BLM

FINAL Environmental Impact Statement for the Buckskin Mine Hay Creek II Coal Lease Application WYW-172684

Wyoming High Plains District

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

July 2011

Pronghorn grazing on completed reclamation at Buckskin Mine.

MISSION STATEMENT

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

BLM/WY/PL-11/045+1320

Cover photo: Buckskin Mine 2007.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming High Plains District
2987 Prospector Drive
Casper, Wyoming 82604-2968

TAKE PRIDE IN AMERICA

In Reply Refer to:
3425 (LBA)(WYP00)
WYW172684
Buckskin Mine Hay Creek II Coal EIS

JUL 19 2011

Dear Reader:

The Bureau of Land Management (BLM) has prepared this Final Environmental Impact Statement (EIS) to document and disclose the results of the environmental analyses of an application received by BLM to lease a maintenance tract of Federal coal approximately 12 miles north of the city of Gillette in the Powder River Basin, Wyoming. The tract is referred to as the Hay Creek II LBA tract. A copy of the EIS document is provided for your review. The final EIS may also be reviewed at the following website:

http://www.blm.gov/pgdata/content/wy/en/info/NEPA/documents/hpd/HayCreekII.html

Copies of the Final EIS are also available for public inspection at the following BLM Offices:

Bureau of Land Management
Wyoming State Office
5353 Yellowstone Road
Cheyenne, WY 82009

Bureau of Land Management
Wyoming High Plains District Office
2987 Prospector Drive
Casper, Wyoming 82604

The Draft EIS was published in March 2010, and the 60-day comment period on the draft document ended on May 10, 2010. A formal public hearing on the application to lease Federal coal was held in Gillette, Wyoming, on April 22, 2010. The purpose of the hearing was to receive comments on the proposed coal lease, on the fair market value, and on the maximum economic recovery of the Federal coal resources included in the tract. There were no statements presented at the formal hearing. Written comments were received from 10 individuals, agencies, businesses, and organizations, during the 60-day public review period. The comment letters received on the Draft EIS during the 60-day public review period have been published as part of the Final EIS in appendix D.

A 30-day review period on this Final EIS will commence on the date the Environmental Protection Agency (EPA) publishes a Notice of Availability in the Federal Register. The BLM will also publish a Notice of Availability in the Federal Register. The BLM will accept public comments on this Final EIS for thirty (30) days commencing on the date the EPA publishes its Notice of Availability in the Federal Register.

If you wish to comment on the Final EIS, your comments should relate directly to the document. Comments should be as specific as possible, and the locations in the document to which you are commenting on should be cited. The BLM is required to respond in the record of decision

(ROD) to all substantive comments submitted. Substantive comments should: (1) give any new information that could alter conclusions; (2) show why or how analysis or assumptions in the Final EIS are flawed; (3) show errors in data, sources, or methods; or (4) request clarifications that bear on conclusions. Opinions or preferences will not receive a formal response. However, they will be considered and included as part of the BLM decision-making process.

This Final EIS was prepared pursuant to the National Environmental Policy Act and applicable regulations, and other applicable statutes, to address possible environmental and socioeconomic impacts that could result from the Buckskin Mine Hay Creek II coal lease application. This Final EIS is not a decision document. Its purpose is to inform the public and agency decision-makers of the impacts associated with leasing some or all of the Hay Creek II Federal coal tract study area to an existing mine in the Wyoming Powder River Basin and to evaluate alternatives to leasing the Federal coal included in the tract as applied for.

Comments, including names, street addresses, and email addresses of respondents, will be on file and open for public review at the Wyoming High Plains District Office during regular business hours, and will be included as part of the ROD posted at the above listed website. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Though we cannot guarantee anonymity, such requests will be honored to the extent allowable by law. All submissions from organizations, businesses, and individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Please send written comments to the Bureau of Land Management, High Plains District Office, Attn: Teresa Johnson, 2987 Prospector Drive, Casper, WY 82604. Written comments may also be emailed to the attention of Teresa Johnson at: *hay_creek_II_WYMail@blm.gov*. Email comments must include the name and mailing address of the commentor to receive consideration. Written comments may also be faxed to the attention of Teresa Johnson at (307) 261-7587.

If you have any questions or would like to obtain a copy of this Final EIS, please contact Lesley Collins at (307) 261-7603, or at the above BLM Wyoming High Plains District Office address.

Sincerely,

Eric K Fuse

for Stephanie Connolly
District Manager

FINAL ENVIRONMENTAL IMPACT STATEMENT
HAY CREEK II COAL LEASE APPLICATION
CAMPBELL COUNTY, WYOMING

ABSTRACT

Lead Agency: USDI, Bureau of Land Management, High Plains District Office, Casper, Wyoming

Cooperating Agencies: USDI, Office of Surface Mining Reclamation and Enforcement, Denver, Colorado

Wyoming Department of Environmental Quality (all divisions), Cheyenne, Wyoming

For Further Information Contact: Teresa Johnson, Bureau of Land Management, 2987 Prospector Drive, Casper, WY 82604; (307) 261-7600

This final environmental impact statement (EIS) assesses the environmental consequences of a decision by the Bureau of Land Management (BLM) to hold a competitive, sealed-bid sale and issue a lease for a federal coal maintenance tract in Campbell County, Wyoming, as a result of a coal lease application submitted by Kiewit Mining Properties, Inc. (Kiewit). As applied for, the Hay Creek II coal lease-by-application (LBA) tract includes approximately 419 acres containing approximately 77.2 million tons of federal coal. If a lease sale is held and the applicant acquires the lease, Kiewit proposes to mine the tract as a maintenance lease for the existing, adjacent Buckskin Mine.

This final EIS describes the physical, biological, cultural, historic, and socioeconomic resources in and around the LBA tract. The alternatives in the final EIS consider the impacts of leasing the tract as applied for, leasing an alternative tract configuration, and not leasing a tract. Impact analyses focused on resource issues and concerns identified during public scoping conducted for the Hay Creek II LBA and during previous analyses conducted for coal leasing actions associated with Buckskin and other local coal mines. Recent concerns related to leasing coal and its subsequent development include: impacts on groundwater, air quality, wildlife, cultural resources, paleontological resources, socioeconomics, loss of livestock grazing areas, conflicts with oil and gas development, cumulative impacts related to ongoing surface coal mining and other proposed development in the Wyoming Powder River Basin, greenhouse gas emissions, ozone, and global climate change.

This final EIS, in compliance with Section 7(c) of the Endangered Species Act as amended, identifies any endangered or threatened species likely to be affected by the Proposed Action and alternatives.

The final EIS is open for a 30-day review period beginning on the date that the U.S.

Comments postmarked or received on or before the end of the 30-day review period will be considered during preparation of the Record of Decision (ROD). If the BLM decides to hold a sale for the Hay Creek II lease, the final tract configuration will be defined in the ROD.

HAY CREEK II COAL LEASE APPLICATION
FINAL ENVIRONMENTAL IMPACT STATEMENT

Prepared by

ICF International
Gillette, Wyoming

Under the Direction of

U.S. Department of the Interior
Bureau of Land Management
High Plains District Office
Casper, Wyoming

and

Cooperating Agencies

U.S. Department of Interior
Office of Surface Mining
Reclamation and Enforcement
Denver, Colorado

Wyoming Department of Environmental Quality
All Divisions
Cheyenne, Wyoming

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Abbreviations and Acronyms Used in this Report

µeq/L	microequivalents per liter
µg/m³	micrograms per cubic meter
AQRVs	air quality related values
AVF	alluvial valley floor
B.P.	before present
BACT	best available control technology
BAM	Belle Ayr Mine
BHP	Black Hills Power
BLM	U.S. Bureau of Land Management
BNSF	Burlington Northern Santa Fe
Btu	British thermal units
C	Celsius
C2P2	Coal Combustion Products Partnership
CAA	Clean Air Act
CBNG	coal bed natural gas
CCPs	coal combustion products
CCSD	Campbell County School District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CMGM	coal mine groundwater model
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	equivalent CO_2
Collins Road	Campbell County Road 23

