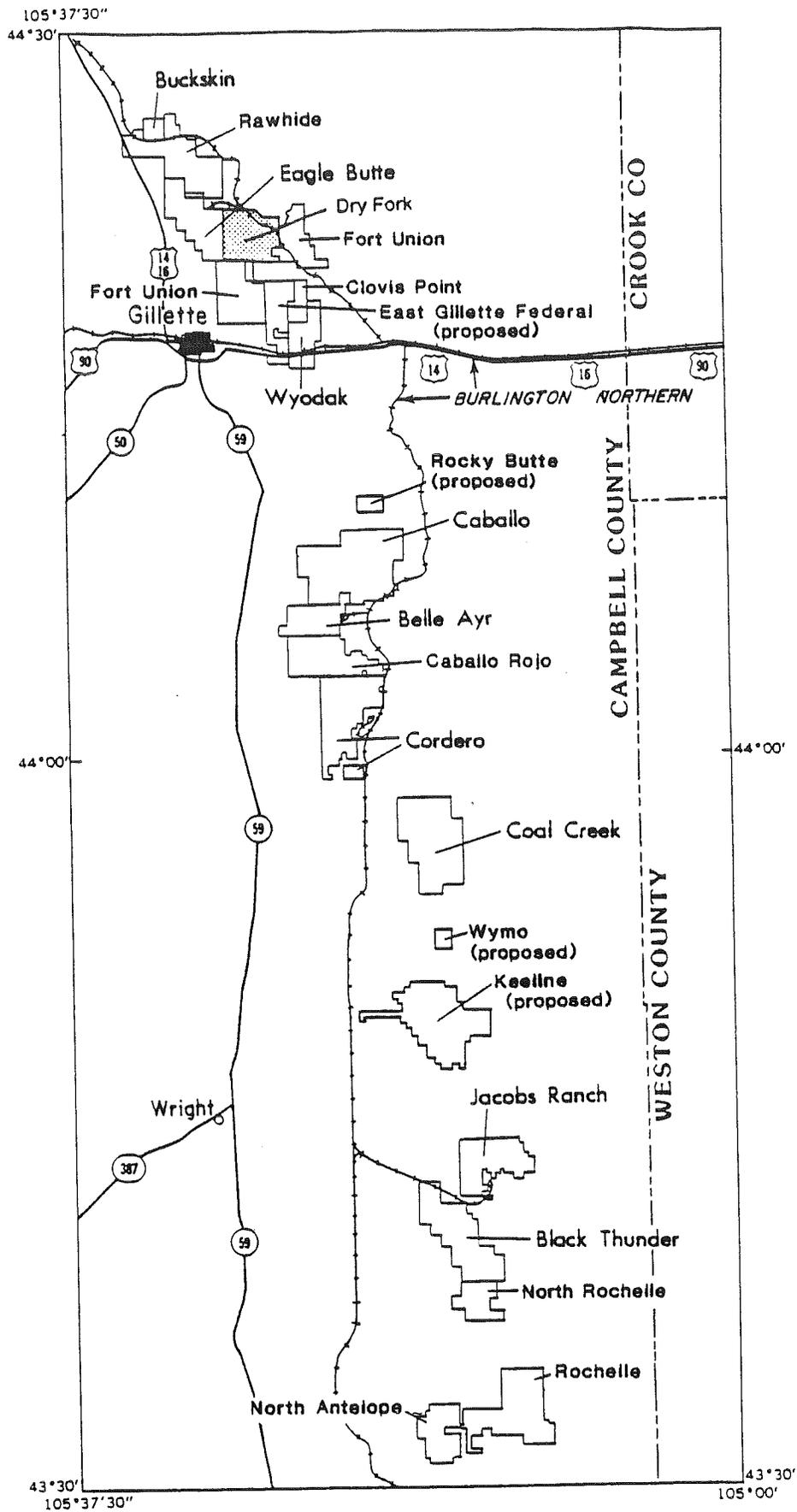


Figure 10-- Location of existing and proposed coal mines in Campbell County, Wyoming.

to impacts identified in these EISs, which will provide further assessment of cumulative impacts resulting if the lease by applications currently pending before BLM are approved.

The coal region in which the current lease by applications are located can be defined as the Eastern Powder River Coal Region, and is generally considered to include Campbell and Converse Counties in Wyoming. In the 1970's and early 1980's there was a great deal of interest and activity in mining existing leases and acquiring new federal coal leases. As a result, the four referenced regional EISs were prepared. Each identified and discussed the regional, cumulative impacts resulting from coal development, coal related development, and other regional activities, based on reasonably foreseeable development scenarios at that time. All of the mines currently operating, including those requesting LBAs, in the Eastern Powder River region were specifically addressed in one or more of the referenced EISs, as shown in Table 15.

Each regional EIS predicted coal mining activity into the future, looking at number of mines, production levels, and acreage disturbance. Coal related developments, such as power plants, coal gasification, and other coal conversion industries were predicted. Other regional activities such as oil and gas, uranium, and any other known major development activities were also predicted. Then an analysis was developed to identify and evaluate impacts of all of these activities taken together.

Table 16 shows what activity has actually taken place in the region, and also shows the cumulative total of the activity that has actually taken place added to the activity predicted based on the LBAs which are currently pending before BLM. The table also illustrates the predictions of coal, coal related and other regional development activity upon which the cumulative impact analysis for each of these regional EISs is based.

Table 16 shows that the actual level of development which occurred by 1990 is within the range of predictions made in the referenced EISs. In retrospect, the 1979 EIS was the closest prediction. This is explained by the fact that the 1981 and 1984 EIS assumed higher levels of new leasing and more development of new leases and pending preference right lease applications than has actually occurred. Market conditions have not favored the development of new mines.

Many of the impacts of the development activities are related to the amounts of surface disturbance, and new employment from the activity. Table 17 shows the 1990 predictions for each regional EIS as to acres disturbed, employment, and population. This table also illustrates surface disturbance, employment and population that actually had occurred or existed in 1990.

Cumulative surface disturbance to date is about 32,000 acres. This is within the range of predictions of the referenced EISs. Cumulative disturbance to date added to all the pending LBAs represents less than one tenth of one percent of Campbell and Converse counties. The acreage disturbed has been specifically analyzed in the referenced EISs and no unique soils or vegetation types were identified as being impacted. The disturbed acreage is being reclaimed, with about one third of the already disturbed areas already contoured, topsoiled and reseeded.

TABLE 15: MINE SITES ADDRESSED IN PREVIOUS REGIONAL EIS ANALYSES

MINE	OPERATOR	STATUS	1974	1979	1981	1984
Antelope	Antelope Coal Co.		EIS XX	EIS	EIS XX	EIS XX
Belle Ayr	Amax Coal Co.		XX	XX	XX	XX
Black Thunder	Thunder Basin Coal Co.	*	XX	XX	XX	XX
Buckskin	Triton Coal Co.			XX	XX	XX
Caballo	Carter Mining Co.			XX	XX	XX
Caballo Rojo	Mobil			XX	XX	XX
Clovis Point/ East Gillette	Kerr-McGee	**		XX	XX	XX
Coal Creek	Thunder Basin Coal Co.			XX	XX	XX
Cordero	Cordero Mining		XX	XX	XX	XX
Dave Johnston	Pacificorp		XX	XX	XX	XX
Dry Fork	Dry Fork Coal				XX	XX
Eagle Butte	Amax Coal Co.	*	XX	XX	XX	XX
Fort Union	Fort Union Ltd.				XX	XX
Jacobs Ranch	Kerr-McGee	*	XX	XX	XX	XX
Keeline	Neil Butte Co.	++			XX	XX
North Antelope	Powder River Coal Co.	*	XX	XX	XX	XX
North Rochelle	Shell				XX	XX
Rawhide	Carter Mining Co.		XX	XX	XX	XX
Rochelle	Powder River Coal Co.	*	XX	XX	XX	XX
Wyodak	Wyodak Resources Dev.		XX	XX	XX	XX
Rocky Butte	Northwest Resources	*++			XX	XX
TOTALS: 21 (19 Mines + 2 Undeveloped Leases)			11	15	20	20

* = LBA application on file

** = Currently Inactive Mine

++ = Undeveloped Existing Lease

TABLE 16: CUMULATIVE REGIONAL ACTIVITY, EASTERN POWDER RIVER COAL REGION
(CAMPBELL AND CONVERSE COUNTIES, WYOMING)

	1990 ACTUAL ACTIVITY	1990 ACTUAL ACTIVITY + LBA'S ***	1974 PREDICTIONS OF 1990 ACTIVITY	1979 PREDICTIONS OF 1990 ACTIVITY	1981 PREDICTIONS OF 1990 ACTIVITY	1984 PREDICTIONS OF 1990 ACTIVITY
NUMBER OF PRODUCING MINES	18	19	14	15	40*	37**,**
NUMBER OF POWER PLANTS	3	3	6	2	3	3
NUMBER OF GASIFICATION PLANTS	0	0	2	1	0	0
LEASED FEDERAL COAL (MILLIONS OF TONS)	7,796.5	8,831.5	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
ACRES OF LEASED FEDERAL COAL	102,426	110,854	93,075	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
COAL PRODUCTION (MILLIONS OF TONS)	162.6	178.6	150	174.3	332.9*	292.1*,**

* = Calculated from Wyoming and Montana totals in EIS. This EIS covered the entire Powder River Basin.

** = Baseline or "No Action" alternative used from this EIS. The 1984 EIS was not finalized and, therefore, the actions proposed were never taken.

*** = This column represents the actual 1990 activity added to the activity which would have been expected if the LBAs had been approved in 1990.

TABLE 17: CUMULATIVE SURFACE DISTURBANCE, EMPLOYMENT AND POPULATION –
 ACTUAL AND PREDICTIONS WITHOUT THE LEASE – BY APPLICATIONS,
 EASTERN POWDER RIVER COAL REGION (CAMPBELL AND CONVERSE COUNTIES)

	ACTUAL 1990 LEVELS	1974 PREDICTIONS OF 1990 LEVELS	1979 PREDICTIONS OF 1990 LEVELS	1981 PREDICTIONS OF 1990 LEVELS	1984 PREDICTIONS OF 1990 LEVELS
ACRES DISTURBED	31,744	13,887	22,794	43,550*	40,900*,**
ACRES RECLAIMED	9,199	4,132	12,666	24,200*	22,800*,**
COAL EMPLOYMENT	2,862	5,200	3,899	11,900	11,500**
TOTAL POPULATION	40,498	65,600	59,400	69,000	62,300**

*Wyoming portion calculated from Montana plus Wyoming total in EIS. This EIS covered the entire Powder River Basin.

**Baseline or "No Action" alternative was used from this EIS. The 1984 EIS was not finalized and, therefore, although analyses were done, the actions proposed were never taken.

Sources of 1990 data: 1990 Annual Mine Reports for Eastern Powder River Basin Mines, BLM Casper District
 Records, 1990 Census Results for Wyoming Counties/Municipalities, "Annual Report
 of Mines of Wyoming" through 12-31-90.

The success of revegetation (reclamation) depends on the ability of the plant communities to perpetuate themselves under the indigenous environmental conditions of an area, such as moisture distribution during the growing season, wind, temperature extremes, and drought. It also depends on the ability of the reclaimed land to meet postmining land use objectives.

Successful establishment of vegetative cover, according to the requirements of OSM as administered by WDEQ, has been demonstrated at the Dave Johnston, Black Thunder, Belle Ayr, Eagle Butte, Big Horn, Jacobs Ranch, Decker, and Rosebud coal mines, to name a few. As a rule, successful reclamation of land disturbed by coal mining depends on the total investment in reclamation rather than on physical factors.

Cumulative transportation impacts are related to coal production levels and are within the level of impacts identified in the referenced EISs.

Cultural sites are a non-renewable resource subject to destruction through disturbance. Specific impacts related to the decision to affect or avoid a site are addressed on a site-by-site basis. Unavoidable impacts to significant cultural properties are mitigated through approved recordation, research or data recovery plans. Although sites have been and will be affected and lost during the mining process, the information in them has been and will be preserved.

Cumulative visual impacts are related to surface disturbance and activity. In the short term mining activity dominates the landscape where mining is occurring. After mining is done the landscape character changes where rough, steep-sided hills, gullies or scoria knobs are replaced by more gently rounded approximate original contours.

The cumulative impacts on wildlife are caused primarily by new impediments to daily and seasonal movements such as road right-of-way fences and railroad spurs. There are also impacts from road kills, poaching loss, and habitat loss. With all the pending LBAs added to acreage already permitted to mine, about 1% of the wildlife habitat in Campbell and Converse Counties would be disturbed.

Because disturbance would not occur to a large part of the leased area at any one time and reclamation is continually taking place, habitat loss caused by the projects included in the cumulative analysis would be less than one percent at any one time.

One of the LBAs, West Rocky Butte, will, if approved, result in a new mine. With a new mine added to the current situation, total activity is within the reasonably foreseeable cumulative activity scenarios analyzed in the referenced EISs. As this potential new mine would result in an additional impact to the water resources, a new source of suspended particulate matter in the air and also new employment, an additional discussion of cumulative water, air quality, and socioeconomic impacts is presented. The additional impacts of a new mine start to other resources, such as wildlife, soils, and transportation are included in the discussion of these topics in the paragraphs above.

2. Water Resources

Surface coal mining does impact local hydrology, including both the surface and ground-water systems. These impacts have been monitored over the years of mining activity. The potential and actual extent of these impacts have also been the subject of several regional studies. This new data is identified and assessed in this cumulative analysis.

a. Ground Water

The cumulative impact of surface coal mining on groundwater is an issue which was raised during scoping conducted for the currently proposed coal leasing.

Concern over the effects of large-scale surface coal mining on groundwater around the mines has resulted in the establishment of a monitoring program which is administered by the State of Wyoming. Each mine is required to monitor groundwater levels in the coal itself as well as in shallower aquifers in the area surrounding their operations. There are also requirements for drilling monitoring wells in the backfill areas of the mines in order to record the recharge in these areas. The Gillette Area Groundwater Monitoring Organization (GAGMO) is a voluntary group which was formed in 1980. The purpose of GAGMO is to assemble and report the hydrogeologic monitoring data being collected by the coal mining companies operating in the eastern Powder River Basin of Wyoming, from the Buckskin mine north of Gillette to the Antelope Mine in northern Converse County. GAGMO is composed of the companies with operating or proposed mines in that area, the WDEQ, the Wyoming State Engineer's Office, the BLM, the USGS, and the OSM, which joined in 1991. Each year, GAGMO contracts with an independent firm to publish the results of the monitoring for that year. This year, GAGMO published two reports, an annual report for 1990, and a ten year report. The ten year report, which was prepared by Hydro-Engineering of Casper, summarizes the data accumulated during the last ten years of monitoring in the Powder River Basin. According to the GAGMO 10 year report (Hydro-Engineering, 1991), 646 monitoring wells were operated at 21 coal mines sites 1990. (The 21 sites included active and inactive mines, and unmined leases. The Dave Johnston Mine, located near Glenrock and the Rocky Butte unmined lease are not members of GAGMO.)

The major groundwater issues are:

1. The effect of the removal of the coal aquifer and any overburden aquifers within the mine area, and replacement of these aquifers with spoil material.
2. The extent of the temporary lowering of static water levels in the aquifers around the mine due to dewatering associated with removal of these aquifers within the mine boundaries.
3. The effect of the use of water from the sub-coal Fort Union Formation by the mines. Most mines in the Powder River Basin, have water-supply wells

completed in the sub-coal Fort Union Formation.

4. Changes in water quality as a result of mining.

The impacts of large scale surface coal mining on a cumulative basis for each of these issues are discussed in the following paragraphs.

1. The effects of replacing the coal aquifer and overburden with a spoil aquifer is the first major groundwater concern. The following discussion of recharge, movement, and discharge of water in the spoil aquifer is excerpted from the Powder River Basin Cumulative Hydrologic Impact Assessment (CHIA), a regional study of surface coal mining impacts in the Powder River Basin prepared by the USGS (Martin, et al., 1988):

The potential for recharge to the backfilled spoil would be greater than in areas not disturbed by mining. The natural bedding will be destroyed, creating a more isotropic condition in the spoil, resulting in generally greater vertical permeability than exists in undisturbed areas. The infiltration capacity of the backfilled and reclaimed spoil will be greater than that of the undisturbed Wasatch aquifer and Wyodak coal aquifer. However, the infiltration rate for reclaimed soils is less than that for natural soils due to the lack of root structure and other paths for vertical movement of water. After several years, infiltration rates for reclaimed soils will increase to approximately the same rates as for undisturbed soils. As infiltration rates increase to approximate premining conditions, ground-water recharge rates also will increase to approximate premining conditions.

Although the recharge potential of the reclaimed mine areas will increase, the actual recharge rate after reclamation probably will approximate or be somewhat greater than premining recharge. Actual recharge will depend on how well the surface contours are restored. A flatter average slope of the reclaimed land would increase the potential recharge by decreasing the rate of runoff from reclaimed areas. Recharge will increase locally where water is allowed to pond in surface impoundments. Also, some increase in recharge along re-constructed channels probably will occur during the infrequent periods of surface runoff.

Postmining recharge rates and mechanisms will not change in areas where lateral movement of ground water from adjacent clinker is a major source of recharge. This is because, in general, the clinker will not be disturbed by mining operations. After mining and reclamation have been completed, water will move laterally from clinker to the spoil aquifer.

Recharge to the spoil aquifer will be from infiltration of precipitation, lateral flow from the undisturbed clinker and the Wasatch aquifer and Wyodak coal aquifer, and leakage from surface-water impoundments and stream channels. Estimates of the time required for the ground-water system to re-establish equilibrium varies from a few tens of years to hundreds of years. The anticipated potentiometric surface of the spoil aquifer will resemble a composite of the premining potentiometric surfaces in the Wasatch aquifer and Wyodak coal aquifer. After equilibrium is re-established, ground-water flow patterns will approximate premining conditions. Discharge from the spoil aquifer will flow into the undisturbed Wasatch aquifer and Wyodak coal aquifer to the west (regional flow) or to reclaimed stream channels (local flow).

According to the 1991 GAGMO ten year report, 56 backfill monitor wells had been drilled as of 1990. The report listed the current water levels in these wells, and compared them

to the 1980 water-level elevations, which were estimated from the 1980 coal water-level contours. Of these 56 backfill wells, six (10.7 percent) were dry (the water level in that location was below the total depth of the well), 29 (51.8 percent) reported water at levels less than the water levels estimated for 1980, and 21 (37.5 percent) reported water at levels equal to or greater than those estimated for 1980. The presence of water in 89 percent (50 of the 56) backfill wells drilled as of 1990 indicates that recharge is occurring in the backfill.

The impacts of mining the proposed LBA's and the proposed new start mine would be to increase the size of the backfill area. However, since reclamation is done concurrently with mining, and the monitoring data indicate that recharge of the backfill is occurring, it is not anticipated that additional significant impacts will occur as a result of the leasing proposed in the LBAs received to date.

Clinker, the baked and fused rock formed by prehistoric burning of the Wyodak-Anderson coal seam, is believed to be the major recharge source for the spoil aquifer, just as it is for the coal. Although some clinker is mined for road surfacing material, saturated clinker is not generally mined since abundant clinker exists above the water table and does not present the mining problems that would result from mining saturated clinker. Therefore, the major recharge source for the spoil aquifer is not being disturbed by mining.

2. The second major groundwater issue is the extent of water level drawdown in the coal and shallower aquifers in the area surrounding the mines. Most of the monitoring wells included in the GAGMO 10-year report (578 wells out of 646 total) are completed in the coal beds, in the overlying sediments, or in sand channels or interburden between the coal beds. These holes range from 9 feet to 420 feet in depth. The changes in water levels in the coal seams after ten years of surface coal mining are shown in Figure 11, which was taken from the 1991 GAGMO report. This map shows the actual area where drawdown in the coal seam has been greater than five feet in ten years in comparison with the predicted worst-case five-foot drawdowns derived from groundwater modeling done by the mines. WDEQ/LQD policy is to have the mining companies determine the extent of the five-foot drawdown contour. In general, drawdowns do not extend east of the mines because the mines are located on or near the coal outcrop line. The actual ten-year five-foot drawdown contours have not exceeded the predicted worst-case drawdowns in any of the mines, and, in most cases, the drawdown contours are well within the mines' predicted worst case drawdowns.

Drawdowns extend farther in the coal than in the shallower aquifers because the coal is a confined aquifer and because it is areally extensive, whereas the shallower aquifers (Wasatch, alluvium, and clinker) are generally discontinuous and of limited extent. Therefore, the area in which the shallower aquifers have experienced a five foot drawdown would be smaller in each case.