Corps	U.S. Army Corps of Engineers
CP	Canadian Pacific Railway Ltd.
dB	decibel
dBA	A-weighted decibel
DM&E	Dakota, Minnesota and Eastern Railroad Corporation
DOE	U.S. Department of Energy
dv	deciview
EC	electrical conductivity
EIS	environmental impact statement
EOR	enhanced oil recovery
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act of 1973, as amended
F	Fahrenheit
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy Management Act
FMR	federal mineral royalties
GAGMO	Gillette Area Groundwater Monitoring Organization
GHG	greenhouse gas
GSP	gross state product
HFCs	hydrofluorocarbons
I-90	Interstate 90
IMPROVE	Interagency Monitoring of Protected Visual Environments
Kiewit	Kiewit Mining Properties, Inc.
kV	kilovolt
LBA	lease by application
L_{DN}	day-night noise levels

L_{eq}	equivalent noise level
LRPL	least restrictive proposed limit
MAAQS	Montana Ambient Air Quality Standard
McGee Road	Campbell County Road 73
mph	miles per hour
MRPL	most restrictive proposed limit
MSHA	Mine Safety and Health Administration
MW	megawatts
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEAP	natural events action plan
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWLSWG	Northeast Wyoming Local Sage-Grouse Working Group
OSHA	Occupational Safety and Health Administration
OSM	Office of Surface Mining Reclamation and Enforcement
P&M	Pittsburg and Midway Coal Mining Company
PFCs	perfluorocarbons
PM_{10}	particulate matter measuring 10 micrometers or less in diameter
$PM_{2.5}$	particulate matter measuring 2.5 microns or less in diameter
PRB	Powder River Basin

PRRCT	Powder River Regional Coal Team
PSD	prevention of significant deterioration
REMI	REMI Policy Insight
RMP	resource management plan
ROD	record of decision
RV	recreational vehicle
SARA	Superfund Amendments and Re-authorization Act
scf/ton	cubic feet of methane per ton of coal mined
SEO	Wyoming State Engineer's Office
SHPO	State Historic Preservation Office
SIP	state implementation plan
SMCRA	Surface Mining Control and Reclamation Act of 1977
SO_2	sulfur dioxide
TBNG	Thunder Basin National Grassland
TDS	total dissolved solids
TEOM monitor	Tapered Element Oscillating Microbalance monitor
TSP	total suspended particles
UP	Union Pacific
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USGS CHIA	Cumulative Potential Hydrologic Impacts of Surface Coal Mining in the Eastern Powder River Structural Basin, Northeastern Wyoming
VOCs	volatile organic compounds
VRM	visual resource management
WAAQS	Wyoming Ambient Air Quality Standards
WDEQ	Wyoming Department of Environmental Quality
WGFD	Wyoming Game and Fish Department

WIA	Wyoming Infrastructure Authority
WOGCC	Wyoming Oil and Gas Conservation Commission
WSO-RMG	The BLM Wyoming State Office–Reservoir Management Group
Wyoming PRB Oil and Gas EIS	Final Environmental Impact Statement and Proposed Plan Amendment for the PRB Oil and Gas Project, referred to as the

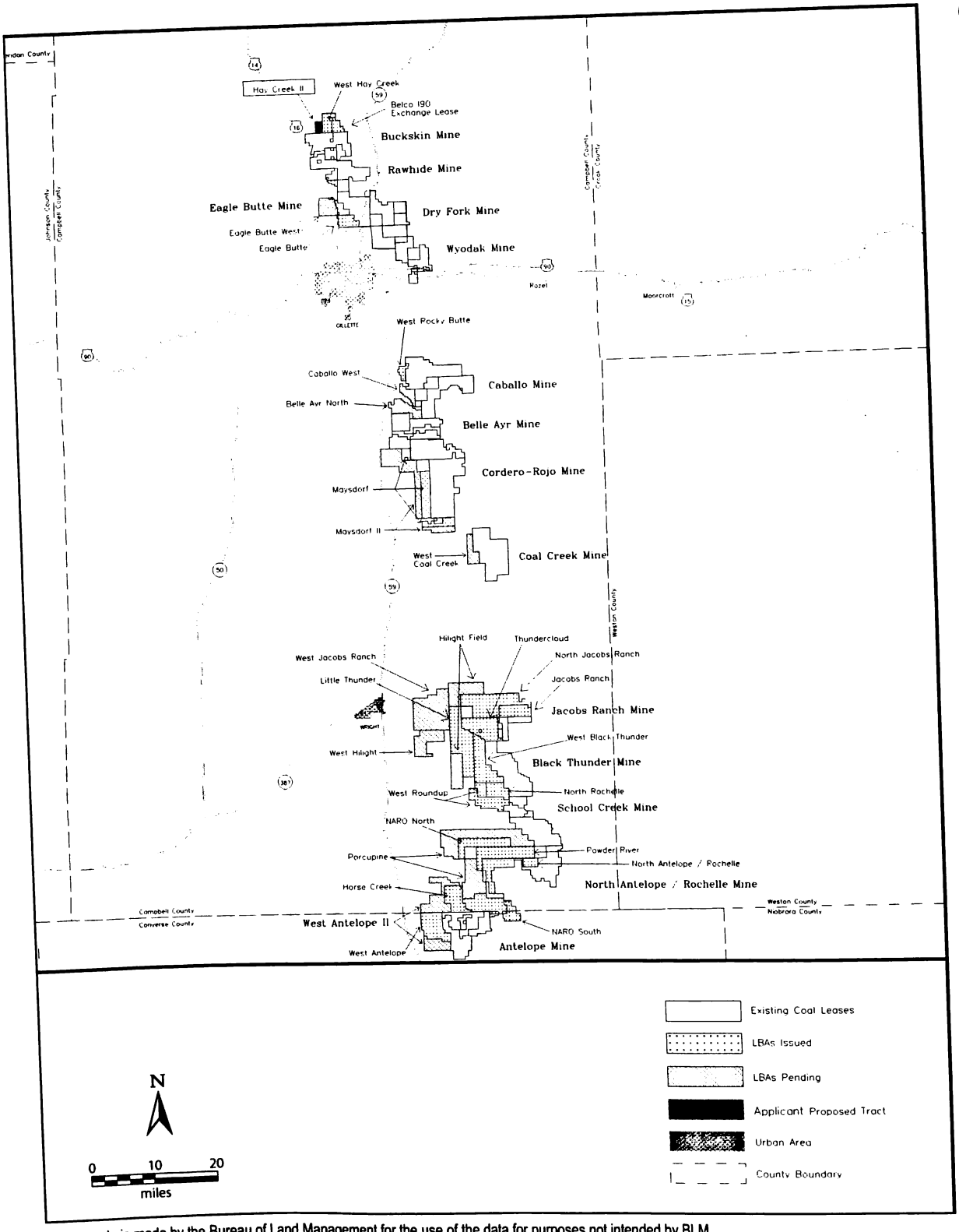
EXECUTIVE SUMMARY

Introduction

The U.S. Bureau of Land Management (BLM) has prepared a final environmental impact statement (EIS) for the Hay Creek II coal lease application (Proposed Action). The final EIS was prepared in accordance with the National Environmental Policy Act (NEPA) and its associated rules and guidelines, and presents the BLM's analysis of environmental impacts from the Proposed Action and alternatives. The BLM will use this impact analysis to make a leasing decision for federal coal reserves adjacent to the Buckskin Mine. A federal coal lease does not authorize mining to occur, but is the first step in that process. The lease merely grants the lessee the exclusive right to pursue a mining permit for the coal tract subject to the terms of the lease, the mining permit itself, and all applicable state and federal laws. Permits to mine are issued by authorized federal and/or state agencies only after a lease has been secured and all appropriate agencies have reviewed and approved an extensive permit application. That application document provides information describing a wide range of baseline resources, as well as detailed mining, mitigation, and reclamation plans.

Background

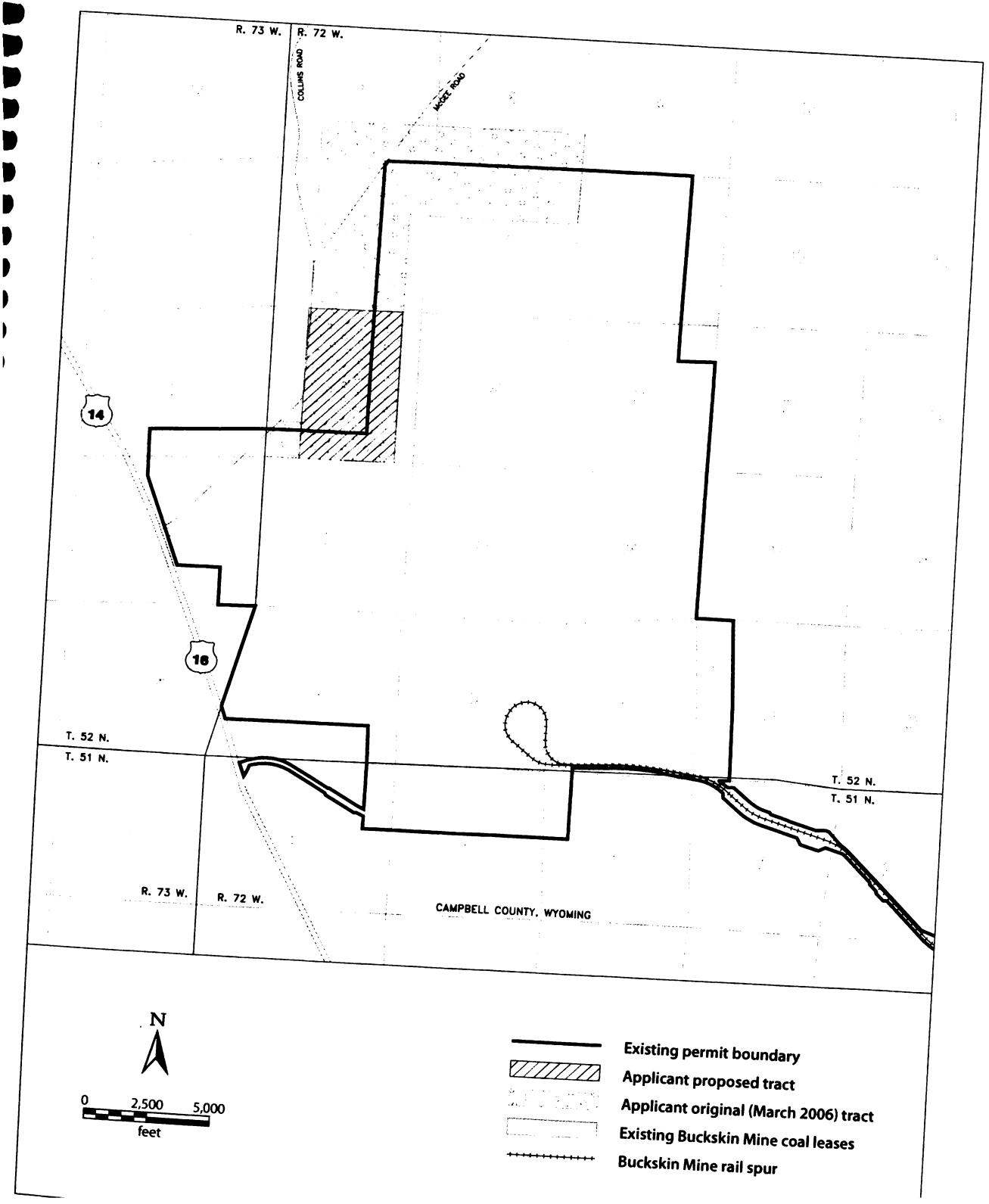
On March 24, 2006, Kiewit Mining Properties, Inc. (Kiewit), filed the Hay Creek II coal lease application with the BLM for federal coal reserves included in a tract located northwest of and immediately adjacent to the existing Buckskin Mine permit area, approximately 12 miles north of Gillette, Campbell County, Wyoming (map ES-1). The mine is operated by the Buckskin Mining Company, a directly held subsidiary of Kiewit. The Hay Creek II lease by application (LBA) was assigned BLM case file number WYW-172684. The federal coal reserves were applied for as a maintenance tract for the Buckskin Mine, which means the coal tract is adjacent to, and can be recovered by, the existing active coal mine. The intent of the proposed tract is to extend the life of existing operations rather than to expand the mine. Since submitting its original application in 2006 (see "applicant original [March 2006] tract" on map ES-2), Kiewit modified its lease application due to changing needs. The applicant proposed tract (proposed tract) from November 2008 was analyzed in the draft EIS. Unforeseen LBA processing delays caused Buckskin to lose the mechanical advantage provided by the November 2008 modification. Consequently, on September 3, 2010, Kiewit requested that the BLM consider a tract configuration under Alternative 2 (see chapter 2) based on the original tract configuration applied for in March 2006. Because the analyses in the draft EIS encompassed all configurations of Kiewit's proposed tract, they are still valid for the final EIS. Therefore, for the purposes of this analysis, the proposed tract remains unchanged from the draft EIS.



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map ES-1

General Location Map with Federal Coal Leases and LBA Tracts



The BLM, Wyoming State Office, Division of Minerals and Lands, has reviewed Kiewit's application for the proposed tract. That office determined that the lease application and lands involved meet the regulatory requirements for an LBA under 43 Code of Federal Regulations (CFR) 3425. The Powder River Regional Coal Team reviewed Kiewit's application at a public meeting held on April 19, 2006, in Casper, Wyoming, and subsequently recommended that the BLM process it.

Evaluation and Environmental Review Process

To process an LBA, the BLM must evaluate the quantity, quality, maximum economic recovery, and fair market value of the federal coal. The BLM also must fulfill the requirements of NEPA by evaluating the environmental impacts of leasing that coal. NEPA requires the BLM to consider and evaluate reasonable alternatives to the Proposed Action, including a "no action" alternative. This EIS has been prepared to evaluate the site-specific and cumulative environmental impacts of leasing and recovering the federal coal reserves in the proposed tract or an alternative tract configuration, as determined by the BLM. In keeping with the purpose of an EIS, the analyses presented in this document are based primarily on existing information.

As stated, the BLM leasing process does not authorize mining of federal coal reserves; applicants must obtain permits from appropriate federal and/or state agencies to mine the coal. However, because mining is a logical consequence of issuing a maintenance lease to an existing operation, the impacts of mining the coal are considered in this EIS.

The BLM will use the analyses in this EIS to decide whether to hold a competitive sale and issue a lease for the federal coal reserves in the proposed tract or an alternative tract configuration. The LBA process by law and regulation is an open, public, competitive sealed-bid process. If a sale is held for a tract, the bidding would be open to any qualified bidder; it would not be limited to the applicant. A coal lease is issued to the highest bidder at the sale, if a federal sale panel determines that the high bid meets or exceeds the fair market value of the coal as determined by the BLM's economic evaluation, and if the Department of Justice determines that no antitrust violations would result from assigning the lease to the high bidder. A decision to lease these federal coal reserves would be in conformance with the BLM Resource Management Plan for the Buffalo and Casper field offices.

Regardless of whether the successful bidder is the applicant or a new operator, the lessee would be required to submit a permit application, including detailed mining, monitoring, mitigation, and reclamation plans to the Wyoming Department of Environmental Quality (WDEQ) for review. The operator would also be required to submit a Resource Recovery and Protection Plan to the BLM for review. Before mining operations could begin in the new tract, the mining permit must be approved by the WDEQ, the Resource Recovery and Protection Plan must be approved by the BLM, and a Mineral Leasing Act mining plan must be approved by the Assistant Secretary of the Interior.

Other agencies will also use this EIS analysis to make decisions related to leasing and mining the federal coal in the proposed tract or an alternative tract configuration. The Office of Surface Mining Reclamation and Enforcement and all divisions of the WDEQ are cooperating agencies on this EIS. Both the U.S. Environmental Protection Agency (EPA) and the BLM will publish a notice of availability of the final EIS in the *Federal Register*. After a 30-day availability period, the BLM will make a decision to hold or not to hold a competitive lease sale for the federal coal reserves in the final tract configuration. The record of decision (ROD) for the tract is mailed to all parties on the mailing list and others who commented on the draft EIS during the comment period. Members of the public and/or the applicant can appeal the BLM decision to hold or not to hold a competitive sale and issue a lease for the final tract configuration. The BLM decision must be appealed within 30 days from the date that the notice of availability for the ROD is published in the *Federal Register*. The decision can be implemented at that time if no appeal is received. If a competitive lease sale is held, it will follow the procedures set forth in 43 CFR 3422, 43 CFR 3425, and BLM Handbook H-3420-1 (Competitive Coal Leasing).

After a competitive coal lease sale is held, but before the lease is issued, the BLM must solicit the opinion of the Department of Justice on whether the planned lease issuance creates a situation inconsistent with federal antitrust laws. The Department of Justice has 30 days to make this determination. If the Department of Justice has not responded in writing within the 30 days, the BLM can issue the lease.