The actual five-foot drawdown levels are also well within the cumulative drawdown predicted by the USGS in the Powder River Basin CHIA (Martin, et al., 1988). This study predicts the approximate area of five-foot or more water decline in the Wyodak coal aquifer

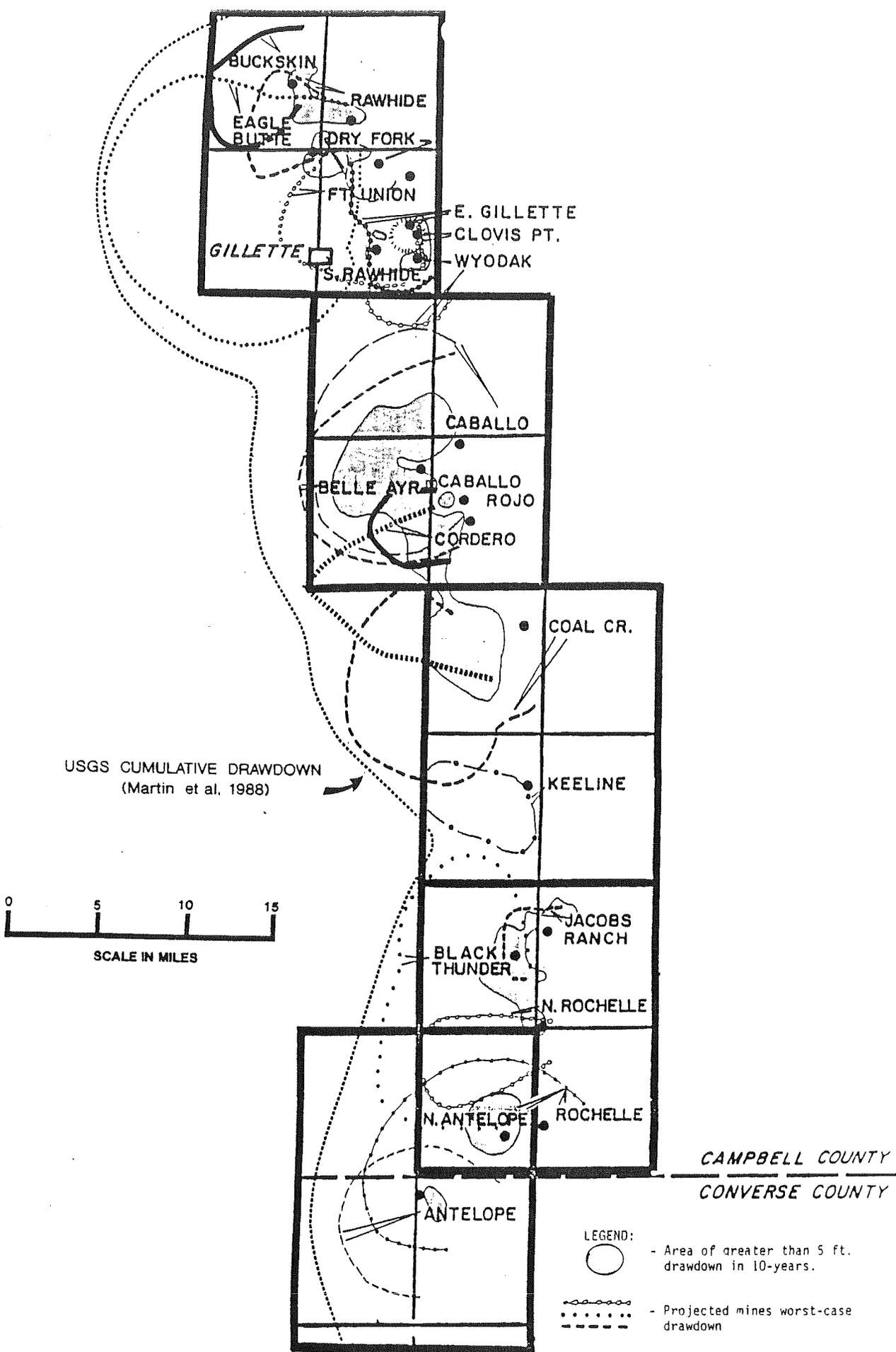


FIGURE 11. COMPARISON BETWEEN THE 1990 CUMULATIVE DRAWDOWNS AND THE MINES WORST-CASE AND THE USGS PREDICTED DRAWDOWNS. (Modified from Hydro-Engineering, 1991)

which will result from "all anticipated coal mining". "All anticipated coal mining" as referred to in the CHIA includes 16 surface coal mines operating at the time the report was prepared, and six additional mines proposed at that time. The proposed mines include two mines which are now producing, one mine which did produce for a short time, but is currently inactive, and the proposed Rocky Butte mine. The study assumes that water-supply wells completed in the coal may be affected as far away as eight miles from mine pits, although at this distance the effects were assumed to be minimal. Wells in the Wasatch are considered to be impacted by drawdowns only if they were within 2,000 feet of a mine pit (Martin, et al., 1988, p. 29).

Based on the above assumptions, Martin, et al. show that there are about 3,000 wells in the area subject to impact by current and anticipated mining in Wyoming's Powder River Basin. Of these, about 1,200 wells are outside the actual mine areas (i.e., will not be removed by mining). About 1,000 of these supply water for domestic or livestock uses, and about 200 supply water for other uses. The remaining 1,800 wells are used by coal-mining companies: about 1,700 wells are monitor wells only, and the other 100 are used for water supply and/or dewatering at mine sites.

Of the 1,200 water-supply wells subject to impact, about 580 are completed in the Wasatch aquifer, about 100 in the Wyodak coal aquifer, and about 280 in strata below the coal. There is no completion data available for the remainder of these wells (about 240). They could be completed in any of the above aquifers.

Since the actual 10 year drawdowns lie well within the cumulative drawdown predicted by Martin, et al.(1988), the cumulative impacts to water wells have not reached the levels described in that report.

The additional groundwater impacts which would be expected as a result of extending mining as proposed in the LBAs received to date would be to extend the drawdown areas in the area surrounding the proposed new leases. The actual drawdown contours for the mines which have proposed LBAs to maintain their current operations to date are well within the cumulative drawdown anticipated in the report by Martin, et al., 1988, and some recharge was already occurring in 14 of the 15 backfill wells drilled by those mines in 1990. Therefore additional significant impacts in water level drawdown for the maintenance leases is not anticipated. The anticipated groundwater impacts for the proposed new start Rocky Butte mine are considered in the CHIA (Martin, et al., 1988). The addition of the West Rocky Butte tract could extend the drawdown area incrementally. An EIS which includes groundwater modeling is currently being prepared to evaluate the impacts of leasing the West Rocky Butte tract.

3. Potential water-level decline in the sub-coal Fort Union is the third major groundwater issue. According to the Wyoming State Engineer's records, fourteen mines hold permits for 42 wells which are between 400 feet and 10,000 feet deep. That number does not represent the actual number of wells potentially completed in the Tullock, because the zone of completion of these wells is not specified, and not all of the wells are currently producing (for example, three of the permits are held by an inactive mine, and one of the wells Black Thunder

has permitted has not been used since 1984). The State Engineer's Office is currently conducting a study of sub-coal Fort Union water use (personal communication, Dave McElhaney, 10/4/91).

Water-level declines in the Tullock have been documented in the Gillette area. According to Crist (1991), these declines are most likely attributable to pumpage for municipal use by Gillette and for use at subdivisions and trailer parks in and near the city of Gillette. Most of the water-level declines in the sub-coal Fort Union wells occur within one mile of the pumped wells (M.A. Crist, in Martin, et al., 1988, p. 30). The mine facilities in the Powder River Basin are separated by distances of a mile or more, so little interference between mine supply wells would be expected.

In response to concerns voiced by regulatory personnel, several mines have conducted impact studies of the sub-coal Fort Union Formation. The OSM commissioned a cumulative impact study of the sub-coal Fort Union Formation to study the effects of mine facility wells on this aquifer unit (McIntosh, et al., 1984). Conclusions from all these studies are similar and may be summarized as follows:

1. Because of the discontinuous nature of the sands in this formation, and because most large-yield wells are completed in several different sands, it is difficult to correlate completion intervals between wells.
2. In the Gillette area, water levels in this aquifer are probably declining because the city of Gillette and several subdivisions are utilizing water from this formation (Crist, 1991). (Note: Gillette is using this water as a back-up source at this time.)
3. Because large saturated thicknesses are available in this aquifer unit, generally 500 feet or more, drawdowns of 100 to 200 feet in the vicinity of a pumped well would not dewater the aquifer.

The mines adjacent to the five currently proposed LBAs all have permits from the State Engineer for deeper wells. Extending the life of these mines would result in additional water being withdrawn from the Tullock. The additional water withdrawals would not be expected to extend the area of water level drawdowns over a significantly larger area due to the discontinuous nature of the sands in the Tullock aquifer.

The only potential impact to Gillette's water supply as a result of leasing the five LBAs adjacent to current mines would be an indirect one related to the fact that issuing these leases would extend the duration of mining operations at the five mines. Many of the mine employees in the eastern Powder River Basin live in or near Gillette, and are city or county water users. Contact with the city (Fritzler, Gillette City Utilities, 1991) and Campbell County (McDill, Campbell County Engineer, 1992) indicate that the position of the city and county is that there

is an adequate water supply for the city and county if these five LBAs are leased as proposed.

There would not be significant impact to the water supply of the city of Wright as a result of leasing the proposed LBAs. According to the State Engineer's Office, the only permitted wells drilled below 1000 feet in a 100 square mile area surrounding Wright are four wells permitted to the city of Wright (Stockdale, State Engineer's Office, 1992). As discussed above, Crist (in Martin, et al.) indicated most of the water level declines in the sub-coal Fort Union wells occur within one mile of the pumped wells.

The impacts of the new start mine at Rocky Butte on the Tullock aquifer will be considered in the EIS being prepared for the West Rocky Butte tract.

The Tullock member of the Fort Union Formation is the lowermost unit in the formation, and it crops out at the surface east of the area being mined. Therefore any recharge to the Tullock member from the outcrop area is not affected by mining.

4. The fourth issue of concern with groundwater is the effect of mining on the water quality. Specifically, what effect does mining have on the water quality in the surrounding area, and what are the potential water quality problems in the spoil aquifer following mining?

Ground-water quality in areas surrounding the mines is not impacted during mining. While the pits are open, ground-water flow directions are toward the pit, and there is no mechanism for contaminants to migrate off-site, even if contaminants were introduced into the ground water.

In a regional study of the cumulative impacts of coal mining, the median concentrations of dissolved solids and sulfates were found to be larger in water from spoil aquifers than in water from either the Wasatch overburden or the coal aquifer (Martin, et al., 1988). This is expected because blasting and movement of the overburden materials exposes more surface area to water, increasing dissolution of soluble materials, particularly when the spoil materials were situated above the saturated zone in the premining environment. On the basis of studies done in North Dakota, it was estimated that at least one pore volume of water must leach the spoil before the dissolved-solids concentration in the water would be similar to the premining dissolved-solids concentration (Houghton, et al., 1987). One pore volume of water is the volume of water which would be required to fill the pore space or open space in the spoil pile following reclamation. The time required for one pore volume of water to pass through the spoil aquifer is greater than the time required for the postmining ground-water system to re-establish equilibrium.

Chemical analyses of 336 samples collected between 1981 and 1986 from 45 wells completed in spoil aquifers at 10 mines indicated that the quality of water in the spoil piles will, in general, meet state standard for use for livestock when recharge occurs (Martin, et al., 1988). The major current use of water from the aquifers being replaced by the spoil piles (the Wasatch and Wyodak-Anderson coal aquifers) is for livestock because these aquifers are typically high

in dissolved solids in their primining state (see Table 4, Martin, et al., 1988). Therefore, the water from the spoil piles will generally be acceptable for its current use, which is for livestock, before equilibrium is re-established.

b. Surface Water.

Cumulative impacts to surface water have not been mentioned as a source of concern during scoping conducted for the currently proposed coal leasing. There are two main issues relating to cumulative surface water impacts:

- a. Possible changes in runoff rates due to changes in precipitation infiltration rates.
- b. Possible changes in surface-water quality.

Some studies indicate that infiltration rates are initially smaller on reclaimed lands than on premining lands. A reduction of up to 29 percent has been found, with this reduction declining over time until the postmining infiltration rates recover to premining levels (Martin, et al., 1988, p. 106)

Since runoff and infiltration rates have an inverse relationship, a reduction in infiltration rates could cause an increase in runoff and, hence, streamflows. Assuming that the runoff from reclaimed areas is 29 percent greater than that from premining areas (based on this change in infiltration rates noted above), USGS determined that major streams in the Powder River Basin would see runoff increases ranging from 0.4 percent for the Cheyenne River to 4.3 percent for Coal Creek (Martin, et al., 1988).

Surface water quality should not be significantly affected by mining, based on studies conducted by the USGS for the Belle Fourche River Basin (Bloyd, et al., 1986, pp. 33-41). Sediment yield should not increase in area streams. Although reclaimed soils may be more erosive for the first few years after reclamation, the larger sediment production would probably not be delivered to area streams due to sediment deposition as a result of flatter slopes on reclaimed lands and sediment trapping by mandated sedimentation ponds.

Impacts to alluvial valley floors (AVF) can include several of the ground and surface-water impacts listed above. Alluvial aquifers can be subject to water-table drawdowns, channels subject to changes in flow patterns, and the interaction between surface water and ground water can be altered. Impacts to designated AVFs are generally not permitted unless the AVF is insignificant to farming or unless the permit to affect the AVF was issued prior to the effective date of SMCRA.

3. Air Quality

Coal mining activities produce particles which can be released in the air. Most of these particles are created as the result of physical forces such as blasting, crushing, and friction

between vehicles and road surfaces. These particles are not considered to be as much of a health hazard as the generally much smaller particles produced by chemical activities such as condensation, absorption and adsorption. Also, the larger (heavier) the particle, the closer to the source it will settle to the ground.

The initial Federal particulate standard was based on all particle sizes which could be trapped using a high volume air pump and a particular type of filter. This was the total suspended particulates (TSP) standard. Recently, the federal standard was amended to account for the greater health risk due to particles less than 10 micrometers in diameter (the PM10 standard). The particulate standard change from TSP to PM10 is more lenient toward mining activities since mining produces mostly larger particles. Monitoring has indicated that at similar distances from the active pit, PM10 levels are one-third those of TSP. The Wyoming State Ambient Air Quality Standard has not changed from 150 ug/m³ for a 24-hour average and only changed from 60 to 50 ug/m³ for the annual average. Therefore, the WDEQ has kept the 24-hour TSP standard in addition to the PM10 standard.

Tables 18 and 19 use the TSP standard in order to assess how well the previous regional impact assessments fit the current actual impacts. While it was not possible to predict with exact certainty which specific mines would be developed and what their size would be, the overall number and productivity of the mines in the Eastern Powder River Basin was projected with remarkable accuracy from 1979 to 1990.

Particulate emissions are controlled by the amount of regulation imposed as well as by coal production. It would be expected that the actual emission rates would be less than the projected emission rates since regulations have become more strict during this time period. In particular, treatment of haul roads and stock piles, covering of conveyors, and more rapid revegetation of disturbed areas have become the norm rather than just used in special cases.

As can be seen from the tables, the ambient concentrations across the region are usually well under past and current standards. With the major current standard being for finer particles which settle out more slowly, the area of potential cumulative impacts (the area where monitoring would pick up concentrations of 1 ug/m³ as a result of all contributing sources) may be greater.

Since most large particles from mining processes drop out of the air quickly, cumulative impacts tend to occur only when the mine operations are within about 10 miles of each other. The trend over the past 10 years and with the currently proposed maintenance tracts is for the mines to spread apart, increasing the distance between them. In the case of a mine being developed as a new mine start, this trend would be reversed.

The West Rocky Butte lease application could lead to a new mine start. An EIS is being prepared on that application in which air quality impacts of a new mine start will be evaluated. Overall coal production would decline sooner in the area without these new leases, and consequently air quality would probably improve.

Table 18. Particulate Concentration by Mine in the Eastern Powder River as projected for 1990 and as Measured¹ for 1990 for the Annual Ambient Air quality Standard

Mine Name	Projected 1990 Annual Avg TSP Concentration ² ug/m ³	Measured 1990 Annual Avg TSP Concentration ³ UG/M ³
Antelope	20-40	29
Belle Ayr	20-40	40
Black Thunder	20-40	46
Buckskin	20-40	33
Caballo	20-40	33
Caballo Rojo	20-40	29
Clovis Point	20-40	Idle
Coal Creek	20-40	22
Cordero	20-40	43
Dave Johnston	20-40	28
Dry Fork	20-40	28
Eagle Butte	20-40	32
Fort Union	20-40	29
Jacobs Ranch	20-40	40
North Antelope/Rochelle	20-40	31
Rawhide	20-40	30
Wyodak	20-40	29
Average		33

¹ WDEQ.

² The technical report for the 1979 EIS with values for individual mines was not available at the writing of this draft, but the technical report for the 1984 EIS projected that mines south of Gillette would be between 30 and 40 ug/m³ and those north of Gillette would span a greater range of between 20 and 40 ug/m³.

³ Average of all sites making measurements in 1990 with 40 or more observations.

4. Socioeconomics

Five of the six proposed LBAs received to date are maintenance type lease applications. As a result, it is not anticipated that issuance of these leases will result in additional socioeconomic impacts in the area. They will extend the period of employment for workers at these mines, and will therefore increase income and employment over time in the area. They will not result in an increase in numbers of people employed in the area. The Rocky Butte LBA will result in a new mine start if approved. This would add approximately 250 to 300 new jobs to the area. There are two other proposed projects which may be under construction at the same time as the

Rocky Butte Mine. These projects are: a proposed Black Hills Power and Light Company power plant and the second phase of construction scheduled at the Dry Fork Mine. These projects overlap as currently scheduled. The following discussion describes the current situation in the area of Gillette.

Table 19. Particulate Emissions by Mine in the Eastern Powder River Basin as Projected for 1990, and as Estimated from Actual Mining Activities in 1990

Mine Name	Projected 1990 Particulate Emission Rates (tons/year) ¹	Actual 1990 Particulate Emission Rates (tons/year) ²
Antelope		228
Belle Ayr	4520	2127
Black Thunder	3744	1912
Buckskin	1276	531
Caballo	3651	1126
Caballo Rojo		2701
Clovis Point	1492	Idle
Coal Creek	3432	1383
Cordero	9241	2477
Dave Johnston	961	
Dry Fork		750
Eagle Butte	3096	1101
Fort Union		278
Jacobs Ranch	3149	1869
North Antelope/Rochelle	2318	471
Rawhide	2218	1388
Wyodak	682	338
Total	39780	18680

¹ PEDCo, 1983.

² Tentative figures from various regional EISs, to be checked with the WDEQ.

With a colorful early history of cowtown/boomtown conditions, Gillette lies in the heart of the Powder River Basin. With a 1990 population of 17,635 people, it lies in the center of Campbell County and is the largest town in northern Wyoming. Folklore suggests that this is cowboy country with its surrounding high plains and ranches. It was at one time in the early

decades of this century, but this has changed and today relatively few people work in agriculture. Instead, it has a coal mining, petroleum and energy related based economy. In 1989, this helped Campbell County lead Wyoming in coal and oil production and make it 8th in gas production with assessed mineral valuations of over \$1.2 billion or nearly 1/3 of total state mineral valuation (Wyoming Oil & Gas Conservation Commission, 1989; Hoffman, 1990).

Based on data supplied by the Wyoming Dept. of Employment, Campbell County's labor force stood at 16,705 workers in July 1991, with 15,859 people employed. The July 1991 unemployment rate for Campbell County was at 5.1 percent, virtually the same as it was in July 1990 (Wyoming Labor Force Trends, Sept. 1991). This represents a higher figure than the State's 3.8 percent rate in 1991, and 3.9 percent rate in 1990. Although labor force figures are reflected for Campbell County, the figure largely represents Gillette, which makes up 60 percent of the County's population, with some employment being reflected for Wright, a community of about 1,200 people, and other very small communities.

Total personal income in Campbell County in 1989 amounted to \$500.7 million up nearly 43 percent from the 1980 level. This increase far exceeded the State's 28 percent gain in total personal income during the same timeframe.

In 1980 Campbell County's per capita personal income amounted to \$13,918, in 1989, it was \$15,663 representing a near 13 percent increase, lower however, than the State's 28 percent increase during the same period (Wyoming Income and Employment Report, 8/91).

Based on the most current information on housing availability in Gillette, there are about 549 housing units available, mostly single family and rental properties (Table 9).

In addition, Gillette can provide 851 rooms for workers, visitors tourists etc. through 12 motels and hotels located within the city (Gillette Economic Development Corp., 1991). Typically, these rooms range from \$27 to \$40 per night. It also has 39 restaurants, cafes and other eating establishments throughout the city for the worker and visitor (Gillette Economic Development Corp., 1991).

According to Campbell County School District 1991/92 first day attendance data, this school system is being used at nearly 68 percent of capacity based on fall attendance of 7,157 pupils (less kindergarten) and an enrollment capacity of 10,566. With kindergarten included this enrollment figure climbs to 73.6 percent of capacity. Based on this information, the school system could handle another 2,788 to 3,409 students.

In regard to utilities, Gillette appears to have the ability to provide additional services to many hundreds of new customers. For example, the average water usage in Gillette amounts to about two million gallons a day, with peaks of 7-9 million gallons during the summer months (Gillette City Utilities, Fritzler, 1991). This amounts to 730 million gallons (2240 acre-feet) per year. However, at this time deliverable water capacity stands at 11 million gallons of water per day (4015 million gallons or 12,322 acre-feet per year). The city serves 18,300 customers that

consume an average of 165.4 gallons of water per day (Gillette City Utilities, Fritzler, 1991).

Gillette's wastewater treatment facility was upgraded in 1989. This constituted the final phase of their improvement program. The average daily throughput is 2.4 million gallons per day, against a plant capacity of 3.85 million gallons a day (Gillette City Utilities, Schultz, 1991).

In 1990, electrical peak capacity in Gillette amounted to 38.76 megawatts of power (Gillette City Utilities, Lindgren, 1991). This is not locally produced energy but bought power from two or more sources. For example, 60 percent of their power is purchased from Black Hills Power & Light Company located in Rapid City, S. D. (Gillette City Utilities, Lindgren, 1991). Another source of energy is from the Western Area Power Administration. Service is provided for 6,500 homes in the area including business establishments. If the need arises, they could buy up to 60 megawatts of power without major modifications to their system. Usage stands at about 15 million kilowatts of use that translates into about 29.5 megawatts of capacity, far below the 1990 peak (Gillette City Utilities, Lindgren, 1991). If 400 new homes were to be built within the area, about 2.3 megawatts of additional power would be needed (Gillette City Utilities, Lindgren, 1991).

Crime rates, marriage and divorce rates, and birth and death rates are indicators of well being in communities. These topics are discussed in the following paragraphs.

Between 1980 and 1989, the crime rate in Campbell County decreased 30.6 percent. Large decreases were witnessed in burglary, robbery and motor vehicle theft while a 114 percent increase was seen in aggravated assault from 49 to 105 incidents. Note the dramatic increase in law enforcement personnel over this timeframe in Table 20 below.

Table 20: Crime in Campbell County, 1980 and 1989

Type of Crime	1980	1989
Murder	1	2
Rape	9	7
Robbery	13	0
Aggravated Assault	49	105
Burglary	267	153
Larceny	979	850
Motor Vehicle Theft	91	53
Total	1409	1170
Crime Rate/10,000 Inhabitants	578.3	401.4

Law Enforcement Personnel		
Sheriff's Dept.	43	100
Gillette	44	50
Total	87	150

Source: Uniform Crime Reporting, Crime in Wyoming Jan through Dec. 1980, and 1989. Office of the Attorney General.

In 1980 the marriage rate in Campbell County was 13.7 per 1,000 population, in 1989 it had declined to 8.0 per 1,000 population. Note comparisons with the U.S. and Wyoming rates in Table 21 below.

In 1980, the divorce rate in Campbell County was 9.2 per 1,000 population, in 1989 it had declined to 6.4 per 1,000 population. Again, note in Table 21 the comparisons with the U.S. and Wyoming averages.

Table 21: Marriage and Divorce Rates in Campbell County, 1980 and 1989

Category	Subject	1980	1989
Marriages	U.S. Average	10.6	9.7
	Wyoming	14.6	10.1
	Campbell County	13.7	8.0
Divorces	U.S. Average	5.2	4.7
	Wyoming	8.5	6.7
	Campbell	9.2	6.4

Source: Wyoming Vital Statistics, 1981 and 1989, Wyoming Divisions of Health and Medical Statistics (1983)/Wyoming Dept of Health (1991).