Purpose and Need

The purpose of the Proposed Action is to extend the life of existing operations at the Buckskin Mine. The Proposed Action would not expand operations at the Buckskin Mine, but would extend the life of the mine by approximately two years[1].

More broadly, the Proposed Action responds to the continued demand for coal in the United States, primarily for the purpose of generating electricity. According to the U.S. Energy Information Administration (2008a), the United States has the world's largest known coal reserves. Demand for this coal is driven by the electric power sector, which accounts for about 92% of coal consumption (U.S. Energy Information Administration 2008a, 2008b). Approximately half of the electricity currently generated in the United States comes from coal (U.S. Department of Energy 2009a). Wyoming coal is used to generate electricity in 37 other states (Wyoming Mining Association 2009).

The BLM recognizes that the continued extraction of coal is essential to meet the nation's future energy needs and goals. Consequently, private development of federal coal reserves is integral to the BLM coal leasing program under the authority of the Mineral Leasing Act of 1920, as well as the Federal Land Policy Management Act and the Federal Coal Leasing Amendments Act of 1976. Under the Federal Land Policy Management Act, the BLM is mandated to manage public

lands for multiple-use so that the lands are utilized in the combination that will best meet the present and future needs of the American people.

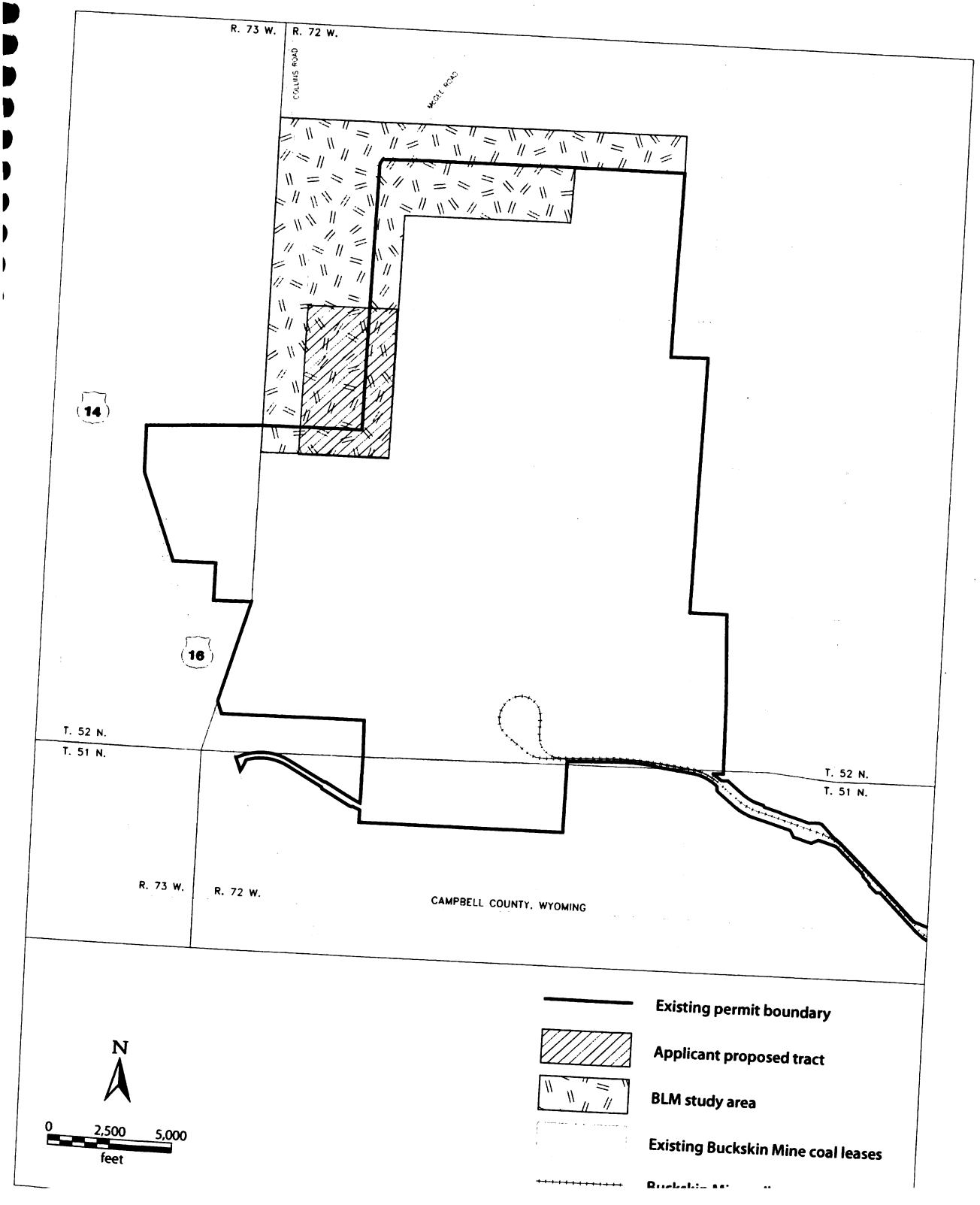
Management of federal coal resources—leasing, mining, and selling—in the Power River Basin (PRB) contributes to a reliable supply of low-sulfur compliance coal for electric power generation in the United States. This domestic supply enables coal-fired power plants to meet current

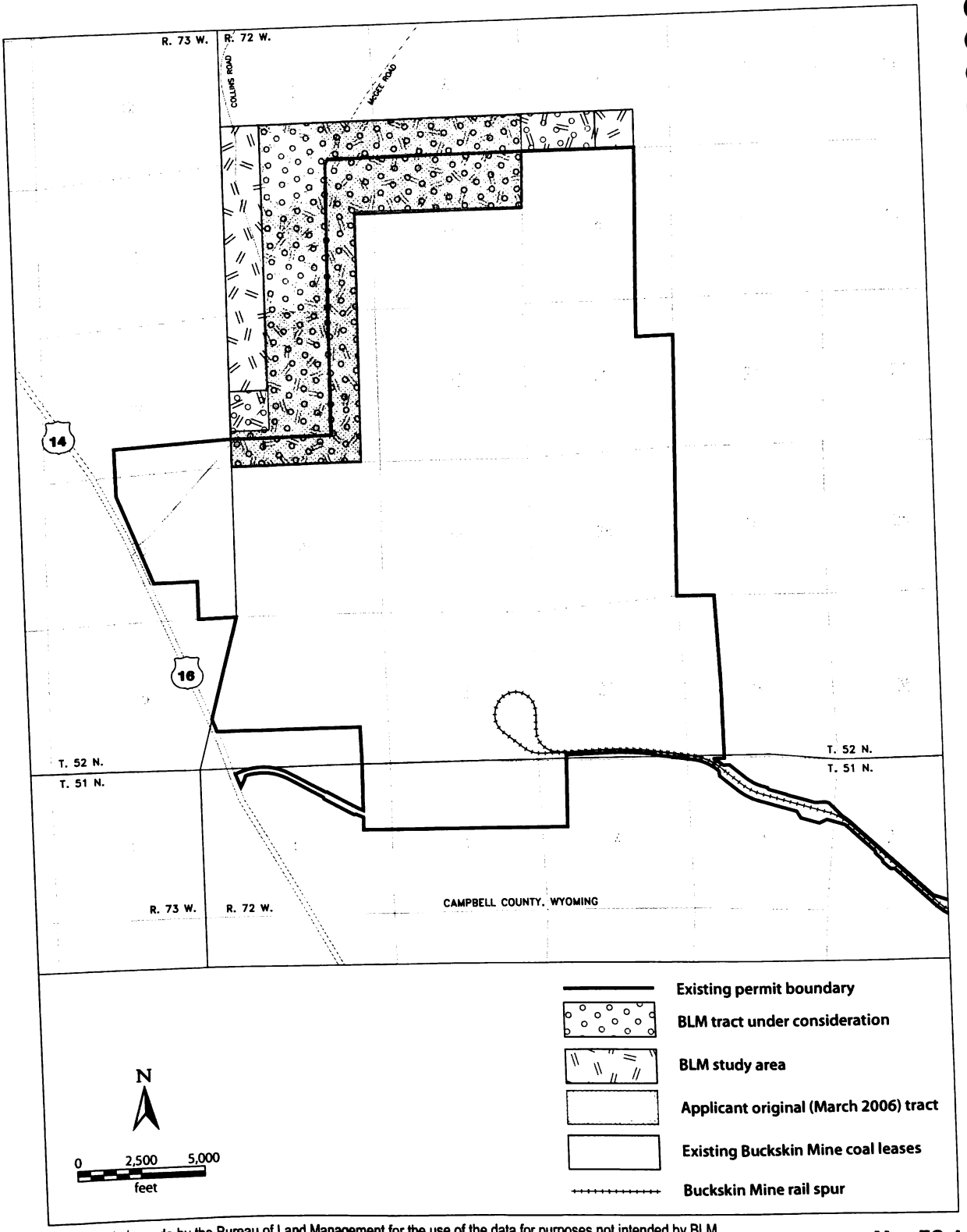
Clean Air Act requirements and increasing demand without potentially significant increases in power costs while new technologies are developed to improve efficiency and reduce emissions. Management of federal coal resources in the PRB also generates revenue—in the form of bonus, annual rental, and royalty payments—that is used to fund numerous infrastructure and social projects in Wyoming.

Proposed Action and Alternatives

The Proposed Action and two alternatives are analyzed in detail in this final EIS. No new life-of-mine facilities would be built under any of the alternatives; federal coal reserves would be mined as an extension of the existing mine.

- **Proposed Action**—Under the Proposed Action, the BLM would hold a competitive, sealed-bid sale and issue a lease for the federal coal reserves included in the proposed tract, which is a contiguous block of federal coal reserves adjacent to the existing Buckskin Mine permit area. The proposed tract includes approximately 419 acres (map ES-3) and 77.2 million tons of in-place coal reserves.
- **Alternative 1**—Under Alternative 1, the No Action Alternative, the coal lease application would be rejected and no new federal coal reserves would be offered for sale at this time. The existing leases at the Buckskin Mine would be developed according to the current approved mining plan. Rejection of the lease application would not preclude an application to lease a tract in that area in the future. The current coal leases at the mine include approximately 6,438 acres and 460.9 million tons of in-place coal reserves.
- **Alternative 2 (BLM Preferred Alternative)**— The BLM has identified Alternative 2 as its Preferred Alternative for the final EIS. Under that alternative, the BLM would hold a competitive, sealed-bid sale and issue a lease for the federal coal reserves included in an alternative tract configuration within the BLM study area (map ES-3), as determined by the BLM. The entire BLM study area (maximum potential lease area) includes up to approximately 1,883 acres and 269.7 million tons of in-place coal reserves. The BLM is considering an alternative tract configuration that is larger than both Kiewit's proposed tract and original (2006) tract, but smaller than the BLM study area (map ES-4). However, the BLM will not identify the final tract configuration until it issues the ROD for this leasing action.





No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map ES-4

BLM Tract under Consideration and Applicant Original (March 2006) Tract

Not all of the federal coal reserves in the proposed tract and BLM study area are considered mineable at present. Campbell County Road 23 (the Collins Road) and Campbell County Road 73 (the McGee Road) cross the BLM study area from its southern to northern boundaries; much of the western boundary of the proposed tract is adjacent to the Collins Road. The Surface Mining Control and Reclamation Act of 1977 (SMCRA) prohibits mining under a public road, in its right-of-way, or within 100 feet on either side of the right-of-way, as specified under unsuitability criterion 3 (43 CFR 3461.5[c][2][iii]). An exception to this prohibition is included in the SMCRA regulations at section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority allows the road to be relocated or closed after public notice, an opportunity for a public hearing, and a finding that the interests of the affected public and landowners will be protected.

Under the same unsuitability criterion, the land underlying the only occupied residence in the BLM study area is also considered unsuitable for mining. Surface disturbance at the residence and a 300-foot buffer around it would be prohibited unless Kiewit were to purchase the surface rights associated with the home and its buffer zone.

Kiewit does not currently plan to pursue efforts to close or relocate either county road, or acquire the surface rights to the land associated with the occupied residence; therefore, the company considers the lands around those features inaccessible and operationally limited. Nevertheless, the coal underlying these structures and their buffers is still considered for leasing because those reserves could be mined if the authorized agency determines that one or both roads can be closed or moved, or if Kiewit acquires the surface rights to the occupied residence. Including the coal underlying those features in the lease would also allow for maximum recovery of all the mineable coal adjacent to, but outside of, their respective buffer zones, even if no action is taken to seek an exception to unsuitability criterion 3. If a lease is issued for a tract, the BLM will attach a stipulation stating that no mining activity may be conducted in the portion of the lease underlying the county roads, their rights-of-way, and buffer zones and occupied residence and buffer zone unless approval is obtained from the appropriate authority to move or close the roads or acquire surface rights associated with the occupied residence, respectively.

In addition to existing mine operations, the BLM study area and immediate vicinity include agricultural lands (crops, hayfields, and pastures), several overhead electric power lines, gas (coal bed natural gas) pipelines and infrastructure, and two unoccupied residences. No permitted, operating conventional oil wells are located in the general area. Before any surface disturbance or additional mine-related activities could begin, support infrastructure such as power lines, gas pipelines, and flood- and sediment-control features would be built or relocated, as needed.

The analyses presented in this final EIS assume that Kiewit would be the successful bidder under both the Proposed Action and Alternative 2 (action alternatives). Kiewit would add the tract as an integral extension of existing operations at the Buckskin Mine. Facilities and infrastructure would be the same as those currently identified in the WDEQ Mine Permit 500 Term T7, approved May 22, 2006, and the *BLM Resource Recovery and Protection Plan*, approved

June 16, 2006. Kiewit would submit an application to the WDEQ to amend its existing surface mining permit and mining plan to incorporate the final tract configuration; that application would include detailed amendments to the current monitoring, reclamation, and mitigation plans to include a new lease area.

Table ES-1 describes projected coal production, surface disturbance, mine life, and projected federal and state revenues for the Buckskin Mine under each of the alternatives analyzed in this EIS. These figures are based on the current and projected average annual coal production rate of 25 million tons per year, and the assumption that coal reserves under the public roads and occupied residence would not be mined.

Table ES-1. Comparison of Coal Reserves, Lease and Permit Areas, Production, Mine Life, and Revenues

Item	Existing Buckskin Mine Permit Area	Additional Under		
		Alternative 1 (No Action)	Proposed Action	Alternative 2
In-Place Coal (as of 12-31-08)	460.9 mmt	0	77.2 mmt[a]	269.7 mmt[b]
Accessible Mineable Coal (as of 12-31-08)[c]	361.9 mmt	0	60.1 mmt[a]	166.3 mmt[b]
Recoverable Coal (as of 12-31-08)[d]	344.3 mmt	0	54.1 mmt[a]	149.7 mmt[b]
% Increase in Estimated Recoverable Coal (as of 12/31/08)[d]	—	0	15.7%	43.5%
Coal Lease Area	6,438.2 acres[e]	0	419.0 acres	1,883.1 acres
Permit Area	8,011.5 acres	0	478.0 acres	2,191.6 acres
Average Annual Post-2008 Coal Production	25 mmt	0	0	0
Remaining Life of Mine (Post-2008)[7]	14 years	0	2 years	up to 6 years
Average Number of Employees	350	0	0	0
Total Projected State and Local Revenues (Post-2008)[f]	$563.6 million	0	$90.6–$108.8 million	$250.2–$300.4 million
Total Projected Federal Revenues (Post-2008)[g]	$417.0 million	0	$69.2–$87.3 million	$191.0–$241.1 million

mmt = million tons

[a] Based on the entire proposed tract, including its overlap with the existing Buckskin Mine permit area.

[b] Based on the entire BLM study area, including its overlap with the existing Buckskin Mine permit area.

[c] Maximum estimate; does not include coal reserves that are inaccessible because of criteria 3 (i.e., reserves beneath the occupied residence and associated 300-foot buffer zone; or the public road rights-of-way [Collins and McGee roads], their associated 100-foot buffer zones, and other operationally limited lands between the two roads).

[d] Assumes a recovery rate of 95% for coal in the Canyon seam and a 90% for all other coal reserves; does not include coal left behind as support pillars and similar structures, or unavoidably lost through spillage and spontaneous natural fires during normal mining operations.

[e] Includes federal and state coal leases currently held by the Buckskin Mining Company.