In 1980, Campbell County had a birth rate of 29.3 live births per 1,000 population, in 1989 this had decreased to 16.7. Note comparisons with Wyoming figures in Table 22.

In 1980, Campbell County had a death rate of 3.6 persons per 1,000 population, in 1989 it had decrease slightly to 3.5 (Table 22).

There appears to be adequate medical facilities located in Gillette. For example: there is the Campbell County Memorial Hospital located in Gillette. It has a 119 bed capacity and in 1990/91 had 3,056 admissions. It has had a 22 percent occupancy rate (Wyoming Medical Facilities Directory, 1990/91, Wyoming Dept. of Health). Further there is a boarding home in

Gillette, the Pioneer Manor Board and Care Facility, and the Pioneer Manor Nursing and Convalescent Home (Wyoming Medical Facilities Directory, 1990/91).

Table 22: Birth and Death Rates in Campbell County, 1980 and 1989

Category	Place	1980 ¹	1989 ¹
Births	U.S. Average	15.8	-
	Wyoming	22.5	15.1
	Campbell County	29.3	16.7
Deaths	U.S. Average	8.9	8.7
	Wyoming	6.8	7.1
	Campbell County	3.6	3.5

¹ Numbers are reported in number per 1000 population.

Source: Wyoming Vital Statistics, 1981 and 1989.

This information indicates that the city of Gillette can handle a substantial influx of new people without experiencing the "problems" of growth. If all three proposed projects proceed on schedule, there could be some short-term effects on the city of Gillette. These potential impacts will be discussed in more detail in EIS for West Rocky Butte.

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- 1991 "Evaluation of Ground-Water-Level Changes Near Gillette, Northeastern Wyoming", by M.A. Crist. USGS Water-Resources Investigations Report 88-4196.
- In Press "Sedimentology and Depositional History of the Lower Paleocene Tullock Member of the Fort Union Formation, Powder River Basin, Wyoming and Montana", by J.L. Brown. USGS Bulletin 1917-L.

U.S. Office of Surface Mining Reclamation and Enforcement

- 1984: "Correlation and Effect of Mine Facility Wells on the Tullock Aquifer in the Gillette, Wyoming Vicinity." Report to OSM by G.E. McIntosh, C.A. Harrison, and J.O. Wilcox, 1984.

U.S. Soil Conservation Service

- 1987: "National Hydric Soils List and Criteria." National Technical Committee for Hydric Soils.
- 1990: "Revision to Hydric Soils Criteria." National Bulletin No. 430-1-3. January 2, 1981.
- 1991a: "Soil Survey of Campbell County, Wyoming." Unpublished, in progress. Current mapping and soils information available at the SCS office in Gillette, Wyoming.
- 1991b: "Hydric Soils List, Campbell County, Wyoming; Southern Part (SS605)." April 10, 1991.
- 1991: Personal interview with P.S. Derr, SCS State Soil Scientist, by J. Nyenhuis, June 23, 1991.

University Survey of Wyoming

- 1974: "Characteristics of Wyoming Stock-Water Ponds and Dike Spreader Systems." Smith, Verne E., July 1974. Water-Resources Series No. 47.
- 1991: May 22, 1991 interview, Bret Moline, Extension Service, Agriculture Department.

Western Water Consultants

- 1987 "Modeling of Potential Cumulative Drawdowns in the Coal Aquifer at the Thunder Basin Coal Company Black Thunder Mine". Western Water Consultants, August, 1987.
- 1991 "Wetland Inventory, Thunder Basin Coal Company, Black Thunder Mine". Western Water Consultants, November, 1991.

Weston County

- 1991: May 22, 1991 interview, Donna Bunch, Weston County Development.

Wyoming Coal Information Committee

1991: "A Concise Guide to Wyoming Coal." Wyoming Coal Information Committee, Gillette, Wyoming, 1991.

Wyoming Geological Association

1989 "Coalbed Methane in Wyoming", by R.H. DeBruin and R.W. Jones. W.G.A. Guidebook on Gas Resources of Wyoming, p. 97-104.



COMMENTS ON THE WEST BLACK THUNDER DRAFT ENVIRONMENTAL ASSESSMENT

Ninety-two letters were received commenting on the West Black Thunder Draft Environmental Assessment. The commentors included a national Senator and the national Congressman from Wyoming, the Governor of Wyoming, eleven Wyoming Senators and Representatives, the Powder River Basin Resource Council, the Northern Arapaho Business Council, employees of the Black Thunder Mine, landowners whose land is located near the existing Black Thunder Mine, and other interested residents of northeastern Wyoming.

These letters have been numbered and are reprinted on the following pages. Responses to individual letters are indicated by number.

2
CRAIG THOMAS
WYOMING, AT LARGE

3420 (484)
WYUW 118907
LEGISLATIVE OFFICE
LEGISLATIVE HOUSE OFFICE BUILDING
WASHINGTON, DC 20516
202 224-2271
OFFICE OFFICE
Room 4003 Federal Building
Casper, WY 82401-1948
(307) 281-4413
Room 2016 Federal Building
Casper, WY 82401-1823
(307) 773-1481

Congress of the United States
House of Representatives
Washington, DC 20515

November 25, 1991

Mr. Tim Monroe
District Manager
1700 East "E" Street
Casper, Wyoming 82601

Good morning Tim...

I understand the Bureau of Land Management is accepting comment on a lease application for Thunder Basin Coal Company's Black Thunder Mine, and would like to take this opportunity to voice support for your coal leasing efforts in the Powder River Basin. It appears the BLM is following a process that allows leasing, while protecting significant interests. It's important to go forward with Wyoming's coal development, and, unless something shows the lease-by-application process is inadequate, I'm hopeful you can proceed with this, and other leases.

An adequate energy supply is of obvious importance to our country. It's important to Wyoming in terms of the jobs and tremendous economic benefits mining operations provide. Wyoming coal companies have shown a real interest in our state, and proven themselves good stewards of our environment.

Finally, it's in our nation's best interest to promote the production and use of Wyoming coal as much as possible. Growing concern over air pollution, and strong provisions of the Clean Air Act revisions we passed in the last Congress make it vital that low-sulfur Wyoming coal -- called "compliance coal" in the business -- be able to meet market demand in areas of the country working to reduce emissions.

Thank you for the work you're doing on the lease program. I'm hopeful you will be able to move forward with the Black Thunder lease and future coal leasing in the Powder River Basin.

Best regards,


Craig Thomas
Member of Congress

CT:bb

1
FIELD OFFICES
Casper 341-6171
Cody 332-2477
Cow 432-7111
Dakota 442-7081
Laramie 344-1001
Toll Springs 383-8078

3420 (484) 4700
ALAN K. SIMPSON
WYOMING
LEGISLATIVE OFFICE
LEGISLATIVE HOUSE OFFICE BUILDING
WASHINGTON, DC 20516
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Room 2016 Federal Building
Casper, WY 82401-1823
(307) 773-1481

United States Senate
WASHINGTON, DC 20510-5002

November 22, 1991


James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, Wyoming 82601

Dear James:

This letter is written in response to the public comment notice for Thunder Basin Coal Company's lease-by-application (LBA) for additional coal reserves in the Powder River Basin. The purpose of this letter is to support not only Thunder Basin Coal Company's application, but to also support the lease-by-application process in general. This process enables existing mines to lease additional coal reserves, preserve important jobs in Wyoming, and sustain revenues to the State of Wyoming.

The fact that the State of Wyoming is currently the number one coal producing state is an important contribution to a nation that is so highly dependent on foreign imports to meet our energy demands. In addition, it is important that coal reserves of various thermal contents be available on the market as midwestern and eastern utilities determine how to comply with the Clean Air Act Amendments of 1990. Now, more than ever, it is important that Wyoming coal be available for energy production and improved air quality nationwide.

It has been proven again and again that coal mining can successfully coexist with the natural environment in Wyoming. Leasing of additional coal reserves by the lease-by-application process is a proper and prudent policy that benefits Wyoming and the Federal Government. I support your continued efforts to proceed in a proper and thorough manner, to address all concerns, and ultimately, to issue the necessary leases.

With best regards,

Most sincerely,

Alan K. Simpson
United States Senator

AKS/lg

Response to Letters 1 and 2, from Senator Alan Simpson and Congressman Craig Thomas

The BLM realizes the importance of coal to the state of Wyoming and to the country, and believes that the lease by application process is resulting in an adequate evaluation of the impacts of additional leasing on the environment. The Senator's and Congressman's comments in support of the process will be taken into consideration in the Decision Record.

3



United States Forest Service Department of Agriculture

Douglas Ranger District Medicine Bow National Forest and Thunder Basin National Grassland 809 South 9th Street Douglas, Wyoming 82633

3-10(LB) WYU 118207

Reply to: 2800 Date: November 27, 1991

Mr. James Monroe USDI-Bureau of Land Management Casper District Office 1701 East 'E' Street Casper, WY 82601

Dear Mr. Monroe:

I am writing in response to the current controversy concerning the two recent BLM proposals on the Kerr-McGee and Thunder Basin Coal Co coal lease applications. We, on the Douglas District, support your concept of the [unclear]-application process and are willing to assist you in any way we can.

As you well know, the Forest Service has been involved with six of the operating coal mines in the Powder River Basin for well over a decade. Our relationship with these companies has been extremely professional. They have consistently proved themselves to be leaders in reclamation efforts. Many of them have gone far beyond legal requirements to research the methods and results of their work. I believe they are well aware of their role in reclamation of mined lands and are extremely conscious of environmental impacts of their planned operations. They are a pleasure to work with and I believe they are doing their best to conduct their business in accord with high environmental standards.

Sincerely,

Donald A. Heiser District Ranger

CASPER BLM DEC 2 1991 routing slip with initials and dates



Caring for the Land and Serving People

FS-4200-2817-821

4



United States Forest Service Department of Agriculture

Rooky Mountain

Medicine Bow National Forest 605 Skyline Drive Laramie, WY 82070-6093

3-10(LB) WYU 118207

CASPER BLM DEC 20 1991 routing slip with initials and dates

Reply to: 1950-4-2 Date: DEC 18 1991

James W. Monroe BLM, Casper District Office 1701 East 'E' Street Casper, WY 82601

Dear Mr. Monroe:

In response to your request for public comments (Letter dated October 28, 1991), being a Cooperating Agency (40 CFR 1501.6), and in accordance with 40 CFR 1503.1, "Inviting comments," and 1503.2, "Duty to comment," I offer the following comments on the Draft Environmental Assessment for the West Black Thunder Coal Lease Application for your consideration.

The overall document appears to be well organized and clearly written, and reflects a concerted professional effort to meet the intent of NEPA and other Statutes, Regulations, and Plans.

This document provides an example of the high level of quality that can be achieved when agencies cooperate and work toward the common objective of managing the public lands that have been entrusted, while protecting and enhancing the resources of those lands for the benefit of all people.

We appreciate the opportunity to be involved in the development and final review of the analysis and documentation of this proposed action.

Ronald G. Heath Forest Supervisor



Caring for the Land and Serving People

FS-4200-2817-821

Response to Letters 3 and 4, from the U.S. Forest Service

The U.S. Forest Service is the surface management agency for lands in the proposed West Black Thunder tract which are part of the Thunder Basin National Grassland. The Decision Record on the West Black Thunder EA will be signed by the Forest Service as well as the BLM. Their concurrence on the process and on the EA is necessary for the process to continue.



MIKE SULLIVAN
GOVERNOR

STATE OF WYOMING
OFFICE OF THE GOVERNOR
CHEYENNE 82002

December 4, 1991

Mr. James W. Monroe *JW*
BIM Casper District Office
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe:

Agencies of the State of Wyoming have reviewed the Draft Environmental Assessment (DEA) for the West Black Thunder Coal Lease Application. Enclosed for your consideration and use are comments resulting from that review. By this letter, I will inform you that the official position of the State of Wyoming is one of support for the preferred alternative as described in the DEA. I will also clarify two points raised in the comment letter submitted by the Wyoming Game and Fish Department (WGFD).

On page 2, item 2) of the WGFD letter, there occurs a discussion of mining impacts as they relate to "topographic diversity and conversion of a shrub-steppe community to a simpler grassland community." So there is no misinterpretation, the Wyoming shrub standard passed by the Wyoming Legislature last session is the controlling state policy with regard to reclamation shrub densities.

Item 3) on the same page discusses access needs for big game harvest in the mine area. Any additional access acquired through land purchase, lease or easement acquisition should be on a voluntary, willing buyer-willing seller basis. This comment should not be construed to indicate that the State of Wyoming suggests that approval of the lease application be conditioned upon additional access acquisition.

The State of Wyoming appreciates the opportunity to review the Draft EA. Please keep this office informed as to further developments.

With best regards, I am

Very truly yours,

Mike Sullivan

MS/rm
Enclosures
cc: State Review Agencies

Response to Letter 5, from the Governor of Wyoming

The BLM appreciates the involvement and support of the state in the current coal leasing effort. Comments by the Governor and state agencies have been incorporated in the environmental assessment to date, and will be considered in the Decision Record.

WYOMING
GAME AND FISH DEPARTMENT



DEC 2 1991

December 2, 1991

EIS 6631
U.S. Department of the Interior
Bureau of Land Management
Casper District Office
Draft Environmental Assessment
West Black Thunder Coal Lease
Application
SDN: 91-129
Campbell County

Rod Miller
State Planning Coordinator's Office
Herschler Building, 4th Floor East
Cheyenne, WY 82002

Dear Mr. Miller:

The staff of the Wyoming Game and Fish Department has reviewed the draft environmental assessment for the West Black Thunder Coal Lease Application. We offer the following comments for your consideration.

On 13 May, 1991, we received a scoping request for comments on the West Black Thunder Coal Lease. In a letter dated 23 May, 1991, we identified no essential wildlife issues based upon information provided in the request. A comprehensive wildlife study will be submitted in the amendment application which must be approved under the Wyoming State Coal Program to authorize mining within the lease area. Standard mitigation procedures are available to resolve most of the wildlife conflicts likely to develop on the lease area.

On 5 November, 1991, we received a draft environmental assessment for the West Black Thunder Lease Application. The BLM has identified four Alternatives. The preferred alternative is to issue the lease as a maintenance tract for an existing mine, in accordance with the 1989 decision to designate the Powder River Coal Production Region. The tract encompasses 3225 acres within and along the west boundary of the existing Black Thunder Mine. Option A would also add 280 acres of mineable reserves between the proposed lease and Highway 450, that would otherwise be bypassed.

The lease area is classified as winter/yearlong antelope range, unoccupied mule deer range (except for a corridor of yearlong habitat along Little Thunder Creek), and unoccupied elk range. One small sage grouse lek occurs in NE1/4 Sec 31, T43N, R72W. Eight ferruginous hawk nests and one

Headquarters: 1400 State Boulevard, Cheyenne, Wyoming 82002

Mr. Rod Miller
December 2, 1991
Page 2 - EIS 6631

golden eagle nest are located within the lease area. No habitat crucial to the survival of a threatened or endangered species occurs there, although bald eagles commonly winter in the vicinity. Habitat types include grassland, mixed sagebrush grassland, and sagebrush shrubland. Mining will disturb approximately 144 acres of playas with hydric soils. Topography is gently rolling to rolling.

After reviewing this draft environmental assessment, we have identified the following concerns:

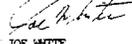
- 1) On page vi, the EA indicates the lease area occupies 3225 acres and an additional 280 acres may be added under Option A. On page 51, it is indicated 3725 acres will be disturbed within the lease area and an additional 400 acres would be disturbed under Option A. How can the area of affected surface exceed the lease area by so much? This discrepancy should be corrected.
- 2) The analysis of impacts to wildlife resources on page 55 is unsatisfactory. The BLM generally contends wildlife will displace from mining disturbance, with no significant population impacts. This assumption is not valid when viewed from a cumulative standpoint. Two unavoidable impacts of mining include a substantial reduction of topographic diversity and conversion of a shrub-steppe community to a simpler grassland community. Both alterations may have far reaching effects on the regional wildlife community. The EA should provide a discussion of the impact these topographic and vegetation alterations might have on regional biotic diversity and carrying capacity for wintering big game herds. The BLM should provide both site-specific and cumulative analyses.
- 3) There are currently eight coal mines operating within the Highlight Herd Unit which account for 12 percent of the occupied habitat. At least five additional sections of land associated with the West Black Thunder Coal Lease could potentially be withdrawn from rifle hunting. Closed surfaces become refuges which draw additional animals from surrounding areas where they might otherwise be accessible to hunters. This compromises the ability of the WGF to maintain herd objectives, which may lead to overpopulation, range over-utilization, and an increase in wildlife damage claims. To alleviate the cumulative impact of hunting closures, we recommend the following mitigation procedures:
 - a) Hunting should be allowed within the Black Thunder permit area throughout the life of the operation. Only the minimum area necessary for safety considerations should be closed.
 - b) The coal company, in cooperation with the BLM, USFS, and WGF, should lease additional lands within Hunt Area 24 to facilitate public access. Easements across private surfaces to previously inaccessible public lands should be given priority.

Mr. Rod Miller
December 2, 1991
Page 3 - EIS 6631

We have identified no other essential issues requiring analysis in this environmental assessment.

Thank you for the opportunity to comment.

Sincerely,


JOE WHITE
DEPUTY DIRECTOR

JW:TC:as
cc: Game Division
Fish Division
HATS Division
USFWS

Response to letter 6, from the Wyoming Game and Fish Department

The Game and Fish Department identified three concerns with the Draft West Black Thunder Environmental Assessment.

Concern 1: The Game and Fish Department refers to the discrepancy between the area of the lease shown on page vi and the projected area of disturbance shown on page 53. On page 53 of the draft EA, it states "It is estimated that about 3725 acres of soil resources would be disturbed in the proposed WBT lease area and adjacent disturbance areas under the proposed action,". This area referred in this statement is the area of the lease, plus the additional area which will be disturbed in order to mine to the edge of the lease. That is the reason for the discrepancy between the size of the proposed lease and the estimated area of disturbance.

Concern 2: There are several agencies involved in the Federal Coal Management Process. The BLM is the Federal agency charged with the responsibility of leasing Federal coal. Once the coal is leased, the U.S. Office of Surface Mining Reclamation and Enforcement (OSM) has regulatory primacy over the reclamation of surface mining activities. In Wyoming, OSM has entered into an agreement with the state government to develop state specific guidelines and standards for the reclamation of coal mines. This program is administered by the Wyoming Department of Environmental Quality. The DEQ has developed the surface mining permitting process and set the standards and guidelines for these activities in this state.

As part of BLM's processing of Federal coal lease applications, we do perform a NEPA analysis and documentation prior to leasing. A principle concern in this step of the process is that we (BLM) do not foreclose any environmental management options that could and should be addressed at other points in the process by other agencies.

The Game and Fish letter raises specific concerns about treatment of topographic diversity and shrub composition in post-mining reclamation. Both of these issues are outside the realm of BLM's direct regulatory authority. They are dealt with by OSM and DEQ. As pointed out by the Governor in his comment letter, the standard passed by the Wyoming legislature is the controlling state policy with regard to reclamation shrub density.

The West Black Thunder EA considers topographic and vegetative impacts and this analysis does not indicate any substantial problem with meeting the state topographic and vegetative requirements. The BLM must deal with the regulations as they currently exist. The BLM is not currently challenging these standards, and does not currently plan to develop a new and separate agency position or evaluation standard regarding topographic diversity or shrub composition of revegetation in reclamation of surface mines areas.

With regard to the cumulative analysis, the cumulative impacts to wildlife are considered in the cumulative analysis section of the West Black Thunder EA. The BLM estimates that a small percentage of the available wildlife habitat in Campbell and Converse Counties is included in the already existing leases and in the proposed LBAs. If all the leased acreage and acreage

proposed for leasing is mined and reclaimed, most of the existing habitat in Campbell and Converse Counties will be unaffected by past, current, and future topographic and vegetative reclamation alterations.

Concern 3: The BLM feels this issue should not be a leasing issue. If the Game and Fish Department has concerns over problems with hunting access, it would be best if they deal directly with the companies and the landowners concerned. The Governor stated that the state of Wyoming is not suggesting that approval of the lease application be conditioned upon additional access acquisition.

*Office of Industrial Siting Administration*1ST FLOOR EAST HERSCHLER BUILDING CHEYENNE, WYOMING 82002 TELEPHONE: 307-777-7368
FAX: 307-777-6937

MEMORANDUM

TO: Rod Miller, Federal Lands Management Coordinator

FROM: Jay Meyer, Senior Economist

DATE: November 22, 1991

SUBJECT: DEA for West Black Thunder LBA (SIN 91-129)

I have reviewed the Draft Environmental Assessment for the West Black Thunder Coal Lease Application. I agree with the conclusions of the preferred alternative. Offering the West Black Thunder tract to Black Thunder Coal Company on a competitive lease would reduce the adverse social and economic impacts of mining the tract by extending the employment of current mine employees and eliminating the impacts associated with a new mine start. This alternative should be preferred especially in light of the proposed Rocky Butte new mine start and the new coal-fired power plant planned for Gillette by Black Hills Power and Light Company (BHP&L).

I would recommend that the impacts of the new power plant proposed by BHP&L be included in the discussion of cumulative impacts under Chapter IV, subsection E.4. BHP&L has submitted a Request for Waiver of Permit Application with the Industrial Siting Administration for the Nest Simpson Unit #2 30MW coal-fired power plant. We are willing to share information regarding this application with the BLM.

JAM

Response to letter 7, from the Office of Industrial Siting Administration

The Office of Industrial Siting Administration was contacted in response to this comment. That office is sending the BLM information on potential impacts to Gillette as a result of the proposed new power plant planned by Black Hills Power and Light, the proposed expansion of the Dry Fork Mine, and the proposed Rocky Butte new mine start, and that data will be considered in future actions, particularly in the final West Rocky Butte EIS.

Regarding the West Black Thunder lease itself, Mr. Jay Meyer indicated that the Industrial Siting Administration does not have concerns with impacts on Gillette as a result of the proposed action in the West Black Thunder Environmental Assessment.

8
DIVISION OF PARKS
& CULTURAL RESOURCES

Wyoming
Department of Commerce

State Historic Preservation Office
1843 Carey Avenue
Cheyenne, Wyoming 82002-0240
(307) 777-7697
FAX (307) 632-2748

November 6, 1991

Mr. James Monroe
Casper District Manager
Bureau of Land Management
1701 E Street
Casper, Wyoming 82601
ATTN: Jude Carino

COPY

RE: *Draft Environmental Assessment for the West Black Thunder Coal Lease Application (SHPO #0189FRC054)*

Dear Mr. Monroe:

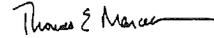
Fred Chapman of our staff has received information concerning the aforementioned DEA. Thank you for giving us the opportunity to comment.