[f] Revenues to the State of Wyoming and local governments include severance taxes; property and production taxes (ad valorem); sales and use taxes; and Wyoming's share of federal royalty payments, bonus bids, annual rental payments, and Abandoned Mine Land fees. State revenues are based on an assumed price of $7.85 per ton of "recoverable coal," federal royalty of 12.5% of the value less 51% federal share, plus $0.315 per ton for Abandoned Mine Land fees on assumed 25% state share, plus bonus payments of between $0.30 and $0.97 per ton of LBA leased coal per ton (based on average of six LBAs in 2004 and 2005) times the tonnage of recoverable coal times a 50% state share, plus $0.07 per ton estimated sales and use taxes, plus $0.33 per ton estimate for ad valorem taxes, plus $0.415 per ton in severance taxes. Only the sales and use taxes paid directly by the mine are considered (i.e., taxes generated by vendors and suppliers and by consumer expenditure supported directly and indirectly by the mine are not included. These figures could change based on the outcome of recent legislation that changed the percentage of distribution to states.

[g] Federal revenues are based on an assumed price of $7.85 per ton, federal royalty of 12.5% times 51% share, plus $0.315 per ton for Abandoned Mine Land fees times an assumed 75% federal share, plus black lung tax of $0.00261 per ton, plus bonus payments of between $0.30 and $0.97 per ton of LBA leased coal (based on the range of the six LBA sales in 2004 and 2005) times tonnage of recoverable coal minus a 50% federal share. These figures could change based on the outcome of recent legislation that changed the percentage of distribution to states.

Other alternatives that were considered but eliminated from further analysis in this EIS include:

- **Alternative 3**—Under Alternative 3, the BLM would hold a competitive, sealed-bid sale and issue a lease for a coal tract to a successful bidder other than the applicant for the purpose of developing a new stand-alone mine.
- **Alternative 4**—Under Alternative 4, the BLM would delay the sale of a new coal tract with the goal of increasing the public benefit should higher coal prices be in place at a later date

and/or to allow more complete recovery of the potential coal bed natural gas (CBNG) resource prior to mining.

The current economies of mining in the Powder River Federal Coal Region appear to make construction of a new mine economically unfeasible using estimated in-place coal reserves in the proposed tract or alternative tract configuration. The BLM currently estimates that a tract would need to include as much as 500 to 600 million tons of in-place coal to attract a buyer interested in opening a new mine in the Wyoming PRB. Neither the proposed tract (approximately 77 million tons) nor the BLM study area (about 270 million tons) includes sufficient in-place coal resources to justify the costs of opening a new mine. Given these limitations and other assumptions associated with a new mine start, such as the necessary annual production and competition for market share, Alternative 3 is not analyzed further in this EIS. Alternative 4 was not analyzed in detail because it would not produce substantially different impacts from the alternatives analyzed in this EIS; only the timing and possibly the economic return of the sale would differ.

Resources Addressed in this Environmental Impact Statement

The general analysis area represents the maximum surface area that could be disturbed by mining operations (coal extraction and support activities) analyzed in this EIS; it encompasses approximately 2,847.3 acres (map ES-5). The BLM requires that certain elements are analyzed when present in the affected environment. Maps ES-5 through ES-7 show the Proposed Action and two alternatives analyzed in this EIS for most resources, as well as the maximum potential surface disturbance within the general analysis area associated with each alternative.

Required elements present in the general analysis area and addressed in this EIS include:

- air quality (section 3.4);
- water quality (section 3.5);
- wetlands/riparian zones (section 3.7);
- invasive non-native species (section 3.9);
- threatened and endangered species (sections 3.9 and 3.10);
- cultural resources (section 3.12);
- hazardous or solid wastes (section 3.16);
- Native American religious concerns (section 3.17); and
- environmental justice (section 3.17).

The following additional resources also are present in the general analysis area and are addressed in this EIS:

- topography and physiography (section 3.2);
- geology, mineral, and paleontological resources (section 3.3);

- other water resources (section 3.5);
- alluvial valley floors (section 3.6);
- soils (section 3.8);
- vegetation (section 3.9);
- wildlife (section 3.10);
- land use and recreation (section 3.11);
- visual resources (section 3.13);
- noise (section 3.14);
- transportation resources (section 3.15); and
- socioeconomics (section 3.17).

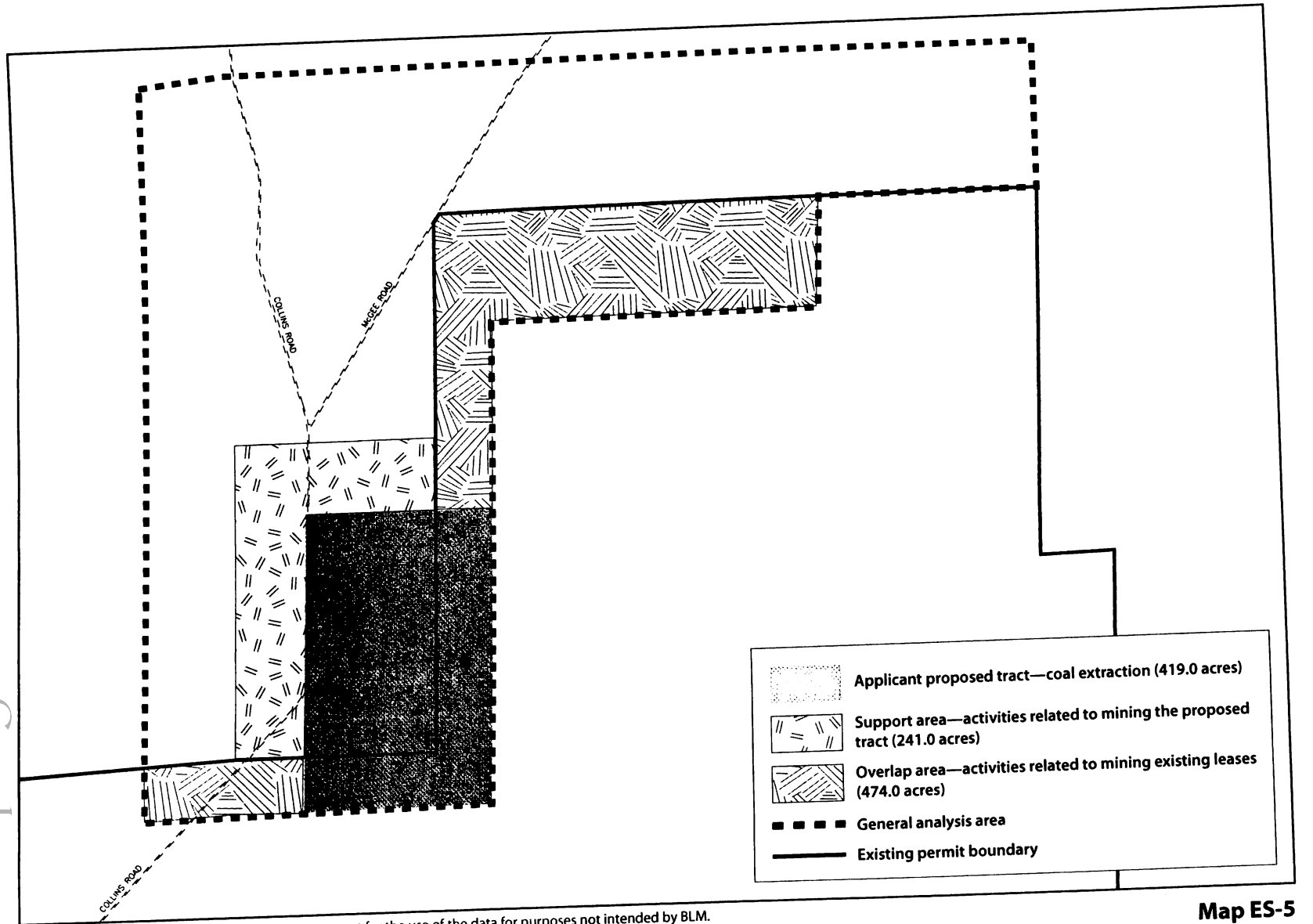
Five additional aspects considered in this chapter are:

- regulatory compliance;
- mitigation and monitoring;
- residual impacts;
- the relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity (3.18); and
- any irreversible and irretrievable commitments of resources that would be associated with the action alternatives (42 United States Code § 4332[C]) (3.19).