Management of cultural resources on federal coal lease projects is conducted in accordance with Section 106 of the National Historic Preservation Act and Advisory Council regulations 36CFR800. These regulations call for survey, evaluation and protection of significant historic and archeological sites prior to any disturbance. Provided the lead federal agency follows the procedures established in the regulations, we have no objections to the project. Specific comments on the project's effect on cultural resource sites will be provided to the BLM when we review the cultural resource documentation called for in 36CFR800.

On page 31, the DEA states that Native American consultation will take place before the final EA is issued. We strongly recommend that the BLM formally contact tribal governments as well as the appropriate tribal cultural resource consultants. The WSHPO maintains a current list of regional Native American contacts. If you require assistance in notifying tribal authorities, please let us know.

Please refer to SHPO project control number #0189FRC054 on any future correspondence dealing with this project. If you have any questions contact Fred Chapman at (307) 777-8530.

Sincerely,



Thomas E. Marceau
Deputy SHPO

FOR: Dave Kathka, Ph.D., State Historic Preservation Officer

Mike Sullivan
Governor

R.D. "Max" Mustieff
Director
Department of Commerce



Response to letter 8, Wyoming State Historic Preservation Office

A special mailing including copies of the draft West Black Thunder EA was made to Indian Tribes in the state and in the region requesting their comments concerning any religious or cultural areas within or near the West Black Thunder tract. The list of people included in the special mailing can be found in the mailing list preceding the comments in the EA.

Following the letters sent, the BLM received a request for additional information from Mr. Frances Brown, a member of the Wind River Arapaho Tribal Elders. The information he requested was sent, with a request for a response in thirty days. We did not receive further comments from Mr. Brown within the 30 day period (See Letter 24 and responses).



THE GEOLOGICAL SURVEY OF WYOMING

BOX 3008 UNIVERSITY STATION • LARAMIE WYOMING 82071
(307) 766-2286 • FAX 307-766-2605

STATE GEOLOGIST - Gary B. Glass

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---	--	-----------------------------------	---------------------------------	-----------------------------	----------------------------------	----------------------------------

November 19, 1991

--MEMORANDUM--

TO: Rod Miller, Wyoming State Clearinghouse

FROM: Gary B. Glass, State Geologist

SUBJECT: Draft Environmental Assessment for West Black Thunder Coal Lease Application (State Identifier 91-129)

Our only comment refers to page 53 where the DEA mentions "selenium". We suggest that all parties to this project coordinate with the State's selenium research team. A good contact would be Greg Smith at the Land Quality Division of DEQ.

Response to Letter 9, the Geological Survey of Wyoming.

Mr. Greg Smith with the DEQ Land Quality Division was contacted concerning this topic, and the information he provided is incorporated in the Final EA. The Geological Survey of Wyoming's help on this issue is appreciated.

Public Service Commission
 700 W. 21ST STREET CHEYENNE, WYOMING 82002
 (307) 777-7427 FAX (307) 777-4700

MEMORANDUM
 GIL TUCKER, Chairman
 JOHN R. "BOB" BERTY, Deputy Chairman
 STEVE BILLESCHER, Commissioner
 AMIE J. BLUMBERG, Chief Counsel and Commission Secretary
 STEPHEN W. GIBBY, Administrator

TO: ROD MILLER, FEDERAL LANDS COORDINATOR
 STATE PLANNING COORDINATOR'S OFFICE
 FROM: JON JACQUOT, CHIEF ENGINEER
 PUBLIC SERVICE COMMISSION
 DATE: NOVEMBER 26, 1991
 RE: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE WEST
 BLACK THUNDER COAL LEASE APPLICATION

Thank you for the opportunity to comment on this matter. The Public Service Commission requests that no unreasonable restrictions be placed on the provision of utility service or on the construction of utility and pipeline facilities as a result of this coal lease.

The Commission further requests that when utility and pipeline facilities must be moved to accommodate the mining of coal on this lease, the operator of the lease be required to pay for the movement of those facilities. If the operator of the lease does not pay for the movement of those facilities, the general rate paying public must absorb the cost to the utilities for such movement.

If you should have any questions regarding these comments, please let me know.

II

lab



3420 LSA
 WY 118907

November 12, 1991
 Mr. James Monroe
 BLM Casper District Office
 1701 East "E" Street
 Casper, WY 82601

RE: Federal Coal Lease Application WYWI 18907
 Dear Mr. Monroe:

I support the lease-by-application process that is currently being utilized by Thunder Coal Company and other mines in the Powder River Basin. The coal mines in the State of Wyoming have created good jobs (both primary and secondary) and have been an extremely valuable contributor to the Wyoming economy. It is also important to add that mining has been performed in an environmentally sensitive manner and the reclamation efforts have been exemplary. It is important that there be a process by which coal companies, such as Thunder Basin Coal Company, can obtain additional coal reserves, thereby preserving not only the operations and the jobs they provide, but also to extend the important economic contributions to the State of Wyoming.

Sincerely,
 Boyd L. Eddins
 Senator Boyd L. Eddins
 Vice-President

CASPER BLM
 NW 22 '91
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CASPER BLM
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SENATOR MICHAEL J. BURKE
 Natrona County
 213 State Capitol Building
 200 W. 8th Street, Room 4100
 Casper, Wyoming 82601-1825
 307 255-3299
 307 255-8312 FAX
 Committees:
 Judicial
 1989 and Federal Relations

November 19, 1991

MR. JAMES MONROE
 BLM Casper District Office
 1701 East "E" Street
 Casper, WY 82601

re: Federal Coal Lease Application WYWI18907
 West Black Thunder

Dear Mr. Monroe:

This is to express my support of the BLM's Coal Lease-by-Application process, in general, and of Thunder Basin Coal Company's current application, in particular. I do so because of Wyoming's compelling interest in preserving the opportunity for the coal industry to thrive here and because of the ARCO Companies' exemplary corporate citizenship.

The Wyoming Coal Industry's contributions are experienced positively by the State itself and by every community therein. It is vital, therefore, to the State, and to its communities, that that the mines have a process whereby they can obtain additional coal reserves. I consider the lease-by-application process appropriate.

My experience of the ARCO Companies' corporate citizenship dates to the mid-1970s when the community of Wright was being planned and developed. As Gillette City Attorney at that time, I became persuaded that ARCO's is a World Class Act. I have every reason to believe that this corporate ethic continues to be advanced by Thunder Basin Coal Company.

I urge approval of the referenced application. If you have any questions, please contact me.

Very Truly Yours,
 Michael J. Burke
 Wyoming Senate

Not reworked
 3/11
 Jon



SENATOR TERRY L. GUICE
 Hanna County
 213 State Capitol
 Cheyenne Wyoming 82002
 Committees:
 Judicial Chairman
 Revenue
 Minerals, Business and
 Economic Development

November 19, 1991

Mr. James Monroe
 BLM Casper District Office
 1701 East "E" Street
 Casper, Wyoming 82601

Dear Mr. Monroe:

Wyoming is facing difficult times, but one of the bright spots in Wyoming's future is the continued success of the state's coal industry. It is my understanding that your office is currently accepting public comments on Federal Coal Lease Application WYWI18907. Please accept this as a letter of support, not only for this particular application, but for the lease-by-application process in general.

It is important to the people of Wyoming that industry have the ability and opportunity to invest in Wyoming, particularly those companies who are willing to stringently protect the state's environment. The economic contribution these companies have made to Wyoming have been immense, but more importantly they have demonstrated their ability to insure environmental protection.

The record clearly shows that the balance of business and protection of the environment can go hand in hand and benefit the people and wildlife of Wyoming alike. With this in mind I strongly encourage the BLM to move forward and continue the lease-by-application process here in Wyoming.

I appreciate your consideration for my letter. If I may provide any additional information or if you would like to visit regarding this subject, please do not hesitate to contact me.

Sincerely,
 Terry L. Guice
 Wyoming Senator

CASPER BLM
 NW 20 '91
 MN
 FL
 PA
 AO
 OPR
 LRA
 RGR
 SL
 SRA
 NRA
 PRA
 Lead Resd

TLG/ms

11/21/91
 Jon

Wyoming State Legislature

213 Capitol Building Cheyenne Wyoming 82002 Telephone 307-777-1881



3411(LB4)
WY1118907

SENATOR JERRY A. DIXON
Weston County
21 South Summit
Newcastle, Wyoming 82701
Committees:
Transportation and Highways
Labor and Federal Relations

November 20, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: Federal Coal Lease Application WY118907

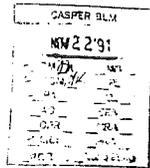
Dear Mr. Monroe:

As the coal mines in the Powder River Basin have touched every community in the State of Wyoming, I am pleased to write in support of Thunder Basin Coal Company's application for additional reserves. The economic contribution of the mining industry will be relied upon by the State of Wyoming for many years to come. It is important that the coal mines have a process by which to obtain additional reserves so that the operations and the jobs they provide will be extended.

As a neighbor to Campbell County, I have had the opportunity to see the mines over the past number of years. It is evident that the mines have had impressive results in the reclamation efforts. The mines have successfully demonstrated that the environmental quality in the State of Wyoming can be protected.

Sincerely,

Jerry Dixon
Senator Jerry Dixon
Majority Floor Leader



JD:ag

Wyoming State Legislature

213 State Capitol Cheyenne, Wyoming 82002 Telephone 307-777-1881



SENATOR KELLY F. MADER
Casper-Johnson Counties
113 East 3rd Street, Suite 1
Casper, Wyoming 82601
307-586-7700 Fax 307-582-3399
Committees:
Appropriations, Chairman
State Chamber
American Legislative
Exchange Council

November 21, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" St.
Casper, Wyoming 82601

RE: Federal Coal Lease
Application WY118907

Dear Mr. Monroe:

Having represented the Powder River Basin for nine years, I know the economics and the issues of the region. The coal mines in particular have established an enviable record of positive economic impact which has been balanced by an exemplary record of environmental protection and enhancement. Both are points that the environmentalists conveniently forget in their opposition to this lease and others.

I know of what I speak. My ranch adjoins the Exxon Carter Sawhide Mine. I live within a couple of miles of the UMI Eagle Butte Mine, the Phillippe Orr Fork Mine and the Shell Buckskin Mine. They have been good neighbors and, by the way, I do not own any coal lands or coal interests nor have I ever.

As Chairman of the Senate Appropriations Committee, I also know the ramifications of curtailing the expansion of our coal industry. Presently nearly 25 percent of Wyoming's income comes from the Powder River Basin. The state's and the nation's financial difficulties will only be exacerbated by the delay of this or any lease.

It is important that we recognize the difference between true environmental protection and economic pillage in the name of environmental protection.

I am strongly in support of Thunder Basin Coal Company's lease application and lease-by-application in general. I urge your expeditious approval.

Sincerely,

Kelly F. Mader
Kelly F. Mader, Senator
Casper/Johnson Counties

Wyoming State Legislature

213 Capitol Building Cheyenne Wyoming 82002 Telephone 307-777-1881



3410(LB4)
WY1118907

SENATOR OTIMER TRUE
President
Natrona County
P.O. Box 2300
Casper, Wyoming 82602
Committees:
Rules and Procedures, Chairman
Management Council
Select Committee on
Legislative Process

November 25, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, Wyoming 82601

Re: Federal Coal Lease Application WY118907

Dear Mr. Monroe:

It is impossible to exaggerate the importance of the minerals industry to the future of Wyoming. By almost any measure, the coal industry in the Powder River Basin has developed and produced this resource in an environmentally sound manner to the benefit of Wyoming residents and the nation as a whole. As a result, I want to clearly express my support for the Thunder Basin Coal Company's coal lease application as well as the other applications filed under the lease-by-application process.

Thank you for your favorable consideration of my views on this very important coal lease application.

Very truly yours,

Otmer True
Otmer True

OT/tas

Wyoming State Legislature

213 State Capitol Cheyenne, Wyoming 82002 Telephone 307-777-1881



SENATOR JOHN PERRY
Casper-Johnson Counties
113 East 3rd Street, Suite 1
Casper, Wyoming 82601
307-586-8955
Fax 307-584-9936
Committees:
Agriculture, Chairman
Government Reorganization
Council, Vice Chairman

91050-6

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

Re: Federal Coal Lease Application WY118907

Dear Mr. Monroe:

As you are probably aware, the State of Wyoming is very dependent upon the mineral industry, including the coal mines, for revenues and jobs. The result is that we enjoy low property taxes, no state income tax and very low sales tax. It is important that existing mines, such as Thunder Basin Coal Company's Black Thunder Mine, have a mechanism by which they can obtain additional coal reserves in order to preserve jobs and maintain operations well into the future. I am therefore writing to support Thunder Basin Coal Company's application, as well as the lease-by-application process in general.

While it is important that we support the mining industry in the State of Wyoming, it is also important that our environmental quality be preserved. I believe the coal mines have successfully demonstrated that mining and preservation of the environment can proceed hand in hand.

Sincerely,

John Perry
John Perry
Senator, Campbell and
Johnson Counties

November 14, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: Federal Coal Lease Application WY118907

Dear Mr. Monroe:

In response to the public comment notice for the West Black Thunder coal lease application, I am pleased to submit this letter of support. As mines in the powder River Basin begin to mature, it is important that the coal mines have a mechanism by which they can obtain new coal reserves and preserve their future. This is an important factor when considering the importance of good jobs in the State of Wyoming and the fact that the economic contribution of the mines are felt throughout the State.

It is equally important to note that the mines have successfully incorporated environmental sensitivity into their daily operations. The reclamation at the mines is truly exemplary.

Sincerely,

Representative John Marton



REPRESENTATIVE E. A. DICK WALLIS
3rd District
2700 Broadway
Cheyenne, WY 82001
Committee:
Agriculture Chairman

Nov. 14, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: Federal Coal Lease Application WY118907

Dear Mr. Monroe:

I wish to submit these comments in support of Thunder Basin Coal Company's coal lease application.

I have lived in Campbell County for 34 years. I have watched the orderly development of the coal mining industry in my county from the very beginning of the coal "boom". I can tell you that this County and the entire State of Wyoming have benefited greatly as a result of the development.

I know from first hand experience that the mines can operate safely and are very successful in protecting the environment. The industry makes many valuable contributions both in economic and in community service considerations.

As a State Legislator I am very aware of the valuable contributions the coal mines have made to the State of Wyoming and I might add that every community in Wyoming enjoys benefits because of coal mining.

I support and encourage the lease-by-application process that is being used by Thunder Basin Coal Company and the other coal mines in the Powder River Basin.

Thank you for this opportunity to comment.

Sincerely,

Dick Wallis
State Representative, Campbell County

November 25, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY. 82601

RE: Federal Coal Lease Application WY118907

Dear Mr. Monroe:

As a long time rancher and a Wyoming State Representative from Campbell County, I would like to extend my support of Thunder Basin Coal Company's coal lease application, as well as supporting the maintenance lease process in general. I have been in Campbell County throughout the development of the coal industry, and have seen Gillette and Wright grow in response to the growth. This growth has been very positive and beneficial to our residents.

The coal industry has been a strong partner with both Campbell County and the State of Wyoming. The industry employs our citizens and provides substantial revenues to Campbell County as well as the State of Wyoming. It is important that these companies have the ability to maintain their operations and the jobs that they provide. The mines have successfully demonstrated that they can operate within Wyoming law and that they can operate in an environmentally sensitive fashion. I encourage the BLM to continue its efforts in leasing additional coal reserves in Campbell County.

Sincerely,

John J. Hines
Representative John Hines



REPRESENTATIVE ELL O. SEBOUT
Franklin County
P.O. Box 111
Cheyenne, Wyoming 82001
Committees:
Corporations, Elections and
Political Subdivisions
Natural Resources and
Economic Development

November 27, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: Federal Coal Lease Application WY118907

Dear Mr. Monroe:

As a member of the Wyoming House of Representatives and member of the House Revenue Committee, I would like to offer my support for Thunder Basin Coal Company's coal lease application. I would also like to support the lease-by-application process. We are fortunate in the State of Wyoming to be blessed with an abundant supply of minerals. The result of mineral production in Wyoming is that we have no State income tax, as well as low property and sales taxes. We need to encourage the existing coal mining operations in the State of Wyoming to continue to invest in Wyoming and employ our citizens. I live in Fremont County and have seen first hand how the loss of jobs can impact a community and it's economy. By allowing the existing coal sites to obtain additional reserves through the lease by application process, we can preserve those important jobs well into the future.

I feel the state has closely monitored the leasing process to ensure that the correct procedure is clearly followed. The lease-by-application process provides a sound mechanism to ensure that all aspects are adequately addressed and that maximum competitive bidding is achieved for our coal reserves. It is my belief that this process as being applied to the Thunder Basin Coal Company's application is sound and should be continued.

Sincerely,

Ell O. Sebout

EES/ksb

cc: Alan Edwards

Response to Letters 11 through 21, from members of the Wyoming Legislature

The BLM appreciates the concerns of the Wyoming legislators in maintaining jobs, coal production, and the quality of the environment in the state of Wyoming. These comments will be taken into account in the preparation of the Decision Record.

3420 L84
WYD 118907



CITY OF GILLETTE

P. O. BOX 3003 - GILLETTE, WYOMING 82717-3003
PHONE (307) 686-5200

November 20, 1991

James Monroe
District Manager
Bureau of Land Management
Casper District
1701 East E. Street
Casper, WY 82601

NOV 24 1991

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Dear Mr. Monroe:

On the behalf of the City of Gillette, I wish to formally express the City's support for Federal Coal Lease Application WY 118907 and titled the West Black Thunder Coal Lease.

We have reviewed the Environmental Assessment for Thunder Basin Coal Company's application and feel that the granting of this lease will have a beneficial long term effect on the economy of Gillette and Campbell County. The proposed lease will add approximately 13 years to the life of the mine and result in recovery of approximately 400 million tons of additional coal.

The maintenance of long term employment will result in projected additional payroll of \$23.5 million per year carrying well into the next century. Without this lease, employment at the Black Thunder Mine could begin to decline as early as 1996.

In addition, an estimated tax revenue of \$250 million in mineral royalties would be paid, of which one-half comes back to the State of Wyoming and a substantial portion of that returns to the local economy.

The Black Thunder Mine has won numerous awards for excellence and achievement in reclamation and environmental protection including a special Merit Recognition Award from the National Environmental Awards Council in 1990.

In summary, we at the City of Gillette, feel that the granting of this permit is vital to the economic health of our City and region and urge its approval by the Federal Agencies responsible.

Sincerely,

E. J. Collins
Mayor

DS/EJC/b

ds:91.135

3420 L84
WYD 118907

Town of Wright
P.O. Box 70
Wright, Wyoming 82732
(307) 464-1666

CASPER BLM	
DEC 4 1991	
— OM —	— MH —
— ADM —	— FI —
— PA —	— SL —
— AD —	— BRA —
— OPR —	— NRA —
— LRR —	— PRA —
— RGR —	— Lead Resp —

December 3, 1991

James Monroe
District Manager
Bureau of Land Management
Casper District
1701 East E. Street
Casper WY 82601

Dear Mr. Monroe:

On behalf of the Town of Wright, I wish to formally express the Town's support for the Thunder Basin Coal Company West Black Thunder Coal lease application. (See attached Resolution 5-91)

We feel that the granting of this lease would extend the life of Black Thunder Mine up to thirteen years and have a beneficial long term effect on the economy of the Town of Wright and Campbell County. Approximately 13 years would be added to the life of the mine.

The maintenance of long term employment would result in projected payroll of \$23.5 million per year carrying into the next century. Without this lease the employment at the Black Thunder Mine could begin to decline as early as 1996. The additional tax revenue of mineral royalties that would come back to the State of Wyoming and the local economy would be approximately \$125 million.

Black Thunder Mine has a tract record of strong community support of the Town of Wright and was instrumental in building Wright. It has won numerous awards for excellence and achievement in reclamation and environmental protection.

Therefore, the Town of Wright feels that the granting of this permit is vital to the economic health of the Town of Wright and Campbell County and urge its approval by the Federal Agency responsible.

Sincerely,

Joe Robidoux, Mayor
Town of Wright

Enclosure

JRdr

Response to Letters 22 and 23, from the cities of Gillette and Wright, Wyoming

The cities of Gillette and Wright, Wyoming will experience the greatest impacts if the West Black Thunder LBA is issued and also will experience the greatest impacts if the lease is not issued. The comments of these cities are important in evaluating the West Black Thunder EA, and their support of the process is important. These comments have been considered in the Final Environmental Assessment and will be taken into account in the Decision Record.

Northern Arapaho Business Council
 P. O. Box 398
 Ft. Washburn, Wyoming 82514
 Phone 332-8120 332-5008 307-456-3481
 CASPER 82401



DEC 16 '91

ADM	MIN
ADM	ADM
PA	SI
AO	NSA
OPR	NSA
LR	NSA
RGR	Land Resp

December 1991
 Mr. James W. Monroe and Ms. Nancy Doeiger
 U.S. Bureau of Land Management
 Casper District Office
 1701 East 'E' Street
 Casper, Wyoming 82601

Dear Mr. Monroe, Ms. Nancy Doeiger, et al.
 The Arapaho Tribe, in response to your West Black Thunder Draft Environmental Assessment inquiry letter dated 15 November 1991, would like to be in a position to answer your initial inquiry, however, at this time we need more accurate information before proceeding.

As you are probably aware, this area is part of what is traditional Arapaho lands, and should include a number of sites that would be definitely of Arapaho origin.

Particularly, we could use a map of 1:100,000 scale showing where the mine and buffer zone will be in conjunction with particularly site 48CA1780, and a more complete copy of your archeological/cultural survey reports). The archeological reports especially pertaining to sites 48CA1780, 481729, 48CA1474, 48CA2481, 48CA 401+402, 48FA91-32, 48PA91-32-P2/H6, PA91-32-P2, and a copy or summary of the 1982 Chapman/Miller Report. The 48CA1780 site having a large circle and being a habitation location fits Arapaho tradition, and we would like much information on that site as possible, especially a photograph of the circle and surrounding area.

If you have any questions, please feel free to call or write.

Sincerely,

 Francis Brown
 Home Phone (mornings) (307) 856-4556
 Member, Arapaho Wind River Traditional Elders
 P. O. Box 601
 Riverton, Wyoming 82501
 Copy: Wyoming SHPO, Tom Marceau

Response to Letter 24

3420 (LB)
WY118907

JAN 17 1992

Certified Mail - Return Receipt Requested

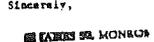
Mr. Francis Brown
 Member, Arapaho Wind River Traditional Elders
 P.O. Box 601
 Riverton, WY 82501

Dear Mr. Brown:

Thank you for your letter of December 2, 1991 requesting additional information regarding cultural resources associated with the West Black Thunder Draft Environmental Assessment. As per your request we are sending you a 1:100,000 scale map showing the existing mine, the application area, buffer zone, and site 48 CA1780. We are also enclosing a copy of the USGS 7.5 minute topographic maps covering the same area with all cultural resources plotted on them. Finally, we are enclosing copies of all sites forms requested and a summary of the 1982 Chapman/Miller report.

The above site location information we are sending should be treated as confidential as this type of information is not given to members of the public. However, because this area is part of traditional Arapaho lands and some cultural resources could be of Arapaho origin, we are sending you all of our information. We respectfully ask that you also treat this as confidential information and not disseminate it for general public consumption.

We hope that the enclosed information will give you the needed information to comment on the proposed environmental assessment. Finally we request that you provide any comments you may have within 30 days of receipt of this information. Should you have any questions or need any further information please feel free to contact Nancy Doeiger at (307) 161-7600.

Sincerely,

 JAMES W. MONROE
 District Manager

Enclosure

Additional response to Letter 24, from the Northern Arapaho Business Council

No further response has been received from the Arapahos following their receipt of the information Mr. Frances Brown requested. Any further requests from the Arapaho tribe will be accommodated if possible.



POWDER RIVER BASIN RESOURCE COUNCIL

23 North Scott • Sheridan WY 82801 • (307) 672-5809

CASPER BLM	
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BY	MM
ADM	FL
PA	SL
AD	BA
OPR	NRA
LAS	PRA
AGR	Lead Reso

December 9, 1991

James W. Monroe
BLM Casper District Office
1701 East E Street
Casper, WY 82601RE: Draft Environmental Assessment for the West Black Thunder
Coal Lease Application (EA # WY061-2-004)

Dear Mr. Monroe:

The following comments are respectfully submitted on behalf of the Powder River Basin Resource Council (PRBRC), the Wyoming Outdoor Council (WOC) and the Wyoming Chapter of the Sierra Club.

NEED AND ALTERNATIVES:

- Alternative No. 1, the action proposed by the BLM, appears to be in conflict with the intent of the Lease by Application process. LBA's are intended to maintain existing levels of production, not expand production. Yet, Black Thunder Mine has applied for revision to expand permitted production for at least three years by approximately 6 million tons annually. This represents a 20 percent increase over current levels production. How does this permit for increased production comply with the current LBA process? Why hasn't the BLM discussed BLM's proposed permitted increase in production?
- Within the alternative proposed by BLM under Option B, is the semblance of an attempt to initiate some competitive bidding by dividing the proposed tract into two tracts. Apparently, Shell Mining has expressed some interest in this portion of the tract. What are the reasons for the BLM not selecting an option that would enhance competition? Competitive bidding and fair return for public resources is one of the two primary concerns in the current round of leasing in the Powder River Basin. It is also a matter than has been of great concern in congressional and DOI investigations over the past decade.
- Additionally, why hasn't the BLM considered as one alternative an

1

the most long lasting and potentially the most threatening. The most recent assessment of water resources in the regional is the CHIA (USGS, 1988) cited in the EA. On pages 156-157, this report strongly recommends further study of potential postmining water quality problems.

- The postmining water quality problem is especially troublesome because of the potential for a longterm and widespread migration of contamination well beyond the proximity of the mine. The EA estimates decades to perhaps centuries before groundwater equilibrium is reestablished, and longer before contamination is leached from the spoils. This contamination then migrates offsite, potentially threatening existing wells or coming to the surface. Yet, there is no discussion of potential impacts to water users and no mitigation plan appears to be in effect to protect future water users. What mitigation is the BLM proposing to minimize this identified problem in the EA?
- The EA notes that water level declines in the coal aquifer would extend one mile further to the west and that drawdowns in the overburden aquifer would also be extending further to the west. The EA also says that the spoil aquifer will cover a larger area if the tract is mined and more time will be required for water levels to recover. How much more time?
- On page 48 the EA states that a regional study of cumulative impacts of coal mining found that the median concentrations of dissolved solid and sulfates were found to be larger in water from spoil aquifers. Was this information based on a regional study of cumulative impacts in the Powder River Basin? How long do you expect that it will take for water quality to return to a pre-mining condition? How many wells will be potentially impacted? What mitigation measures are suggested?
- The EA also states on page 49 that drawdowns will exceed forty feet and cumulative effects are expected from the Jacobs Ranch mine and the North Rochelle mines. What cumulative effects are expected? How do you propose mitigating these cumulative effects?
- On page 50 the EA states that 13 water wells are identified as being impacted. What impacts are expected and what mitigation is suggested to minimize or eliminate these impacts?
- A significant future problem which was only very briefly addressed on page 53 is the potential for the exposure of harmful levels of selenium to plants and animals. What cumulative studies have been undertaken regarding the potential selenium impacts and problems at mines in the Powder River Basin? What mitigation measures to minimize selenium contamination are being proposed?

3

entirely different tract configuration that would enhance competitive bidding for the coal resources in this area?

- Alternative No. 1 Option A, the preferred alternative of the BLM fails to fully evaluate the consequences of this action. The close proximity to Wyoming HWY 450 could present problems during blasting or high winds. The EA notes that prevailing winds are from the NW, but significant southwesterly winds occur in this area, especially during the dry summer months. While significant levels of traffic over this road are to and from the adjacent mines, this is also a through route between Newcastle and Strait and other destinations. The EA should assess the consequences of potential disruptions of traffic along Hwy 450, especially emergency traffic. It should be remembered that while the opening of Black Thunder and Jacobs Ranch Mines was largely responsible for the completion of Hwy 450, it is still a public highway and is not there solely for the benefit of the mining industry.

ENVIRONMENTAL ISSUES

- It is again our position that a comprehensive environmental impact study of the region is needed in light of the leasing and development of over 1 billion tons of coal. This is certainly a significant action and the regulations promulgated under NEPA require an EIS.

While a wide range of environmental impacts are of concern, hydrological impacts are of particular concern due to the very longterm problems that can result from mining.
- The EA relies heavily on information obtained from the monitoring program conducted by the Gillette Area Groundwater Monitoring Organization (GAGMO). GAGMO is essentially a network of various monitoring efforts conducted by the mining industry. While there is no reason to consider all this information suspect, it is also not prudent to rely too heavily on this data without independent verification. The Wyoming Department of Environmental Quality does not rely on GAGMO for the monitoring data because some wells are not reporting accurate data. Additionally, GAGMO has not monitored wells in the Fort Union Formation and recently voted not to monitor those wells.
- With the high level of mineral development in the Powder River Basin, including coal, oil and gas, and uranium development, it is surprising that BLM has not done more to establish groundwater monitoring capabilities to assess drawdowns and impacts on water quality. Certainly DOI, BLM and USGS could and should be more actively assessing these impacts on a continuous basis.
- The EA barely address the issue of postmining impacts on groundwater quality even though these impacts are quite likely

2

- The potential for selenium to contaminate surface water is also an issue of concern. Has the BLM considered this issue? What other impacts or changes might occur to surface water quality? What mitigation is proposed to minimize these impacts?

- In regards to water level declines in the Fort Union Formation what documentation is relied upon to support that statement that "these declines are most likely attributable to withdrawal at subdivisions and trailer parks in and near the city of Gillette." Are there any other water users of wells drilled in the Fort Union Formation near the Black Thunder, Jacobs Ranch or Rochelle mines?

CONCLUSION

The methodology that the BLM is pursuing in addressing these LBA's is unacceptable. With six LBA's pending, developing six separate environmental assessments will probably take more time and effort than preparing a single cumulative environmental impact statement. It would seem logical to have prepared one comprehensive statement addressing the Jacobs Ranch, West Black Thunder and Rochelle-North Antelope LBA's since they are proximate. Addressing these leases separately in a scatter-gun approach hampers rational analysis of the implications of the action and breeds mistrust of the process.

Thank you for your consideration and review of these comments. We look forward to reviewing the final EA.

Respectfully Submitted,

Dana Walters
Powder River Basin Resource Councilcc: Dan Heilig, Wyoming Outdoor Council
Connie Wilbert, Wyoming Chapter of Sierra Club

4

Response to Letter 25, from the Powder River Basin Resource Council, the Wyoming Outdoor Council, and the Wyoming Chapter of the Sierra Club. Numbers in the response refer to numbered paragraphs in the comment letter.

A number of the issues mentioned in Powder River Basin Resource Council's comments are discussed in greater detail in the final EA.

The purpose of the West Black Thunder Environmental Assessment is to evaluate the potential impacts of leasing the coal. It is part of the decision process evaluating whether the coal should be leased or not.

The most likely outcome of leasing the coal is that it will be mined. Therefore, the Environmental Assessment must evaluate whether there are significant impacts to the environment which will occur as a result of mining the coal in the West Black Tract and if they can be mitigated. This evaluation is based on analyses prepared for four previous EISs. Impacts which were not addressed in the previous EISs, but which have been identified during more than ten years of mining must also be considered, along with their mitigation.

The purpose of the West Black Thunder Environmental Assessment is not to define specific mitigation measures which will be taken to prevent specific impacts when the coal is mined. That type of analysis is done in the Permit Application Package and EIS which will be prepared under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) if the coal is leased and a mining permit is applied for. That is the next step in the process.

NEED AND ALTERNATIVES

1.) A discussion of Black Thunder's permitted production levels and temporary permit request should have been included in the West Black Thunder Draft EA, and has been included in the final. Thunder Basin Coal Co. has applied for and received an Air Quality Permit which allows up to 36 million tons of production for the years 1991, 1992, and 1993 only. This permit will allow them to produce more than their previously permitted 30 million tons. The increase applies to existing Black Thunder reserves and not to coal from the West Black Thunder tract. The Black Thunder Mine has been producing at close to their previously permitted level during the last few years. According to the company, this increase would have been requested if they had not applied for the West Black Thunder Tract, because the temporary increase allows them the flexibility to market coal for test burns or to secure new contracts to replace some long-term contracts which will be expiring in the next few years.

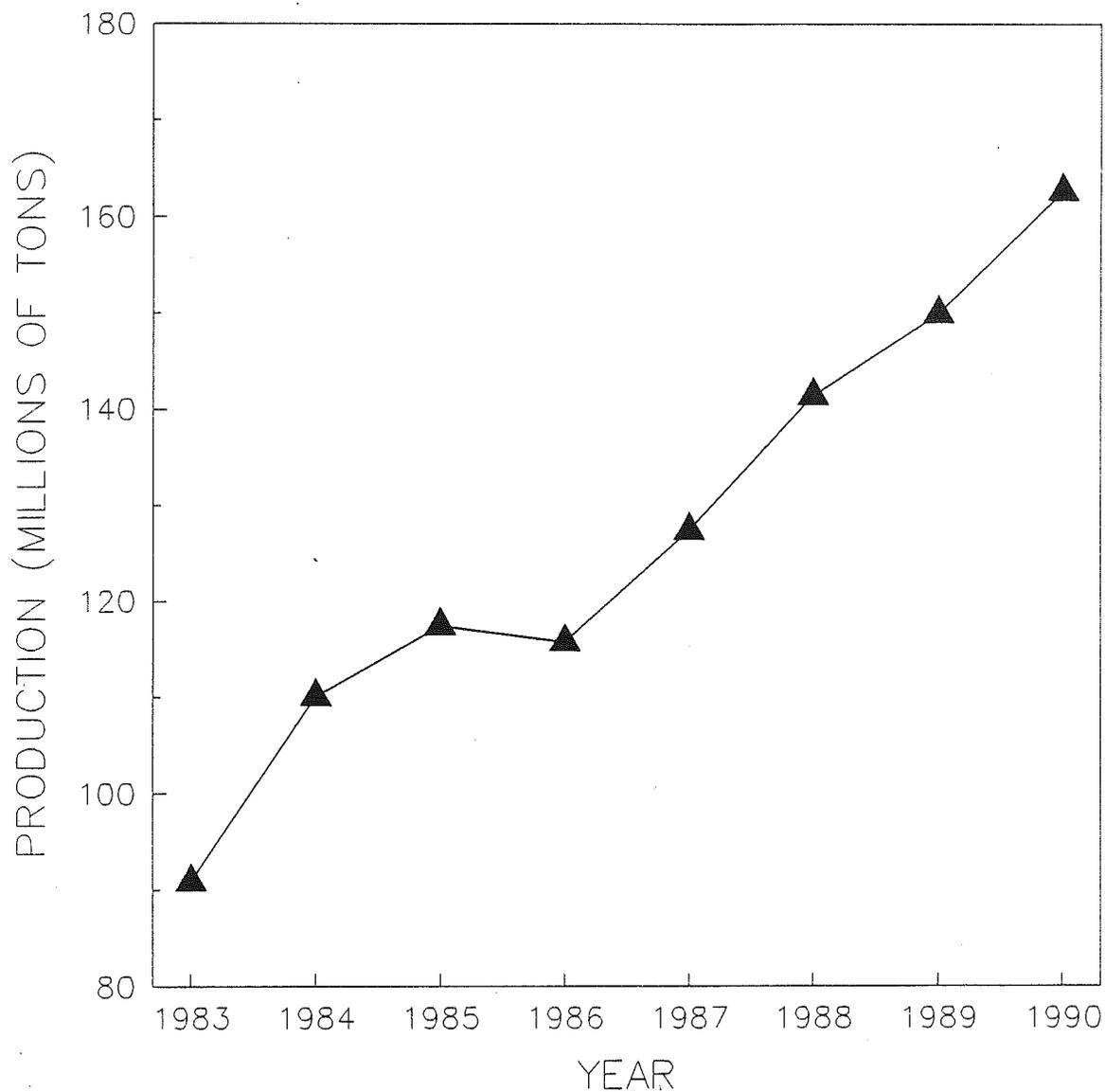
It should be noted that coal production increased steadily in the Powder River Basin from 1983 to 1990, without leasing (Figure 1), and was expected to continue increasing, even without new leasing or the Clean Air Act of 1990.

According to the Powder River Regional Coal Team Operational Guidelines, approved in their final form in August, 1991, "if the application is either for (1) a tract that would

ANNUAL PRODUCTION OF COAL

Campbell and Converse Counties

Wyoming



Source: Wyoming Geo-Notes No. 32, Table 6;
November 1991;
Published by the Geological Survey of Wyoming

FIGURE 1

increase permitted production levels or (2) increase production beyond existing production facilities or (3) is for a tract that would be mined by a new mining operation", the RCT will "determine if the RCT should recommend recertifying the Powder River Coal Production Region" (Paragraph VII. A.). On September 6, 1991, the RCT determined they would not recertify after reviewing all the existing lease applications, including the West Black Thunder application. The Thunder Basin Coal Company made a presentation at that meeting, at the request of the RCT. Therefore, any requirements for the new LBA process have been met.

2.) Shell Mining has expressed interest in a portion of the lands included in the West Black Thunder Tract. That interest was expressed in the form of obtaining an exploration license for an area which overlapped part of the West Black Thunder Tract. The exploration license allowed them to drill holes within the area covered by the exploration license for the purpose of gathering data on coal thickness and quality in that area. Shell Mining has the option of filing for a lease by application if they do have an interest in acquiring that acreage. To date, they have not done so. In the absence of an overlapping application, dividing the tract into two parts would make it less competitive, as two smaller tracts would be less attractive and less valuable for a bidder interested in acquiring a lease for a potential new start mine. The BLM concluded that, in the absence of an overlapping lease application, dividing the lease into two tracts would not enhance competitive bidding and would potentially reduce the value of the tract to a bidder interested in starting a new mine.

BLM prepares detailed evaluations to determine the value of the coal to assure that the government receives at least the fair market value of the coal, regardless of how many bidders there are. The lease will not be issued if there is not a bid which at least meets the Fair Market Value of the tract, regardless of how many bidders there are.

3.) The BLM has considered a somewhat different tract configuration, as the BLM added acreage to the West Black Thunder Tract in section 7, in order to prevent a potential bypass situation. The tract is bounded by the existing Black Thunder lease on the east. To the west, the coal is generally deeper, and becomes more difficult and less economic to mine, and therefore lower in value. Extending the lease to the north or south would add to the distance which the coal would have to be transported to mine facilities prior to shipping, which would increase both mining expense and impacts (traffic and/or facilities). Also, Highway 450 bounds the northern end of the lease application area, and extending the mine north of the highway would cause additional disruption, impact and expense.

4.) This has been expanded in the final EA. Blasting and dust control are regulated, and blasting and dust control plans which mitigate impacts to the public must be approved prior to mining. The effects of blasting and dust control are monitored on a daily basis at the Black Thunder Mine.

The ability to control blasting and dust related problems was demonstrated by Black Thunder in the early 1980's, when they did have operations on both sides of Highway 450. Potential blasting or dust related problems were effectively mitigated at that time, although mining took place near the highway, and haul roads were located under the highway.

ENVIRONMENTAL ISSUES

5.) NEPA does not require re-analysis of activities and impacts which have been analyzed and found to be acceptable in previous environmental documents. The BLM has determined that the leasing of coal as applied for in the LBAs to date will not result in levels of mining or in levels of impacts which exceed the levels which were analyzed in three previously prepared regional Environmental Impact Statements (EISs) which were finalized, and in a fourth EIS, where analyses of mining were prepared although the EIS was never finalized. Impacts which have occurred as a result of mining have not reached, let alone exceeded, impacts predicted and found to be acceptable in those previous EISs. The results of studies which have been published in the years since the preparation of the last EA have been incorporated into the EA. These additional studies do not indicate that there are additional unmitigatable impacts which were not considered in the previous EISs. More importantly, these studies show that monitoring and research into potential problems are continuing, that impacts are not exceeding those which were previously predicted, and that the process is working. As new information creates new questions, new studies and new monitoring are being done on a continuing basis to improve mining and reclamation processes.

The 1 billion tons of coal you cite is the estimated total recoverable coal for the pending LBAs in the Powder River Basin. As you are aware, these LBAs range from 57 MM tons for West Rocky Butte to 433 MM tons at West Black Thunder and may be offered individually over the next few years. In contrast, the 1981 EIS looked at the sale of 2.35 billion tons in two sales for seven new mines and eight maintenance tracts. At the current rate of coal production in the Powder River Basin, one billion tons is about six years of supply.

6.) As a result of PRBRC's comment, the DEQ was contacted by the BLM to explain any concerns they have with GAGMO data.

GAGMO is a voluntary organization which was formed to report the data which is gathered by the monitoring which is required by federal and state law. There is no requirement that the mines (or anyone else) compile and report this data.

According to the DEQ, while the reporting of the data can sometimes be inaccurate, the actual monitoring data which are reported by the companies to the DEQ, from which the GAGMO report is taken, are accurate. DEQ has a monitoring program for each mine which is developed as part of the mine permitting process. The data DEQ uses are from the wells identified in these plans. DEQ has quality assurance procedures which are in effect on this data.

DEQ uses the GAGMO report as a preliminary review of the monitoring effort. They don't use it for more than that because they have the actual data the report was compiled from in their files. In the West Black Thunder EA, BLM uses the GAGMO report as evidence that monitoring to date indicates that impacts on the aquifers being mined are within the impacts which were previously predicted and found to be acceptable. The BLM believes that the data in the GAGMO report is accurate for that purpose, based on discussions with the DEQ.

Regarding lower Fort Union wells, the decision made by GAGMO was not to include

Fort Union wells in the GAGMO report. This decision is primarily a financial one. The Fort Union Formation lies below the coal, and is not being removed or otherwise disturbed as a result of mining activity. The mines must obtain a permit from the State Engineer to use Fort Union water, just like any other water user in the state must obtain a permit to use groundwater from any aquifer. There are not water monitoring requirements for aquifers which are not being mined. However, the mines do report water levels from Fort Union wells to the State Engineer on a yearly basis.

7.) The Wyoming State Engineer's Office has primacy on groundwater management in the state of Wyoming, and the State Engineer does have groundwater monitoring wells around the state. The DEQ oversees the water monitoring program for coal mining. The BLM, USGS, and OSM do work with both these agencies on Wyoming water issues. There are a number of publications on past and ongoing studies on groundwater in the Powder River Basin which demonstrate that this is true. These publications include: "Investigations of Possible Effects of Surface Coal Mining on Hydrology and Landscape Stability in Part of the Powder River Structural Basin, Northeastern Wyoming", by Bloyd, et al., (USGS Water Resources Investigations Report 86-4329); the 1988 CHIA, by Martin et al. (USGS Water-Resources Investigations Report 88-4046), prepared in cooperation with the Wyoming DEQ, and the Office of Surface Mining; "Ground-Water-Flow Systems in the Powder River Structural Basin, Wyoming and Montana", published in 1990 (USGS Water-Resources Investigations Report 85-4229); and "Evaluation of Ground-Water Level Changes near Gillette, Northeastern Wyoming, by M.A. Crist, published in 1991 (U.S.G.S. Water-Resources Investigations Report 88-4196).

8.) The CHIA also states that, while surface coal mining will initially degrade ground-water quality in the area of mining, "In general, the chemical quality of current (1986) and future water from the spoil aquifers will meet the State standard for livestock" (p.92). It also says that column leach tests indicate that the elevated levels of dissolved solids and select constituents caused by coal mining will decrease with time (p.92).

More than 50 monitoring wells have been completed in backfill areas by the mining companies, and these wells are monitoring water levels and water quality in the backfill. The monitoring data from these wells has been and will be used to evaluate the long term effects of coal mining on water quality in the actual spoil piles to determine if the laboratory column leach tests correctly predicted the actual situation.

9.) There is a potential that there will be a migration of water from the spoils piles to unmined Wasatch aquifers and the Wyodak-Anderson coal aquifer, however, as stated in the CHIA, in general, the level of "contamination" of the water from the spoils piles is not expected to change the suitability of the water for use by livestock (p.92). That is the current major use of that water. Both the Wasatch aquifers and the Wyodak Anderson coal aquifer are generally high in dissolved solids in the premining state, as shown in Table 4 of the CHIA. The aquifers in the Wasatch, and the Wyodak-Anderson coal aquifer are the only aquifers which are being removed by mining and replaced by spoil piles, and therefore are the aquifers which will be affected by migration of water from the spoils piles.

10.) The time required for recovery of equilibrium water levels is of the same order of

magnitude as for the original mine area: tens to hundreds of years. The existing backfill monitoring wells already contain water, and this recharge has occurred in less than 10 years.