The following elements, which are required by the BLM when present in the affected environment, are not present in the general analysis area and are not addressed in this EIS:

- areas of critical environmental concern;
- prime or unique farmlands;
- floodplains;
- wild and scenic rivers; and
- wilderness.

Individual data reports were prepared for each resource; those reports include the information used to prepare the EIS. Copies of those reports can be viewed at the BLM Wyoming High Plains District Office in Casper, Wyoming.



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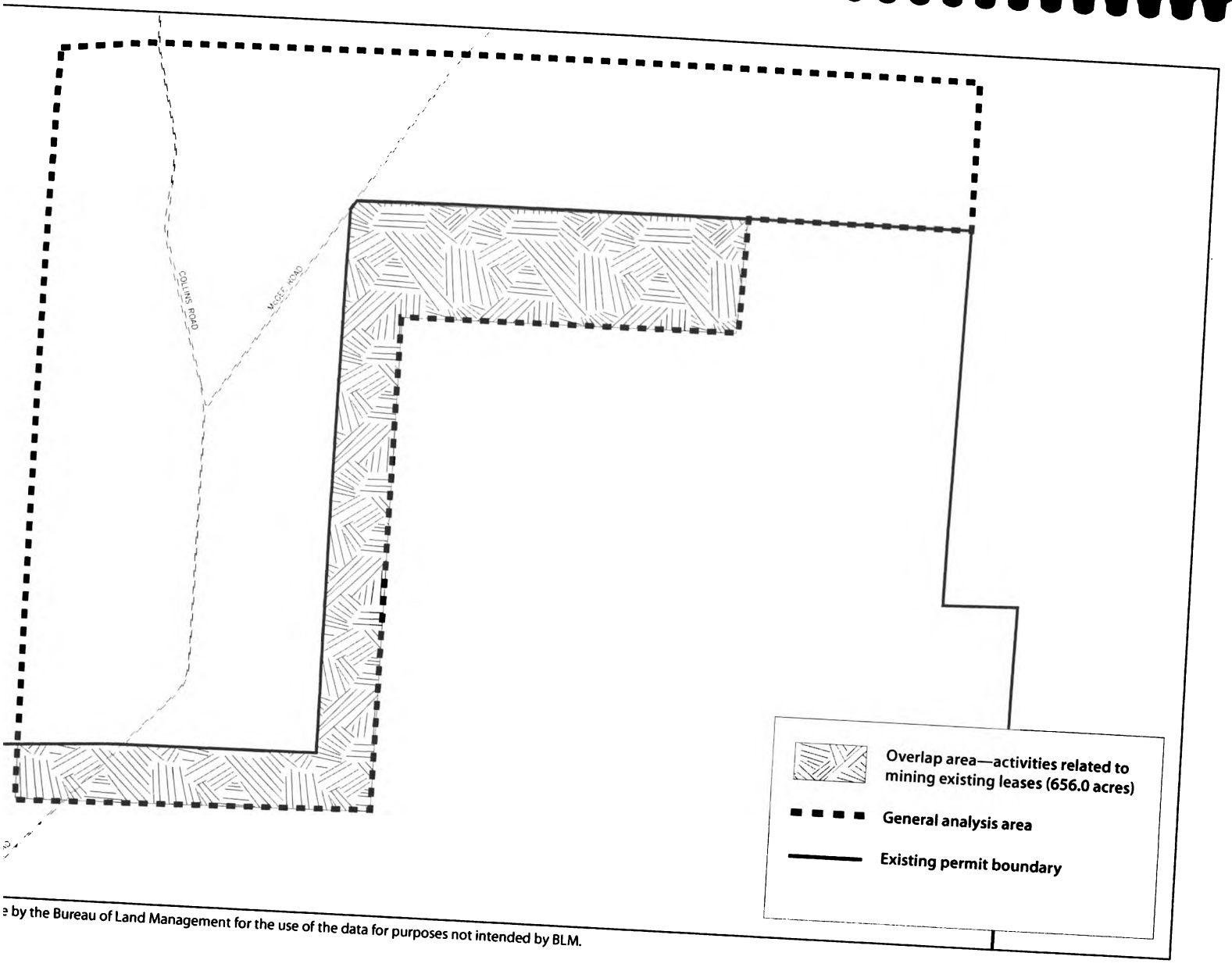
Map ES-5

Areas of Disturbance under the Proposed Action



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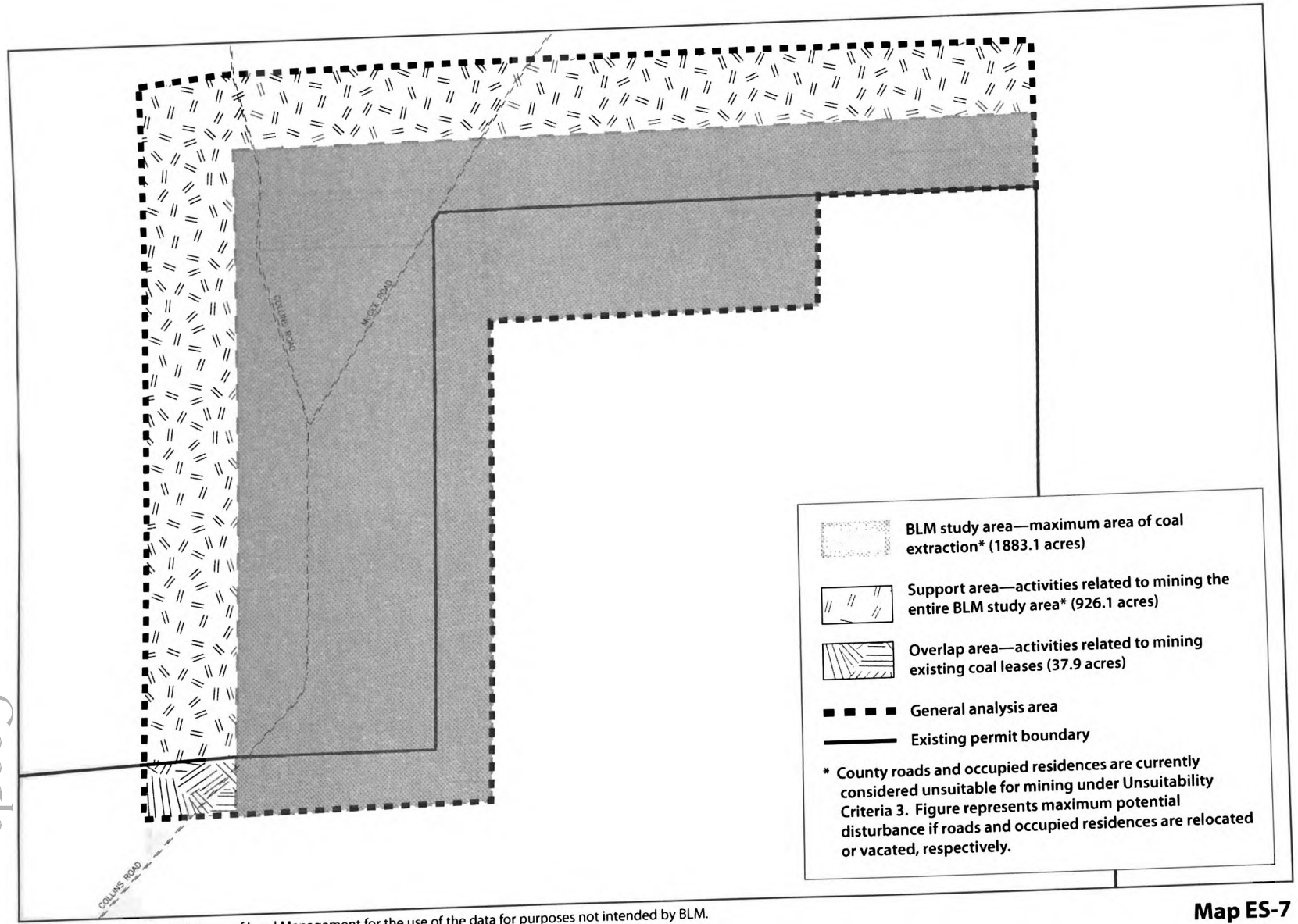
Map ES-6
Areas of Disturbance under Alternative 1 (No Action)



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Map ES-7
Areas of Disturbance under Alternative 2

Summary of General Setting and Environmental Consequences

The areas where mining and mine-related activities would occur under each alternative are provided below.