11.) The regional study referred to is the CHIA. As expressed in the CHIA, the time required for the water to return to a pre-mining condition will be longer than the time required to re-establish equilibrium, which is 10s to 100s of years. In general, however, there will be water available which is suitable for existing uses before the spoil aquifer returns to a premining condition. As a result, no mitigation will be required in most cases. If mitigation is required in specific cases, then supply wells can be completed in other aquifers. SMCRA, Section 717, requires that coal operators replace water supplies diminished by surface coal mines. SMCRA regulations apply to leased coal, and are administered by the OSM and, in Wyoming, by the DEQ.

12.) The cumulative effects are not expected to be significantly different from those shown in Figure 10 in the draft EA (Figure 11 in the final), which was taken from the GAGMO report. The effects shown in Figure 11 are based on computer modeling which includes cumulative impacts as a result of contiguous mines. If the tract is leased, the permit application package will include a more exact prediction of the expected water level declines resulting from mining the West Black Thunder Tract. This prediction will be based on groundwater modeling techniques, and will include cumulative effects to be expected as a result of the existence of the Jacobs Ranch Mine (north of the Black Thunder Mine), and the North Rochelle mine (south of the Black Thunder Mine). Mitigation for any wells affected by this drawdown is covered by SMCRA, and is explained above.

13.) The impacts to these wells could range from a lowering of water levels to destruction of the wells, depending on their location. Mitigation could range from lowering the pump to replacement of the well, depending on the degree of well impact. This mitigation comes under the jurisdiction of SMCRA and is therefore addressed by the OSM and the DEQ in the permitting stage of the process.

14.) The Wyoming Mining Association and the Wyoming DEQ are jointly studying the nature and effects of selenium in the mine backfill and in undisturbed ground. They are considering topics such as the presence and fate of selenium in undisturbed ground and in the backfill, the availability of selenium to plants, and the effects of selenium on target species. The goal is to determine appropriate criteria for handling selenium.

Naturally high levels of selenium do occur locally in the Powder River Basin. Mitigation measures for minimizing selenium contamination if high selenium levels are encountered are already in place and being used. They consist of stipulations which designate special handling of the affected spoil material. This is also discussed in the final EA. Specific stipulations for minimizing potential selenium contamination are applied during the permitting stage.

15.) The potential for selenium to contaminate surface water is minimized by the spoil handling practices for spoils which contain higher selenium levels. These spoils are placed in a way that surface runoff over the spoils does not occur, and groundwater solute transport off site is minimized. The BLM is not aware of any documented cases of selenium problems related

to plants or animals in the Powder River Basin as a result of coal mining and reclamation after more than 10 years of mining. If the PRBRC has data which demonstrates that plant or animal related selenium problems have occurred due to mining, the BLM will take them into consideration.

16.) Water level declines in the Fort Union in the Gillette were attributed to withdrawals at subdivisions and trailer parks by the CHIA, p. 30. The information in the CHIA was attributed to Marvin Crist. This conclusion also is stated in "Evaluation of Ground-Water Level Changes Near Gillette", Northeastern Wyoming, by Marvin Crist, U.S.G.S. Water-Resources Investigations Report 88-4196, published is 1991.

The BLM is aware of only one user of lower Fort Union water user in the vicinity of the Jacobs Ranch and Black Thunder Mines, and that is the city of Wright. According to the State Engineer, Wright has four wells which are deeper than 1000 feet, and they are the only licensed water wells deeper than 1000 feet in a 100 square mile area surrounding Wright. Wright's wells are more than 10 miles away from any of the mine wells. As a result of the distance between the Wright wells and the mine wells and the discontinuity of sands in the lower Fort Union, no impacts to Wright's wells are anticipated as a result of the mine's using lower Fort Union water.

As stated previously, the lower Fort Union aquifers are not being disturbed by mining. Also, recharge is still occurring to these aquifers from outcrops east of the mines which are also not being disturbed by mining. Calculations shown in the West Black Thunder final EA indicate that the amount of recharge to the Tullock aquifer east of the West Black Thunder mine is greater than the amount being used by the mine.

CONCLUSION

The BLM maintains that the actual impacts associated with 10+ years of mining are within impacts considered, analyzed, and found to be acceptable in four previous regional EISs. Furthermore, there are no documented incidences of impacts related to mining which have not been mitigated and which were not considered in the previous EISs or in the current EAs. Therefore, there is not a need to prepare a regional EIS at this time.

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3420(LBA)
WYU118907

Mr. James W. Monroe
BLM Casper District Office
1701 East E Street
Casper, WY 82601

6339 Clareton Hwy HCR-83
Gillatte, WY 82716
November 27, 1991

Dear Sir:

In regard to Thunder Basin Coal Company's lease application, I am writing this letter in support of their obtaining the West Black Thunder Tract.

I have lived on a ranch near the Black Thunder Coal lease for 35 years. I was here long before there was any mineral development and have been through the evolution of the oil, uranium, and coal business in Caspell County.

I am very favorably impressed by the measures taken by the personnel of the Thunder Basin Coal Company and Atlantic Richfield to take responsible action for the preservation of the environment and actually improve the area mined and reclaimed.

The Town of Wright has been almost entirely conceived, promoted, and subsidized by the Thunder Basin Coal Company for the comfort and well being of their employees and other residents of southern Caspell County. In every case, that I am aware of, the company has been the leader in promoting good housing, medical care, and transportation for the people affected by the mining of coal in southern Caspell County. I would like to see them have the opportunity to lease and develop the West Black Thunder Tract. They have proven themselves to be good neighbors, responsible business people, and environmentalists beyond the call of duty.

I wonder what kind of problems the county would have had by now if some other company had been allotted the permit to mine this area.

Sincerely,

Paul R. Stuart

Paul R. Stuart

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3420(LBA)
WYU118907

Charles E. Emery Jr.
3108 Clareton Hwy
Gillatte, Wyo 82716

Dec 15, 1991

Mr. James Monroe
BLM Casper District Office
1701 East E St.
Casper, Wyo 82601

Dear Mr. Monroe,
In regard to Federal coal lease application WYU118907 I am very much in favor of this lease. I have a small ranch east of this site and have not had any adverse effects from the mining of coal in this area. I have observed the reclamation works and find it impressive. The financial impact the additional leases would have on the area and the state as a whole far outweigh any objection environmentalists may bring up.

Respectfully submitted
Charles E. Emery Jr.

Response to Letters 28 and 29, from the President and Regulatory Affairs Manager of the Thunder Basin Coal Company

The BLM appreciates the concerns of the Thunder Basin Coal Company, as well as the they have provided during the preparation of the draft and final Environmental Assessments. These comments will be taken into account in the preparation of the Decision Record.

Discussion of Letters 30 through 92

The following comment letters were received in support of the West Black Thunder lease application from employees of the Thunder Basin Coal Co., contractors who work with the Thunder Basin Coal Company, people who do not work in the coal industry, but whose jobs are affected by the state of the coal industry, and other interested citizens of northeastern Wyoming. In general the following letters reference the importance of coal mining to the state and to the country, and the commitment of Thunder Basin Coal Company to the state and the local communities, as well as their commitment to the environment, as demonstrated by their past mining and reclamation record and the awards they have received in recognition of that record.

The BLM considers the importance of coal to the nation and to Wyoming an important factor in making the decision as to whether the coal should be leased or not. The BLM also believes that the operation of the mines in the Powder River Basin to date has demonstrated that the impacts of leasing and mining coal can be and are being mitigated, and that the system will continue to work under the lease by application process.

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November 15, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: Federal Coal Lease Application WYW118907

Dear Mr. Monroe:

This letter is written in response to the public comment notice on the West Black Thunder tract under application by Thunder Basin Coal Company.

So far in my career, I've had the opportunity to work in all phases (research & development, exploration, construction and production) of the mining industry. My career has now come full circle, as I'm a member of the Environmental Department at Thunder Basin Coal Company. The final (reclamation) phase of the mining process is by far the most fulfilling. Our reclamation goals are to preserve/return pre-mining wildlife habitat and domestic habitat to the same or better usefulness in post-mining. The goals have and are being achieved as evidenced by our receipt of several prestigious state and national awards.

I'm proud to be a part of Thunder Basin's Environmental Team. We don't perform reclamation just because it's required—we are an "environmentally-conscious" company concerned about the preservation of our past, present and future rangeland and natural resources. I'm equally proud to be a resident of Wyoming, a state which enjoys low property taxes and no state income tax. My children are fortunate to live and be educated in Campbell County.

In support of my future with Thunder Basin Coal Company and the lease-by-application process in general, I sincerely hope additional coal reserves can be obtained through our application.

Sincerely,

Sua Hillia
Sua Hillia
Environmental Assistant
Regulatory Affairs Department

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Soda
Butte
Services, Inc.

November 18, 1991

Mr. James W. Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: West Black Thunder Draft Environmental Assessment

Dear Mr. Monroe:

As a resident of northeastern Wyoming, I am writing in support of the West Black Thunder maintenance tract lease applied for by Thunder Basin Coal Company. I am a native of Wyoming and have worked directly for or been affiliated with coal mining activities in this region and throughout the United States for the past eleven years.

Most recently, our company, like many other service companies in the region, has had the opportunity to provide contract services to Thunder Basin Coal Company. As such, I have seen first hand their commitment to the environment, the surrounding communities and the conscientiousness of their people.

It is my view that acceptance of the West Black Thunder maintenance tract lease would provide a number of benefits. The primary of which would be to extend the life of a proven successful mining operation for an additional 13 years. This would not only provide stability of jobs for the region's largest mine and one of the largest employers, but would continue the contribution of millions of dollars of revenue to the State of Wyoming and the Federal government in royalties and taxes into the future.

The West Black Thunder maintenance tract lease would serve as a logical extension of the existing Black Thunder mine. By doing so, the impacts to the surrounding area would be minimized by continuing operations of a proven mining operation and utilization of existing facilities.

Engineering, Consulting & Exploration
P.O. Box 319, Laramie, Wyoming 82070
307/644-2434

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November 19, 1991

Mr. James Monroe
U.S. Department of Interior
Bureau of Land Management
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe:

I am writing this letter in support of the coal lease sale to Thunder Basin Coal Company. I am an employee of the company and I work in the Regulatory Affairs Department preparing many of the permit applications needed by the company. I have first hand knowledge of the effort and concern Thunder Basin places on environmental matters. There are three major points I would like to make outside of the fact that I would like my job to continue long into the future.

My first point is concerning energy independence of the United States. Black Thunder and all the mines in the basin provide a very substantial base for electrical generating capacity in the United States. This means less electrical energy needs to be imported from outside of the United States in the form of oil or natural gas or electricity. The fact that it has a low sulfur content is an additional benefit in helping to reduce the generation of "acid rain". If the sales of the additional coal is not allowed to take place, we as a nation will have to either cut back on our lifestyle or import additional energy and place ourselves at risk. This would not be of benefit to anyone.

My second point is concerning the "power" exercised by environmental groups. Prior to coming into the Powder River Basin, I was working in the uranium industry in New Mexico. The domestic uranium industry is almost nonexistent because of the emotional tactics used by environmental groups on an uninformed population. I do not want to see the coal industry face the same fate. Environmental groups have the right to their opinions but the tactics of creating fear and sensationalism to scare the citizenry is not appropriate.

When we were permitting the Black Thunder Mine in 1990 and 1991 with the Land Quality Division of the Wyoming Department of Environmental Quality, the Powder River Basin Resource Council (PRBRC) filed an objection to the issuance of our permit at the very last moment. This did not allow us time to resolve the issue in the public comment period. The issuance of the permit was delayed for approximately three weeks because of the objection. What the PRBRC did was totally within the framework of the regulations but it was

Mr. James W. Monroe
November 18, 1991
Page 2

In conclusion, I once again wish to express my support of the West Black Thunder maintenance tract lease and the lease-by-application process in general. This process should benefit us all in continuing the successful and environmentally sound mining operations while contributing economic support to this region and the State of Wyoming.

Sincerely,
Steve L. Hampton
Steve L. Hampton
Vice President

Mr. James Monroe
November 19, 1991
Page 2

also calculated to cause the greatest disruption possible. All I am asking for is professional objectivity in your review of all comments and possible objections.

Finally, Thunder Basin Coal Company is the generator of a great deal of tax revenues for the federal and state governments. If the rate of coal production is reduced, as it would be if additional reserves are not acquired, the taxes generated would also be reduced. With the revenue deficits now being faced by both the federal and state governments, now is not the time to be restricting the generation of the tax revenues.

Thunder Basin Coal Company is concerned about the environment and wants to be a good corporate citizen. We do work very hard to meet and go beyond the regulations in protecting the environment. I am proud to be working for such a company. Please allow us to continue mining coal in Campbell County far into the future.

Sincerely,

Dean L. Roberts
Dean L. Roberts

Dean L. Roberts
P.O. Box 983
Wright, WY 82732

Mr. James Monroe
November 18, 1991
Page 2

4. The EA states the WBT coal will extend the life of the Black Thunder Mine by up to 13 years. Given the current state of Wyoming's finances, it is critical we provide support to an industry which is one of the few steady revenue producers left.

In closing, I believe the EA adequately addresses the environmental impacts that may result from leasing and mining the WBT maintenance tract. Again, I wish to sound my support for the leasing process and for the WBT lease in particular.

Sincerely,

Patrick T. Tyrrell
Patrick T. Tyrrell, P.E.
Gillette, Wyoming

Tyrrell
Ethel Anderson
Gillette, WY 82710

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November 18, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: West Black Thunder Draft Environmental Assessment

Dear Mr. Monroe:

I am writing in support of the lease-by-application process and in particular the West Black Thunder (WBT) maintenance tract lease applied for by Thunder Basin Coal Company (TBCC). I am a professional hydrologist and an employee of TBCC and as such have a strong interest in the lease. Please accept the following comments on the Draft Environmental Assessment (EA) for WBT:

1. I believe the EA is the proper assessment mechanism for WBT. There have been at least 16 other EIS's or EA's prepared relating to Black Thunder Mine or the Powder River Basin coal resource (not counting documents specific to other mines). Neither coal production rates nor environmental impacts have been as great as originally thought. Thus, the expense of preparing an EIS for the region, as some suggest, would be an indefensible waste of taxpayer money at a time when it can be ill afforded.
2. The EA states that approximately 56 million gallons of water from the sub-coal Ft. Union formation (Tulloch member) is used at Black Thunder Mine. Several groups have said that simply because the mine(s) use water from the Ft. Union, for recognized domestic and industrial uses, a huge study should be performed to assess the effects of that pumpage on the aquifer. To be sure, 56 million gallons is about the irrigation requirement of 90 acres of alfalfa over a growing season. If that's all it takes to trigger a major research project, then we should also exhaustively study every aquifer beneath every farm or ranch in this state that uses wells for irrigation. Is this a compelling reason to spend our tax money?
3. TBCC's track record for reclamation (recipient of at least eight reclamation-related awards since 1987) indicates the Company's commitment to leaving the land suitable for equal or higher use. TBCC has committed physical resources and thousands of dollars to the studies of selenium in the environment; pioneered Golden Eagle relocation techniques; performed grazing demonstrations to show the production capability of reclaimed land; and refined methods for increasing vegetation species diversity and shrub density on reclaimed land. From the foregoing, it is obvious TBCC is not planning to mine the land and walk away. The environmental conscience of the Company is strong, but sadly because we are "industry", it is also easy to ignore.

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WY 118907

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Mrs. JoAnn Mourich
P.O. Box 457
Wright, WY 82732
November 17, 1991

Mr. James W. Monroe
Casper District Office
Bureau of Land Management
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe

WEST BLACK THUNDER ENVIRONMENTAL ASSESSMENT

The present state and federal environmental controls are functioning commendably in controlling land, water, and air quality in the state of Wyoming. Our environment is a valuable asset to our state, and our land and resources must be preserved for future generations. The Bureau of Land Management's careful assessment is necessary to keep in alignment with our environment.

The Thunder Basin Coal Company recently requested an additional Federal coal lease west of the existing Black Thunder Mine, which will extend the life of this mine an additional 13 years. The granting of this lease will allow Campbell County and the state of Wyoming to continue to benefit from its mineral wealth in the future as well as now. The present mine plan indicates a decrease in production after 1996 with a closure in 2017, which results in declining employment affecting not only employees at the mine, but also the support jobs created for each full-time position at Thunder Basin Coal Company. This company's annual payroll of \$22.5 million greatly impacts the towns of Wright and Gillette.

As we all know, Campbell County's mineral royalties are invaluable to the federal government and the state of Wyoming. This new coal lease will generate \$250 million in royalties with Wyoming receiving approximately 50 percent.

The employees of Thunder Basin Coal Company take pride in their mining and reclamation of the land. Their many environmental awards demonstrate the value that is placed on preserving the wildlife and land of our great state. I strongly agree with a positive recommendation of the environmental assessment of this lease, which adequately covers the proposed action. As an interested party, I will carefully track the progress of this process. I expect you, Mr. Monroe, to voice my opinion in this matter.

Sincerely,

JoAnn Mourich
JoAnn Mourich

Mrs. JoAnn Mourich
P.O. Box 457
Wright, WY 82732

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November 20, 1991

Mr. James Monroe
BLM Casper District Office
1701 East 'E' Street
Casper, WY 82601

Dear Mr. Monroe:

I would like to take this opportunity to voice my support of Thunder Basin Coal Company's (TBCC) proposed West Black Thunder Lease by Application (LBA). The benefits to Campbell County and the State of Wyoming by your issuance of this LBA far outweigh the minor impacts associated with the Black Thunder mining operation. TBCC contributes greatly to the local and state economies in the form of salaries, taxes, and Federal royalties (half of which are returned to the State of Wyoming).

The number of jobs at the mine, those in support of the mining operation (contractors and vendors) as well as those in the community that would be directly affected by denial of the proposed LBA. The West Black Thunder LBA would extend the life of the Black Thunder Mine by up to 13 years. If the LBA was not issued, these jobs and the associated money entering into the local and state coffers could stop at the end of the current lease as mining ceases and workers of all types leave the area to find jobs.

TBCC has an excellent history of reclamation efforts as evidenced by their being awarded the Wyoming Excellence in Surface Mining and Reclamation First Place Award in 1987, 1988, and 1989 and Honorable Mention in 1987 and 1990. Mining impacts to the areas ground water environment have also been found to be much less than predicted by premining models.

With the above in mind, I would strongly support the issuance of the West Black Thunder LBA as an extension of the Black Thunder Mine.

Sincerely,

Martin W. Stearns

Martin W. Stearns
6602 Katrina Avenue
Gillette, WY 82716

CLT@ANADOLUWPT.COM

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PA	BRA
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OPR	PRA
LRR	Lead Resp
RGR	Lead Resp

November 26, 1991

Mr. James Monroe
BLM Casper District Office
1701 East 'E' Street
Casper, WY 82601

RE: West Black Thunder Maintenance Tract Lease Application

Dear Mr. Monroe:

This letter is in response to the public comment notice on Thunder Basin Coal Company's (TBCC) West Black Thunder maintenance tract lease application. As a proud employee of TBCC I would like to communicate some observations regarding TBCC's commitment to the environment and its employees.

I joined TBCC's Environmental Team in June of 1990. Since that time I have observed the total dedication of TBCC in guaranteeing that the post-mining environmental quality is equal to or above that of pre-mining. I continue to be overwhelmed by the caliber of reclamation which has become the standard of excellence in the environmentally responsible corporate citizen. This policy is illustrated daily from corporate management to field personnel.

In addition to its strides in the environmental field, TBCC also provides superior jobs for the citizens of Wyoming and continues to be a major contributor to the States economy.

Considering the above factors, I genuinely hope that the West Black Thunder tract lease application will be approved.

Sincerely,

Bonita K. Short

Bonita K. Short
Environmental Engineer
Gillette, Wyoming

CASPER BLM	
NOV 29 '91	
ADM	FL
PA	BRA
AO	NRA
OPR	PRA
LRR	Lead Resp
RGR	Lead Resp

1114 E. 9TH Street
Gillette Wyo. 82716
November 22, 1991

James W. Monroe
BLM Casper District Office
1701 East 'E' Street
Casper, Wyo. 82601

Dear Mr. Monroe:

This letter is in regard to the federal coal lease application for West Black Thunder by Thunder Basin Coal Co. I am an employee of Black Thunder concerned about the future of my job; also, I would like to point out facts which should be considered as good stewardship of public lands. My respect and knowledge of land management stems from being raised on a ranch where values of production and preservation work together. The office of the Bureau of Land Management is entrusted to administer these lands in the best interest of the American public for present as well as future generations.

During the past twelve years of working in pit operations, Black Thunder Mine has grown from production levels of ten million to thirty million tons of coal per year. The nature of my job provides a chance to observe first-hand the effects of mining on the environment and wildlife. These qualities are two areas most visually noticeable and must be maintained or improved to preserve the integrity of the land. Quality of this semi-arid land appear vastly improved when reclamation efforts have concluded. The land is more productive in terms of natural habitat in regard to the amount and quality of grasses, shrubs and other native species which now grow. Successful reclamation of the land also leads to improved habitat for wildlife in this area. The numbers of deer, antelope, elk, eagles, hawks, fox, and many other animals to numerous to mention continue to flourish and grow.

As administrator of lands for the American public, your position must be to provide the greatest return today without jeopardizing the integrity of the land for future generations. The

presence of coal on this isolated and otherwise obscure tract of land provides you with the challenge of not only providing a sizable income by leasing the land for the coal reserves, but also, improving the quality of this land for future generations. Coal which fuels generators that provide this nation with electricity is at the mature stage of usefulness. This natural resource will propel America and the world into the next century; however, future generations at some point in time will find an alternate source of power to provide electricity. Strict laws enacted by the State of Wyoming in conjunction with federal laws will assure present and future generations of quality public land. I encourage the approval of this application which is in the best interest of all citizens. Please find attached a list of awards supporting environmental responsibility.

Sincerely,

Ralph Olsen
Ralph Olsen

3420(LBA)
WY118907

CASPER BLM	
DEC 01 '91	
COM	MN
ADM	FL
PA	SL
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

November 29, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: West Black Thunder Draft Environmental Assessment

Dear Mr. Monroe:

I'm writing to you in support of the West Black Thunder (WBT) maintenance tract lease that Thunder Basin Coal Company (TBCC) has applied for. I've been employed by TBCC as a revegetation specialist for over eight (8) years and take great pride in the exemplary reclamation achieved at the Black Thunder Mine (BTM).

As an employee I take great interest in the fact that the WBT coal lease could extend the life of the BTM up to thirteen (13) years while providing a tremendous amount of revenue to the state of Wyoming and the federal government.

In summary, I believe the WBT environmental assessment more than adequately addresses the environmental impacts that could result from leasing and mining the WBT maintenance tract.

Sincerely,

Robert L. Moore
Robert L. Moore
Gillette, Wyoming

CASPER/BLM/PT/24

11-27-91
3420(LBA)
WY118907

Dear Mr. Monroe,

I am writing to you in support of the proposed sale of the West Black Thunder Coal Lease. Thunder Basin Coal Company (TBCC) is a leader in the Powder River Basin not only in production but in environmental concerns. As you are probably aware, TBCC has over the years been awarded many environmental awards. Because of these efforts, we at the mine enjoy the presence of Eagles, Antelope, Deer, Elk and many other birds and animals. Only through commitment and hard work are we able to achieve such success.

I am proud to work for TBCC and am proud of our accomplishments over the years. TBCC is a responsible corporate citizen and is committed to doing things right. Again, this only happens with commitment and hard work.

This lease could make a difference in the future of many of the nearly 500 people employed at the mine now. I want to see TBCC grow, and along with it, the state and local community. For this to happen, West Black Thunder must become a reality. I urge you to support this sale, not because of my views, but because of TBCC's track record over the years.

Sincerely,

Jim Van Emmerik
Jim Van Emmerik

CASPER BLM	
DEC 02 '91	
COM	MN
ADM	FL
PA	SL
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

3420(LBA)
WY118907

CASPER BLM	
DEC 02 '91	
COM	MN
ADM	FL
PA	SL
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OPR	NRA
LRR	PRA
RGR	Lead Resp

November 27, 1991

Mr. James M. Monroe:

As a concerned employee of Thunder Basin Coal Company, I am compelled to voice my opinion regarding the West Black Thunder Environmental Assessment. I am very much in favor of the release of this tract; not only because it will have an impact as to my immediate employment at Black Thunder Mine, but also impact many other employees and secondary jobs within Campbell County.

I am very proud to mention, and it is also on record, the very fine track record of Thunder Basin Coal Company in co-existing of operations to the environment.

Your favorable consideration will be much appreciated.

Sincerely,

Dave Shrum

DS/bl

WY118907
3420(LBA)

CASPER BLM	
DEC 02 '91	
COM	MN
ADM	FL
PA	SL
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

Fred Schmitz # POB 223 # Wright, Wyoming 82722
November 28, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

Re: Federal Coal Lease Application WY118907

Mr. Monroe, I resolutely urge the approval of the Federal Coal Lease Application WY118907. This Approval just makes good common social, economic and environmental sense.

Since you are aware of the positive social and economic contributions the Thunder Basin Coal Company makes to the citizens of Wyoming and the Nation, I would like to give you some first-hand insight to the environmental issue.

The men and women who operate the mining and processing equipment at the Black Thunder and Coal Creek mines know and practice the connection between their daily work activities and environmental preservation. They conduct their work to eliminate or minimize dust generation, preserve water quality and usage, and produce the best reclaimed land possible. This is accomplished while producing substantial quantities of excellent quality coal, safely.

It appears as though the Powder River Basin has sustained more environmental scrutiny than any mining district on the globe. More environmental assessments at this time, which would stall BLM approval of WY118907, are unnecessary. Further, your lease-by-application process is appropriate for the extractive industries. It ultimately contains price to consumers of the nation.

Mr. Monroe, I urge this approval as a citizen of the city of Wright, Campbell County and Wyoming, and as a concerned employee of the Thunder Basin Coal Company. Please consider me a resource if you require popular support.

Enjoy a good day and continued success.

Sincerely,

Fred Schmitz
Fred Schmitz

3420(LBA)
WY0118907

CASPER BLM	
DEC 02 91	
DM	MN
ADM	FL
PA	ES
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

Mr James W. Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe:

I would like you to know that I strongly support the lease of West Black Thunder to the Thunder Basin Coal Company.

Thunder Basin Coal Company has proven that mining operation can successfully coexist with the environment.

Sincerely,

Cheryl M. Monroe

3420(LBA)
WY0118907

CASPER BLM	
DEC 03 91	
DM	MN
ADM	FL
PA	ES
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

6802 Sleepy Hollow Blvd.
Gillette, WY 82716

November 29, 1991

Mr. James W. Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

RE: Lease Application

Dear Mr. Monroe:

I am writing this letter to you and your staff at the Bureau of Land Management asking for your support on the upcoming lease application for Thunder Basin Coal Company. This request by Thunder Basin Coal for the West Black Thunder lease will have a major impact on the future for the Black Thunder Mine.

I have worked for Thunder Basin Coal Co. for approximately six years along with eight years at two other Powder Basin coal companies. I have, through the years since I came here in 1977, seen substantial growth in Campbell County. This growth was abled by the B.L.M. granting federal land for the use of extracting coal. Many families, including my own, have established roots in Campbell County. These roots were initially set because of the appealing wages and salaries. But as my family and I have grown with the expansion in Campbell County, we now call this home. Without the additional leases, not only for Thunder Basin but for all the operators, someday we or our children may not enjoy the employment opportunities that we presently have.

I ask you to grant Thunder Basin Coal Company the West Black Thunder lease, for the future of the Black Thunder Mine and Campbell County.

Sincerely,

Robert A. McCreary

Robert A. McCreary

RAM/td

3420(LBA)
WY0118907

CASPER BLM	
DEC 03 91	
DM	MN
ADM	FL
PA	ES
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

December 1, 1991

Mr. James Monroe
U.S. Department of Interior
Bureau of Land Management
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe:

I am an employee of Thunder Basin Coal Company, and I am writing to support the West Black Thunder coal lease sale to our company.

I feel Thunder Basin, as well as all of the other coal companies in the Powder River Basin, do an excellent job of protecting the environment. The mining industry in our area can be very proud of the way we do reclamation, protect topsoil, protect ground water, etc. Compared to other mining areas and to other industries, we are very conscientious about protecting all aspects of the environment.

This coal sale will help the U.S. continue to provide most of its electricity from energy within our own country and not be dependent upon foreign sources of energy for the generation of our electrical needs. This sale will also provide additional revenue for the BLM, the State of Wyoming and Campbell County as well as providing more jobs.

I am particularly interested in the jobs that it will provide through the 1990's and beyond.

Please allow Thunder Basin to purchase the West Black Thunder coal tract allowing us to mine coal providing jobs and tax revenue well into the future.

Sincerely,

Marvin Sarro

Marvin Sarro

3420(LBA)
WY0118907

CASPER BLM	
DEC 03 91	
DM	MN
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LRR	PRA
RGR	Lead Resp

2DEC91

James W. Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

Dear Sir:

I would like to state that my wife and family strongly support the leasing process for West Black Thunder.

I am an employee of Thunder Basin Coal Company and other than ensuring my job and the jobs of other employees, this lease will generate a great deal of future income for the State of Wyoming and the community.

Sincerely,

Douglas B. McClintock
Debra A. McClintock

8161 Chukar Drive
Gillette, WY
82716

James W. Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY
82601

CASPER BLM	
020391	
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<input type="checkbox"/> AO	<input type="checkbox"/> BSA
<input type="checkbox"/> OPR	<input type="checkbox"/> NFA
<input type="checkbox"/> LRR	<input type="checkbox"/> PRA
<input type="checkbox"/> RGR	<input type="checkbox"/> Lead Ramp

Dear Mr. Monroe,

I am writing in support of the West Black Thunder Environmental Assessment. I write as a citizen of Campbell County and as an employee and Manager of Engineering of Thunder Basin Coal Company.

I have been involved in the discussions and planning for the maintenance lease concept that evolved over two years ago. Today, we stand approximately five years from a production decline at the Black Thunder Mine if the current reserve base is not increased. The maintenance lease concept fundamentally allows coal mines to plan reserve additions in concert with their customer's, the utility's, planning horizons. This planning process provides continuity to the communities, the work forces, and the businesses of the region. This process is prudent for all concerned.

I am proud to be an employee of Thunder Basin Coal Company because the CEO of our parent company, ARCO, has stated that we must work from the same side of the table as the regulators, environmental groups, neighbors, and all others who may have conflict with the interests of Thunder Basin Coal Company. This Environmental Assessment has tried to answer all the known issues from these groups. Thunder Basin Coal Company will continue to work from the same side of the table with these groups.

The lease sale for West Black Thunder should proceed on schedule. It is an action that is in the best interest of the people of Campbell County and Wyoming.

Sincerely,
Kenneth R. Miller
Kenneth R. Miller

November 29, 1991

Mr. James W. Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

CASPER BLM	
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<input type="checkbox"/> RGR	<input type="checkbox"/> Lead Ramp

Dear Mr. Monroe:

I am sending this letter to express my support for the lease of the West Black Thunder coal tract to Thunder Basin Coal Company.

The State of Wyoming and all Wyoming people will benefit from the lease. By extending the life of the Black Thunder Mine many jobs will be maintained and new jobs will be created.

Thunder Basin Coal Co. has an annual payroll of approximately \$22.5 million and for every full time position at the mine, at least one secondary job is created.

In these times of financial shortcomings the State of Wyoming is experiencing, it makes good sense to allow the lease to be granted as the state will receive one half of the royalties generated. This amount will be on order of \$125 million.

I believe some of the groups opposing the sale of this lease have interests other than environmental protection. Thunder Basin Coal Co. has received numerous state and national awards for its reclamation efforts. It is obvious, when viewing the reclaimed lands, that the land is much better than its original condition, therefore one has to believe the opposing groups have motives that will harm the State of Wyoming and its people.

There are many other ways that Thunder Basin Coal Co. has demonstrated that it is a respected corporate citizen. The company has shown strong community support by donating money and materials to schools and charitable organizations in Campbell, Crook and Weston counties. Thunder Basin Coal Co. has maintained an excellent working relationship with the ranching community through effective and regular communication. It has also worked with and supported various community emergency agencies such as ambulance services and fire departments.

It is my hope that you will grant the lease sale to Thunder Basin Coal Co. Thank you for considering my opinion.

Sincerely,
Albert A. Blakeman
Albert A. Blakeman
AAB/td

Mr. James W. Monroe
BLM Casper District Office
1701 East E Street
Casper, Wyoming 82601

CASPER BLM	
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Mr. James Monroe:

I am writing this letter to show my support for the West Black Thunder Lease that Black Thunder is trying to obtain.

West Black Thunder will extend the life of the mine by up to 13 years which will continue to employ people, create secondary jobs and pump millions of royalty dollars into Wyoming economy.

Thunder Basin's strong environmental track record, coupled with employee pride, has me convinced that Black Thunder will continue not only as a top producer but also continue to obtain awards for their environmental excellence.

Black Thunder is a role model in today's mining industry and it shows in all areas that they encounter. Again, for the reasons stated above, I support the West Black Thunder Lease.

Sincerely,
Wade Silvertson
Wade Silvertson

December 3, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY. 82601

re: Federal Coal Application WY0118907
West Black Thunder

Dear Mr. Monroe:

This is to express my support of the BLM's Coal Lease-by-Application process. Especially in view of Thunder Basin Coal Company's interest in West Black Thunder.

It is with pride that I, as an employee, of TBCC see the contributions that we make to the people of Campbell County, both on a personal and a monetary level. Tax dollars are very important to the city, county, state and federal governments.

We are proud of the effort and concerns of our fellow workers in the environmental goals set by our company. It is evident when looking at the accomplishments in this area that the environment is of great concern to all of us at TBCC.

This lease would extend the life of the mine considerably. Thereby enabling many people to attain a satisfactory life-style without detriment to the land on which we depend.

I urge you to confirm approval of the referenced application.

Sincerely Yours,
William S. Babcock
William S. Babcock
Mine Operation Supervisor

CASPER BLM	
020491	
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<input checked="" type="checkbox"/> ADM	<input type="checkbox"/> FL
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<input type="checkbox"/> RGR	<input type="checkbox"/> Lead Ramp

December 3, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY. 82601

re: Federal Coal Application WYU118907
West Black Thunder

Dear Mr. Monroe:

This is to express my support of the BLM's Coal Lease-by Application process. Especially in view of Thunder Basin Coal Company's interest in West Black Thunder.

It is with pride that I, as an employee, of TBCC see the contributions that we make to the people of Campbell County, both on a personal and a monetary level. Tax dollars are very important to the city, county, state and federal governments.

We are proud of the effort and concerns of our fellow workers in the environmental goals set by our company. It is evident when looking at the accomplishments in this area that the environment is of great concern to all of us at TBCC.

This lease would extend the life of the mine considerably. Thereby enabling many people to attain a satisfactory life-style without detriment to the land on which we depend.

I urge you to confirm approval of the referenced application.

Sincerely Yours,
Roger O. Johnson
Roger O. Johnson
Mine Operation Supervisor

CASPER BLM	
DEC 04 91	
OM	MN
ADM	FL
PA	SL
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Ramp

December 3, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY. 82601

re: Federal Coal Application WYU118907
West Black Thunder

Dear Mr. Monroe:

This is to express my support of the BLM's Coal Lease-by Application process. Especially in view of Thunder Basin Coal Company's interest in West Black Thunder.

It is with pride that I, as an employee, of TBCC see the contributions that we make to the people of Campbell County, both on a personal and a monetary level. Tax dollars are very important to the city, county, state and federal governments.

We are proud of the effort and concerns of our fellow workers in the environmental goals set by our company. It is evident when looking at the accomplishments in this area that the environment is of great concern to all of us at TBCC.

This lease would extend the life of the mine considerably. Thereby enabling many people to attain a satisfactory life-style without detriment to the land on which we depend.

I urge you to confirm approval of the referenced application.

Sincerely Yours,
Linda D. Ditch
Linda D. Ditch
Clerk

CASPER BLM	
DEC 04 91	
OM	MN
ADM	FL
PA	SL
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OPR	NRA
LRR	PRA
RGR	Lead Ramp

Attn: James M. Monroe
BLM Casper District Office

As an employee of Deep Coal at Black Thunder Mine I would like to take this opportunity to write my support of the West Black Thunder Environmental Assessment. I believe you are aware of Black Thunder's environmental achievements and awards for those achievements. Our wildlife habitat development and revegetation programs certainly enhance the wildlife in the area. It is a joy to see the abundant numbers of animals on the mine site.

It should be very clear that there is a deep commitment to preserve the environment by Black Thunder and our employees. Please recognize this letter as being my support of the West Black Thunder Environmental Assessment Issue.

Sincerely Yours,
Terry Etkon

Terry Etkon
Maintenance Supervisor
Thunder Basin Coal Company
Post Office Box 408
Wright, Wyoming 82593
Telephone 307 739 1300



Dec. 1 1991

Dear Mr. Monroe:

I am in favor of Black Thunder coal expanding. The project is essential to Hilette and the surrounding area. Campbell County is a coal industry and with out coal there would be no Campbell County. I am not employed by the coal companies but my job would be affected.

Sincerely,
Barbara Hallermann
Barbara Hallermann

1720 W. Warlow
Apt. 107
Hilette, WY 82716
307-687-1132

307	739	6370
307	739	6370
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3420(LBA)
444118007

CASPER BLM	
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RGR	Lead Resp

To James W. Monroe,

I am in favor of West Black Thunder Expansion. It will certainly help me & my friends keep their jobs. Also I feel that they should be required to put in some fish ponds in the Areas where Coal is removed.

Thank you
 Rodney Ewe Land
 608 W. Dennis Dr.
 C-Wetite, WY. 82716

P.S. I don't work for any coal mine.

Merrill Schofield
 Thunder Basin Coal Company
 1701 East E Street
 Casper, WY 82601



James W. Monroe
 BLM Casper District Office

As an employee of ARCO Coal for the past 10 years at their Black Thunder Mine, I would like to take time to write in support of the West Black Thunder Environmental Assessment Issue. I believe that you are fully aware of the environmental achievements and awards that we have received for our accomplishments in Wildlife Habitat Development and our innovative revegetation programs over the past several years.

I was fortunate enough to be operation supervisor in charge of "Construction and Reclamation of Reservoir 26-52-1" as well as "Construction of Rockpied Habitat for small mammals and reptiles" along the North Platte reclamation project.

I take much personal pride in Black Thunder Mine for receiving First Place and Honorable Mention awards for these two projects.

ARCO Coal has made it very clear that their commitment and dedication to the protection of an environment is very high on their priority list and will continue to be so for many years to come.

I am also a 14 year resident of Wright and have been involved in various community programs. The support our community receives from Thunder Basin Coal Company has always been excellent!

Please recognize this as a letter of support of the West Black Thunder Environmental Assessment Issue.

Sincerely Yours
 Merrill Schofield

3420(LBA)
444118407

CASPER BLM	
DEC 04 '91	
DM	MN
ADM	FL
PA	SL
AO	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

December 3, 1991

Steven R. Lewis
 1413 E. 12th #2
 Gillette, WY 82716

Mr. James Monroe
 BLM Casper District Office
 1701 East E St.
 Casper, WY 82601

Dear Mr. Monroe,

I am writing this letter with regard to the West Black Thunder environmental assessment.

As a concerned Wyoming citizen and Thunder Basin Coal Company employee, I see the West Black Thunder lease to be of great importance not only to the future of my employer, but also Wyoming's economic future.

The present Black Thunder Mine coal production forecast shows a decline in production in this decade, and a mine closure in or near the year 2017. Estimates indicate that the West Black Thunder lease would extend the life of the Black Thunder Mine by approximately 13 years.

There are several reasons why an extended mine life for the Black Thunder Mine is in the best interest of Wyoming.

Currently, our mine employs over 500 people of northeast Wyoming, and at least one secondary support job is created for each full-time position at Black Thunder. As you can see, the longevity of the Black Thunder Mine is imperative to the employment future for a large number of Wyoming citizens.

Aside from being a solid Wyoming employer, the Black Thunder Mine is a strong Wyoming corporate citizen. I am proud to work for a company that is conscious of the importance of our environment, and so widely recognized for environmental reclamation. It is truly a good feeling to work with a company that can draw natural resources from our earth without destroying it.

Also, the Black Thunder Mine provides a great deal of economic strength for our state in the forms of income, state royalties, and general commerce.

For these reasons, sir, I urge you to look favorably upon the West Black Thunder lease.

Sincerely,
 Steven R. Lewis

3420(LBA)
444118007

CASPER BLM	
DEC 04 '91	
DM	MN
ADM	FL
PA	SL
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LRR	PRA
RGR	Lead Resp

James W. Monroe
 BLM Casper District Office
 1701 East E Street
 Casper, WY 82601

Dear Mr. Monroe

As an employee of Thunder Basin Coal Company I have first hand knowledge of the mining process. I am well aware of how deeply committed to protecting the environment and supporting the community that Thunder Basin Coal Company is during its daily mining activities. These statements may seem bold and prejudiced by the fact I am employed by Thunder Basin Coal Company. Until you consider the track record of community involvement, numerous environmental awards received by the company and the tax base support provided by the mining activities. With this in mind I request your support for approval of the west black thunder coal lease.

Sincerely,
 Douglas A. Zealand
 322 Willow Creek Dr.
 Wright, WY 82732

2420(LB4)
WY1118907

Dear Sir: I would like to voice my support for the WEST BLACK Thunder Lease proposal. I'm a native of Wyoming and have worked in the Powder River Basin coal industry for over twelve years. I feel the coal industry has benefited the people of Wyoming without adversely affecting the environment.

CASPER BLM	
DEC 05 91	
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LRR	PRA
RGR	Lead Resp

Thank You
Matt Mella
516 Granite Ct.
Gillette, Wyo 82401
(307) 682-6437

2420(LB4)
WY1118907

December 3, 1991

James W. Monroe
BLN Casper District Office
1701 East 'E' Street
Casper, WY 82601

CASPER BLM	
DEC 05 91	
DM	MN
ADM	FL
PA	SL
AO	BR
OPR	NRA
LRR	PRA
RGR	Lead Resp

RE: West Black Thunder Environmental Assessment

Dear Mr. Monroe:

I'm taking this opportunity to provide some key discussion points for you to consider in the West Black Thunder environmental assessment.

It has been the general practice of Thunder Basin Coal Company to give primary consideration to safety and environmental issues when there is competition with economic factors. They have an established and proven track record, particularly in the environmental reclamation effort as indicated by the numerous State and Federal awards they have received over each of the last five years.

With the additional tonnage provided in the West Black Thunder tract, Thunder Basin Coal employees will be assured of extended employment beyond the year 2000. This would not only secure employment for TBCC employees, but also help the State of Wyoming by providing additional royalties amounting to \$125 million. Also, at least one support job is created for each full-time position at TBCC, thus propagating the State and local economy.

Thunder Basin Coal employees truly have pride in the fact that mining operations can successfully co-exist with the environment.

I ask that you carefully consider these points I have mentioned as you progress in the environmental assessment of the West Black Thunder lease tract.

Sincerely,

Arne G. Rajala

2420(LB4)
WY1118907

December 3, 1991

Mr. James Monroe
BLN Casper District Office
1701 East 'E' Street
Casper, WY. 82601

re: Federal Coal Application WY1118907
West Black Thunder

Dear Mr. Monroe:

This is to express my support of the BLN's Coal Lease-by Application process. Especially in view of Thunder Basin Coal Company's interest in West Black Thunder.

It is with pride that I, as an employee, of TBCC see the contributions that we make to the people of Campbell County, both on a personal and a monetary level. Tax dollars are very important to the city, county, state and federal governments.

We are proud of the effort and concerns of our fellow workers in the environmental goals set by our company. It is evident when looking at the accomplishments in this area that the environment is of great concern to all of us at TBCC.

This lease would extend the life of the mine considerably, thereby enabling many people to attain a satisfactory life-style without detriment to the land on which we depend.

I urge you to confirm approval of the referenced application.

Sincerely Yours,
James E. Mattens
James E. Mattens
Mine Operations Supervisor

CASPER BLM	
DEC 05 91	
DM	MN
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OPR	NRA
LRR	PRA
RGR	Lead Resp

2420(LB4)
WY1118907

December 3, 1991

Mr. James Monroe
BLN Casper District Office
1701 East 'E' Street
Casper, WY. 82601

re: Federal Coal Application WY1118907
West Black Thunder

Dear Mr. Monroe:

This is to express my support of the BLN's Coal Lease-by Application process. Especially in view of Thunder Basin Coal Company's interest in West Black Thunder.

It is with pride that I, as an employee, of TBCC see the contributions that we make to the people of Campbell County, both on a personal and a monetary level. Tax dollars are very important to the city, county, state and federal governments.

We are proud of the effort and concerns of our fellow workers in the environmental goals set by our company. It is evident when looking at the accomplishments in this area that the environment is of great concern to all of us at TBCC.

This lease would extend the life of the mine considerably, thereby enabling many people to attain a satisfactory life-style without detriment to the land on which we depend.

I urge you to confirm approval of the referenced application.

Sincerely Yours,
S. J. Smart
S. J. Smart
Mine Operations Engineer

CASPER BLM	
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OPR	NRA
LRR	PRA
RGR	Lead Resp

Post-Net brand fax transmission memo 7871 (1 of copies)	
To: James Monroe	From: J. Johnson
CC: J.M.	CC: J. Johnson
Date: 12/3/91	Phone #: 939-1800
Fax #:	Fax #:

CASPER BLM
DEC 05 91

December 3, 1991

OMN MN
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PA SL
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OPR NRA
LRR PRA
RGR Lead Resp

James W. Monroe
BLM Casper District Office
1701 East 'E' Street
Casper, WY 82601

Dear Mr. Monroe:

I am writing in support of Thunder Basin Coal Company obtaining the West Black Thunder lease. Thunder Basin Coal Company employs approximately 500 people in Campbell County. For every full time position at Thunder Basin Coal Company at least one secondary job is created. The growth and success of this company has had a very positive impact on the economic development of both Wright and Gillette over the last ten years.

In addition to being one of the leading coal producers in the United States, Thunder Basin Coal Company has received numerous environmental recognition awards. In 1991 Thunder Basin Coal Company was the recipient of Atlantic Richfield Company's Environmental Achievement Award for Wildlife Habitat Development and Enhancement of Mined Land. Thunder Basin Coal Company has donated this \$25,000 award to further research and development of environmental projects. This action clearly demonstrates Thunder Basin Coal Company's commitment to protecting the environment now, and in years to come.

Being a recent college graduate, Thunder Basin Coal Company has given me the opportunity to grow and develop within a major American Company while living in the northwest region. This is an opportunity that, unfortunately, many of my colleagues were not able to enjoy due to the lack of industry in our region.

Please help Thunder Basin Coal Company remain one of the leading coal producers in Wyoming. Consider my request to support the West Black Thunder lease.

Sincerely,

Julia A. Johnson
Julia A. Johnson
Safety Advisor

CASPER BLM
DEC 05 91

OMN MN
ADM FL
PA SL
AO BRA
OPR NRA
LRR PRA
RGR Lead Resp

3-Dec-91

James W. Monroe
BLM Casper District Office
1701 East 'E' Street
Casper, WY 82601

RE: West Black Thunder Environmental Assessment

Dear Mr. Monroe:

First and foremost, as a native senior citizen of Campbell County raised on a ranch in northern Campbell County and receiving my education from Campbell County schools, and with several children who are natives of this state, I believe I can speak with direct experience regarding the positive effect that coal mining development and production has brought to this county and to the State of Wyoming. Education, work opportunity and community development have resulted from coal mining and because of this, my children who have chosen to stay in their native state of Wyoming have not been forced to leave the state to seek adequate employment. Every educational and working choice has been theirs to develop and obtain the most benefit from their efforts and abilities. So few states have that kind of advantage for the younger worker and still be able to retain a protection of the environment for urban, rural and recreational areas.

Raised to respect the lands and water, it gives me deep satisfaction to see these recovered and restored from mining operations to an even better quality than the original state at so many Campbell County Coal mines.

Secondly, as a senior citizen employee of Thunder Basin Coal Company, I have very closely observed the mining and restoration processes of Black Thunder Mine for about ten years. In spite of a period of dryness and low water tables, I have seen very little pollution of the air and have watched the land restored to a quality of range land far exceeding its original state. I have also watched the mining operation progress in such a way as to protect then restore and enhance the water ways. I have observed the taxation imposed on every ton of coal loaded and hauled from this mine for rehabilitation and recovery of the lands at eastern states coal mining operations and noted that the time would not ever come when such a tax would be necessary to restore the lands here. I have had to stop many times while traveling to and from and on the mine site to allow the wild animal life to go their natural ways undisturbed by the mining operations around them. I see the many Environmental awards that this Company has received (see attached sheet) and watch the extraordinary efforts and dedication of the Company employees who make this Company worthy of such awards and recognition. I see the Payroll and Taxes generated by the operation of Thunder Basin Coal Company and the strong efforts made to build and sustain ever better communities by TBCC employees. I see every effort made to maintain a safe working environment so each employee need not work in hazardous conditions.

ENVIRONMENTAL AWARDS

- * 1991 ARCO Environmental Achievement Award for Wildlife Habitat Development and Enhancement on Mined Land - \$25,000 awarded to further research and development of environmental and ecological projects.
- * Honorable Mention 1990 Wyoming Excellence in Surface Mining and Reclamation for "Innovative Revegetation Technology".
- * 1990 Special Merit Recognition for "Wildlife Habitat Development and Enhancement" from the National Environmental Awards Council.
- * 1989 Outstanding Conservation Award from the National Institute for Urban Wildlife for "Construction of Replacement Reservoir 26-SR-1".
- * First Place 1989 Wyoming Excellence in Surface Mining and Reclamation Award for "Wildlife Habitat Development and Enhancement".
- * First Place 1988 Wyoming excellence in Surface Mining and Reclamation Award for the "Rocky Hill Coal Gasification Land Farm Project".
- * Honorable Mention 1987 Wyoming Excellence in Surface Mining and Reclamation Award for "Construction of Rockpile Habitat for Small Mammals and Raptors".
- * First Place 1987 Wyoming Excellence in Surface Mining and Reclamation Award for "Construction of Replacement Reservoir 26-SR-1".

I see the efforts of those who are poorly informed or easily misguided who condemn mining operations and yet they and their families are among the first to enjoy the benefits to the community and the state from those very same mining operations.

I urge you, Mr. Monroe, to reach a positive decision about the West Black Thunder Environmental assessment and proceed with confidence so that the future of harvesting one of Wyoming's most valuable resources may come to pass extending both the life of this mine and the power utilized from this otherwise wasted resource.

Thank you for your attention to my request.

Sincerely yours,

Kathleen M. Walker

Kathleen M. Walker
Box 404
Wright, WY 82732

:Enc

CASPER BLM	
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RGR	Lead Resp

December 3, 1991

James W. Monroe
BLM Casper District Office
1701 East E Street
Casper, WY 82601

Dear Mr. Monroe:

I have been an employee of Thunder Basin Coal Company for the last eight years and I support the West Black Thunder Lease. During my employment at Thunder Basin Coal Company I have witnessed the company's strong environmental reclamation program successfully restore the mined land. In addition, Thunder Basin Coal Company has received numerous environmental achievement awards in the past few years.

Please consider my support of the West Black Thunder lease.

Sincerely,

Karl J. Mattix
Karl J. Mattix
Safety Advisor
Thunder Basin Coal Company

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LRR	PRA
RGR	Lead Resp

December 3, 1991

James W. Monroe
BLM Casper District Office
1701 East E Street
Casper, Wyoming 82601

Dear Mr. Monroe:

I am writing in regard to the West Black Thunder Environmental Assessment. I have been employed by Thunder Basin Coal Company at the Black Thunder Mine since August of 1976. Having lived in Wyoming for close to 30 years with a deep respect for wildlife and the outdoors, I initially had some concerns about the affect of mining on our beautiful state. None of my concerns ever became reality. The land where mining has been completed is restored to far better grass and productivity than was there prior to mining. This is no accident, a serious commitment to restoring the land, that goes beyond regulatory requirements, has obtained these results.

The additional coal reserves in the West Black Thunder lease application are critical to my future as well as the future of 500 friends and co-workers. Many of us plan to retire here, if possible, so these additional reserves are important to us. Failure to obtain West Black Thunder will most likely result in decreased coal shipments from 1996 into the future which translates to fewer jobs and less tax paying citizens.

Please move forward with the West Black Thunder Environmental Assessment as rapidly as possible. The positive impacts are real and are many in number. The possible negative impacts are only speculation (with no basis in fact) and are few in number from a very vocal minority most of whom don't even live in this area.

Sincerely,

Jerry Stanart
Jerry Stanart
10389 Hwy. 59
Gillette, Wyoming 82716

CASPER BLM	
DEC 18 91	
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RGR	Lead Resp

Dec 16, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe:

I am writing in response to the Thunder Basin Coal Federal Coal Lease Application. I have been working for Thunder Basin Coal for 7 1/2 years it is a real good job. I feel we need the new coal lease for future retirement, future jobs and also brings in revenue for the state.

Thunder Basin Coal has the best reclamation projects there is as a equipment operator I've seen good work on the projects. We need the new coal lease for jobs and to keep the economy going.

Sincerely,

Mark C. Nicolls
Mark C. Nicolls
Thunder Basin Coal Employee

CASPER BLM	
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RGR	Lead Resp

Dec 16, 1991

James W. Monroe
BLM Casper District Office
1701 East E St.
Casper, WY 82601

Rick Sellen
Rick Sellen
113 Sequoyia Dr
Gillette, WY
82716-4415

Dear Sirs:

I have been employed at Black Thunder Mine for eight years and I have found it to be a very good job. I am writing this letter in regard to the proposed West Black Thunder lease being considered. I am very hopeful that this lease is granted to Thunder Basin Coal Co. (TBCO) and as much as it would prove to be a very positive influence on both our economy and environment here in Wyoming. I point to Thunder Basin Coal Co.'s reclamation past record regarding reclamation and environmental protection. Again, I ask that this lease be granted to Thunder Basin Coal Co. (TBCO). This is very important to both the State of Wyoming and the employees of Black Thunder Mine. Thank you

Rick Sellen
Respectfully,
Rick Sellen

3420(LBA)
WVW118907

Dear Mr James Monroe

My Name is Ronald Holmes
I have worked at Black Thunder
mine for 14 years. I was born in
Chapone Wyo And have lived in
Wyoming all my life. I do not
want to live any where else.
I would like you to approve the
West Black Thunder Lease. To Black
Thunder Mine. So that I may keep
working for many more years at
Black Thunder mine. and not have
to look out side the state for
work like some of the people.
I grow up with had to do.
Please Approve the Lease

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Thank you
Ronald Holmes
Wright, Wyo - 82732
464-1921

3420(LBA)
WVW118907

Dear Mr Monroe:

I have worked at Black Thunder
now 12 years and it has been very
generous to me and my family. I hope to
work there many more years.

I write this letter to encourage you
to consider the West Black Thunder lease
and I am hopeful that you will grant this
lease to Thunder Basin Coal Co

Respectfully
Ronald Holmes

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RGR	Lead Resp

3420(LBA)
WVW118907

Dear Sir

I'm writing in hope of gaining your support for the
pending acquisition of the West Black Thunder lease by
Thunder Basin Coal Co.

If Thunder Basin Coal Co. is able to acquire this
lease it would extend the life of the mine by
up to thirteen years, which would provide already
employment for many people in Wyoming as well
as millions of dollars in royalties for the state.

Thunder Basin Coal Co. makes a very positive
environmental statement by being one of the leaders
in mine reclamation and has been credited with
numerous environmental awards.

The successful acquisition of this lease is of
great importance to me personally, I have spent
most of my life in Wyoming and hope to raise
my family here. I've been employed by Thunder
Basin Coal Co for eleven years and the successful
acquisition of this lease will help insure my
retirement with this company.

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RGR	Lead Resp

Respectfully
Wally C. Hardy

3420(LBA)
WVW118907

Mr. James Monroe
BLM Basin District Office
1701 East E St
Casper, Wyo. 82401
Dear Sir Monroe:

Being an employee of Thunder Basin
Coal Company for the past thirteen
years, I have seen the positive economic
improvement of the Area. Thunder Basin
has proven its ability to uphold
the highest quality in environmental
control.

Thunder Basin Coal Co. and will
continue to be a leader in the coal
industry.

CASPER BLM	
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LRR	PRA
RGR	Lead Resp

Wally C. Hardy
Wright, Wyo

3420(LBA)
WYU118907

Dec 15, 1991
Mr James Monroe
3rd Floor Casper District Office
1761 East E ST
Casper, Wyo 82401

CASPER BLM	
DEC 18 91	
DM	MN
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Re Fed Coal lease Application WYU118907

Dear Mr Monroe

In regards to the Federal Coal lease application WYU 118907. I believe very strongly in supporting ARCO Black Thunder mine application to mine coal from this property. I have worked at Black Thunder since 1978 and have observed first hand their commitment to the environmental concerns in protecting this area.

Being born and raised in north-east Wyo they have proved to me that they are as dedicated as I am in preserving this area.

I urge you to support ARCO's application for this lease.

Sincerely,
Franklin Evans
Box 475
Horton, Wyo 82730

3420(LBA)
WYU118907

Dear Mr. James W. Monroe

I have recently become employed at Thunder Basin Coal Co. as a Contractor and believe it is a very generous opportunity in my career. I hope you will grant the proposal of the West Black Thunder lease. It would ensure myself and others to remain employed at Black Thunder and within Campbell County.

Respectfully,

Kelly G. Hintz

CASPER BLM	
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RGR	Lead Resp

3420(LBA)
WYU118907

Dear Mr Monroe,

In regards to the west Black Thunder lease. I would like you to consider Thunder Basin coal for this lease. As this would be very beneficial to myself, myself and Hellette and the state of Wyoming. I have worked here for ten years and have enjoyed living and working in Wyoming. I look forward to at least ten more years.

Sincerely Paul Vetter

CASPER BLM	
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3420(LBA)
WYU118907

Dear Mr. Monroe

I am writing to encourage the granting of West Black Thunder Coal lease to Thunder Basin Coal Co. I have worked at this mine for more than 12 years and it has been good to me. The granting of this lease will be beneficial to many people. The new lease will put more people to work and help to stabilize the economy in this area and the state. There will be a lot of people retiring in the next few years and the new lease would help in opening employment opportunities for a lot of people.

I appreciate your consideration of granting this lease to Thunder Basin Coal Co.

Respectfully Yours,
Charles Jones

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3420(CB4)
WYUS 112907

Dear Mr. Monroe,

I am an employee of Thunder Basin Coal Company and have been for a number of years. I would also like to be here for awhile longer. I am hopeful that you will grant the West Black Thunder lease to Thunder Basin. I believe it would be very beneficial, not only to me, but the community and state as well.

Thank you

Doug Hunter
G. Hette Wyo

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3420(CB4)
WYUS 112907

Dear Mr. Monroe

I have worked at Black Thunder Mine for sometime and enjoy the benefits and the job. I would like to encourage the approval of the west black thunder lease as I would like to continue to work here + others here.

Sincerely
H. Hardy
G. Hette Wyo

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3420(CB4)
WYUS 112907

December 1, 1991

James W. Monroe
BLM Casper District Office
1701 East 'E' Street
Casper, WY 82601

Dear Mr. Monroe:

Thunder Basin Coal Company is a responsible company that takes care of the environment. They employ a department of well educated and well trained people in their environmental department.

They comply with federal and state regulations in regard to re-establishing mined areas. They even go over and above what the federal and state requires for reclaiming mined areas.

They pay burdensome taxes both state and federal. These taxes support the agencies that try to put them out of business.

They employ in excess of 500 people. The people they employ also pay taxes on the wages they earn and they contribute greatly to the local economy.

If you want to investigate something worthwhile, you should investigate these environmentalist such as the Sierra Club for subversive activists. Some members of the Powder River Resources Council have ulterior motives for their involvement in the group. They want to keep the coal business back in the eastern states until they can organize the local mines. The reason being the eastern coal people are all union and this is where their funds come from.

I feel that the approval should be given to the West Black Thunder lease it will benefit the community and the government.

Jack Matheson
Jack Matheson
PO Box 622
Wright, WY 82732

CASPER BLM	
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3420(CB4)
WYUS 112907

December 1, 1991

James W. Monroe
BLM Casper District Office
1701 East 'E' Street
Casper, WY 82601

Dear Mr. Monroe:

Thunder Basin Coal Company is a responsible company that takes care of the environment. They employ a department of well educated and well trained people in their environmental department.

They comply with federal and state regulations in regard to re-establishing mined areas. They even go over and above what the federal and state requires for reclaiming mined areas.

They pay burdensome taxes both state and federal. These taxes support the agencies that try to put them out of business.

They employ in excess of 500 people. The people they employ also pay taxes on the wages they earn and they contribute greatly to the local economy.

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I feel that the approval should be given to the West Black Thunder lease it will benefit the community and the government.

Cassie Casner
Cassie Casner
1 Sierra Drive
Gilletta, WY 82716

CASPER BLM	
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3420 LBA
WY118907

DECEMBER 16, 1991

MR. JAMES MONROE
BLM CASPER DIST. OFFICE
1701 EAST "E" STREET
CASPER, WY. 82601

RE: FEDERAL COAL LEASE APPLICATION WY118907

DEAR MR. MONROE,
AS A NATIVE OF WYOMING AND A RESIDENT OF A SMALL
COMMUNITY, I AM WRITING IN SUPPORT OF THUNDER BASIN
COAL COMPANY'S APPLICATION FOR ADDITIONAL RESERVES.

NOT ONLY WOULD REJECTION OF THIS APPLICATION HURT
CAMPBELL AND WESTON COUNTY BUT THE WHOLE STATE OF
WYOMING. THE REVENUE THAT THIS COMPANY PUTS INTO
THE STATE MONEY SYSTEM IS VERY MUCH NEEDED. NOT ONLY
FOR THE STATE SYSTEM, BUT ALSO FOR THE COMMUNITIES
WHERE EMPLOYEES HAVE MADE THEIR HOMES.

IF EVERYONE MADE THE EFFORT THAT THE COAL MINES DO TO
PROTECT THE ENVIRONMENT WE WOULDN'T HAVE TO WORRY HERE
IN WYOMING OR ANY OTHER STATE.

SINCERELY,
James K. King
JAMES KING

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3420 LBA
WY118907

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23 North Summit Avenue
Newcastle, WY 82701
December 16, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe,
As a resident of Weston county, I am fully aware of the economic
benefit of Black Thunder Mine's nearby presence. Both we, and
the entire state, need its continued operation, particularly
since their restoration of the land is so well done.

I am strongly in support of Federal Coal Lease Application WY118907.

Sincerely,

Robert King

Robert King

3420 LBA
WY118907

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21 Timberline Road
Newcastle, WY 82701
December 16, 1991

Mr. James Monroe
BLM Casper District Office
1701 East "E" Street
Casper, WY 82601

Dear Mr. Monroe,
I would like to register my support for Federal Coal Lease
Application WY118907. The Powder Basin coal mines, particularly
Black Thunder Mine, have proved their dedication to environmental
reclamation, and their economic benefit is a necessity in
Weston County.

Sincerely,

Frank McGinty

Frank McGinty

3420 LBA
WY118907

Dear Mr. Monroe

*I would like to encourage you
to grant Black Thunder Mine the
requested Black Thunder lease
My family & many other families future
wellfare depends on this lease*

CASPER BLM	
DEC 18 91	
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<input type="checkbox"/> RGR	<input type="checkbox"/> Lead Resp

*Respectfully,
W.A. Smith*

Dear Mr. Monroe

I am writing you to encourage you to Grant Black Thunder mine the West Black Thunder Lease. The Times of Snow country must be about our local economy plus Wyoming.

Thank you
Ed Shugart

CASPER BLM	
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RGR	Lead Resp

Mr. James Monroe
34 M Casper District Office
1701 East "E" Street
Casper, Wyo. 82601

CASPER BLM	
OCT 18 91	
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LRR	PRA
RGR	Lead Resp

Dear Mr. Monroe

People and jobs is what makes a state strong in every area that you can think of, without either one of these two ingredients, your cup of life as a state will soon be full of dust... Choking trying to stay alive.

Black Thunder's need for reclamation and the environment speaks for itself. Other industries in the state should take notice.

I feel the economic impact on getting the new lease, will by far outway the environmental impact. I fully agree we need to take care of our state in every way we can, but I don't feel we need to put peoples jobs and their families future on the line cause a lease was held up for us not the state will provide the eye.

Black Thunder will feel it full of life for a long time to come.

Thank you very much
Dan Darity

Tim Weisbach
P. # 703
WYO 82712

Mr. James Monroe
34 M Casper District Office
1701 East E Street
Casper WY 82601

RE Federal Coal Lease Application WYU 118907

Dear Mr. Monroe

I am writing to encourage approve the lease application by Thundebasin coal of the above numbered application also known as West Black Thunder.

As a resident and lease owner of Campbell County I feel that obtaining this lease would have a long term positive economic impact for Campbell co and for the state of Wyoming.

Yours truly
Tim Weisbach

CASPER BLM	
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AD	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

Mr. James Monroe

I have worked in Campbell County for ten years and would like to continue working here. This is why I would like to see TBCC get the lease of West Black Thunder. It would keep the local economy moving in a positive direction.

Sincerely
Jenny Griffin

CASPER BLM	
OCT 18 91	
ADM	MN
ADM	FL
PA	SL
AD	BRA
OPR	NRA
LRR	PRA
RGR	Lead Resp

34720(LBA)
WYU0112907

December 20 1991

Mr James Monroe
Bism Casper District Office
1701 East E Street
Casper WY 82601

CASPER 8144	
DEC 24 '91	
COM	MIN
ADM	FL
PA	SL
AO	BRA
DPR	NRA
LRR	PRA
RGR	Lead Rep

11427

RE: Federal Coal Lease Application WYU11 8907

Dear Mr. Monroe

As a coal miner and a Thunder
Basin Coal Comp. employee I highly support
that Thunder Basin Coal Comp get the most
lease. Its proven that the mine recleaving
it land is better than natural ground
by all the wildlife that lives out there.
And also so the people working there can
continue living and working in Wyoming.

Sincerely + Thank you
Terrence L. Lion

Response to Letters 30 through 92

The preceding letters, and the fact that they were received in this number indicate a significant support for coal mining in general and the Thunder Basin Coal Company specifically in northeastern Wyoming. These comments will be taken into account in the Decision Record.

VIII. West Black Thunder Final EA Mailing List

Converse County Commissioners
Drawer 990
Douglas, WY 82633

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City Administrator
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Appropriations Committee
910 East 3rd Street
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Senator John Perry
412 North Main
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Senator Jerry Dixon
31 South Summit
Newcastle, WY 82701

Senator Michael B. Enzi
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Representative John J. Hines
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Representative Dick Wallis, Chairman
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Oglala Sioux Tribal Council
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Governor of Montana
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Fifty Copies of the West Black Thunder Final EA were sent to the Thunder Basin Coal Company, Attention:

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Ms. Sue Hilim
Mr. Dean L. Roberts
Mr. Patrick T. Tyrrell
Ms. Bonita K. Short
Mr. Ralph Olsen
Mr. Robert L. Moore
Mr. Jim Van Emmerik
Mr. Dave Shrum
Mr. Fred Schmitz
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Mr. Marvin Senne
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Mr. Kenneth R. Miller
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Mr. Douglas A. Freeland
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