- Under the Proposed Action (map ES-5), coal extraction would occur in the entire proposed tract (approximately 419 acres). Activities related to mining[2] the proposed tract would occur in the support area, a 0.25-mile-wide area north and west of the proposed tract (approximately 241 acres); activities related to mining existing coal leases would continue in the remainder of the overlap area[3] (approximately 474 acres).
- Under Alternative 1 (map ES-6), activities related to mining existing coal leases would continue in the overlap area[3] (approximately 656 acres).
- Under Alternative 2 (map ES-7), coal extraction would occur in an alternative tract configuration within the BLM study area (up to approximately 1,883 acres). Activities related to mining an alternative tract configuration would occur in the support area, a 0.25-mile-wide area north and west of the alternative tract configuration (up to approximately 926 acres); activities related to mining existing coal leases would continue in the remainder of the overlap area[3] (approximately 38 acres).

General Setting

The general analysis area is adjacent to one of the northern-most operating mines in the PRB, in the part of the Northern Great Plains that includes most of northeastern Wyoming. The climate there is typical of a semi-arid, high plains environment with relatively large seasonal and diurnal variations in temperature. Precipitation occurs predominantly during the spring and fall, with approximately 10% in the form of snow. Surface wind speeds average 10.5 miles per hour throughout the year, with prevailing winds from the north-northwest and south-southeast, depending on the season.

The general analysis area is characterized by gently rolling uplands and relatively level agricultural fields; many hills are dissected by drainages that create moderate variations in local relief. Topographic elevations in the general analysis area range from approximately 4,080 feet above mean sea level along Hay Creek in the northern tier to about 4,380 feet above mean sea level in the southwestern portion of the area. The vegetation in the general analysis area consists of species common to eastern Wyoming and is consistent with vegetative communities in the adjacent Buckskin Mine permit area. The proposed tract is dominated (approximately 71%) by

[2] Mining and mine-related activities include, but are not limited to, topsoil stripping, stockpile storage, highwall back-sloping (including catch benches), highwall reduction after mining to match undisturbed topography, and construction of flood- and sediment-control structures. These activities are described in section 1.1.3.3

various upland grasslands. The general analysis area is comprised primarily of upland grasslands (approximately 40%) and agricultural lands (croplands and pastures, 31%).

Summary of Impacts

Impacts were identified in this EIS based on criteria set forth by the Council on Environmental Quality (40 CFR 1508.27), BLM NEPA Handbook H-1790-1, and the professional judgment of the specialists completing the analyses. Impacts can be beneficial or adverse, and can be a primary result (direct) of an action, a secondary result (indirect), or cumulative; cumulative impacts are discussed in chapter 4. They can be short-term (operational, persisting during active mining and reclamation); long-term (persisting through the time the reclamation bond is released—minimum of 10 years beyond active reclamation), or permanent. Impacts also vary in terms of significance. Significance can range from no impact or negligible impacts to substantial or significant impacts. Impacts can also be substantial during mining but reduced to no impact or negligible following completion of reclamation. In this EIS, impacts are considered to be adverse unless specifically identified as beneficial.

As described above, the general analysis area represents the maximum surface area that could be disturbed by mining activities analyzed in this EIS. Surface disturbance occurs outside of a coal lease area as a result of activities necessary to support mining including, but not limited to, topsoil stripping, stockpile storage, highwall back-sloping (including catch benches), highwall reduction after mining to match undisturbed topography, and construction of flood- and sediment-control structures.

Alternative 1 (No Action Alternative)

Under the No Action Alternative, the coal lease application would be rejected and no new federal coal reserves would be mined in the general analysis area. However, a decision to reject the coal lease application would not preclude an application to lease a tract in the general analysis area in the future. Under this alternative, impacts in the general analysis area would be limited to its overlap with the existing Buckskin Mine permit area (approximately 656 acres), and would consist of short-term surface disturbance from activities necessary to support mining on existing leases. In most cases, impacts under the No Action Alternative are the same or similar to those for the action alternatives, but would occur in the limited overlap area and would most often be short-term.

Proposed Action and Alternative 2

The following summary focuses on the expected impacts of the two action alternatives analyzed in this EIS.

Topography

Under both action alternatives, surface coal mining would have a moderate, permanent impact on the topography of the proposed tract or BLM study area through blasting, hauling, and stockpiling of overburden and interburden, and from coal extraction. Postmining topography

would be recontoured under either scenario to resemble the premining topography and the basic drainage system would be retained, but the reclaimed lands would be approximately 60 feet lower and somewhat gentler and more uniform in appearance.

These changes in the landscape would result in minor to moderate, long-term reductions in microhabitats and habitat diversity in the affected area. As discussed under the Wildlife Resources heading below, effects on wildlife would be minor to moderate, depending on the species, and long-term. Long-term beneficial impacts of the lower and flatter terrain would be reduced water runoff, which would increase infiltration rates for precipitation and reduce erosion, and may also increase vegetative productivity and potentially accelerate recharge of groundwater. These topographic changes would not conflict with regional land use, and the postmining topography would be designed to adequately support the anticipated future land use of the mined area.

Geology and Coal Resources

The Paleocene Fort Union Formation is the stratigraphic unit (i.e., geological layer) which contains the coal seams that would be mined under the action alternatives. This formation is divided into the Tongue River, Lebo, and Tullock members. The Anderson and Canyon coal seams of the Tongue River Member are targeted for mining in the BLM study area (the maximum extent of leasable coal in the general analysis area).

Under both action alternatives, removal of overburden, interburden, and coal reserves would have a significant, permanent impact on the geology and coal resources on up to 419 acres in the proposed tract and 1,883 acres in the BLM study area, with the area of impact depending on the final tract configuration. An average of about 250 feet of overburden and interburden, 30 feet of Anderson coal, and 70 feet of Canyon coal would be removed under either action alternative. Approximately 54 million tons of coal would be recovered from the proposed tract, and up to 149.7 million tons from the BLM study area.

Overburden removed during mining would be replaced with a relatively homogenous mixture of partially compacted rock and soil that would be significantly and permanently altered from the original distinct layers. Activities related to mining and reclamation would cause short-term surface disturbance in the support area for the final tract configuration.

Other Minerals

The Anderson and Canyon coal seams tapped for CBNG development are the same seams that are being mined at the Buckskin Mine. Wyoming Oil and Gas Conservation Commission records indicate that as of May 2008, 30 CBNG wells have been completed in the general analysis area. Half of those wells are producing and the rest have been shut in, are no longer producing, have been permanently abandoned, or have expired permits. Commission records indicate that no CBNG wells have been completed below the Anderson and Canyon seams within the general analysis area. No conventional oil and gas wells are located in the general analysis area. Additionally, no bentonite or uranium reserves have been identified in the general

analysis area. Clinker (known locally as scoria or red dog) breaks are absent from the proposed tract, but do occur on limited hillsides along the northern edge of the general analysis area.

Under the action alternatives, development of other minerals present in the general analysis area could not occur during mining, but could resume after mining. Surface coal mining would have permanent impacts on unrecovered oil and gas (conventional and CBNG) resources located in and above the mined coal seams. Resources that are not recovered prior to mining would be irretrievably lost when the coal is removed. Dewatering wells and active mining would combine with ongoing CBNG production to deplete the hydrostatic pressures and gas resources adjacent to mining areas a short time after mining would begin.

The action alternatives would have no impact on bentonite or uranium resources because they are not present in the general analysis area. Mining would remove or reduce limited clinker resources along the northern portion of the general analysis area, resulting in a permanent loss of those resources and a change in topographic relief.

Paleontological Resources

Two formations exposed on the surface of the general analysis area could contain paleontological resources: the Paleocene Fort Union Formation and the Paleocene and Eocene Wasatch Formation (Breckenridge 1974; Love and Christiansen 1985). Both of these sedimentary formations are known to yield vertebrate fossils in Wyoming (Estes 1975; Roehler 1991; Secord 1998; Robinson et al. 2004).

No significant or unique paleontological resources have been reported by the Buckskin Mine and none were recorded on the surface in the general analysis area during surveys conducted for the EIS. No specific mitigation was recommended for the action alternatives and no further paleontological work was recommended or required. Additional surveys for paleontological resources may be required if discoveries are made during mining operations. Undiscovered resources not exposed on the surface or detected during mining would be permanently lost.

Air Quality

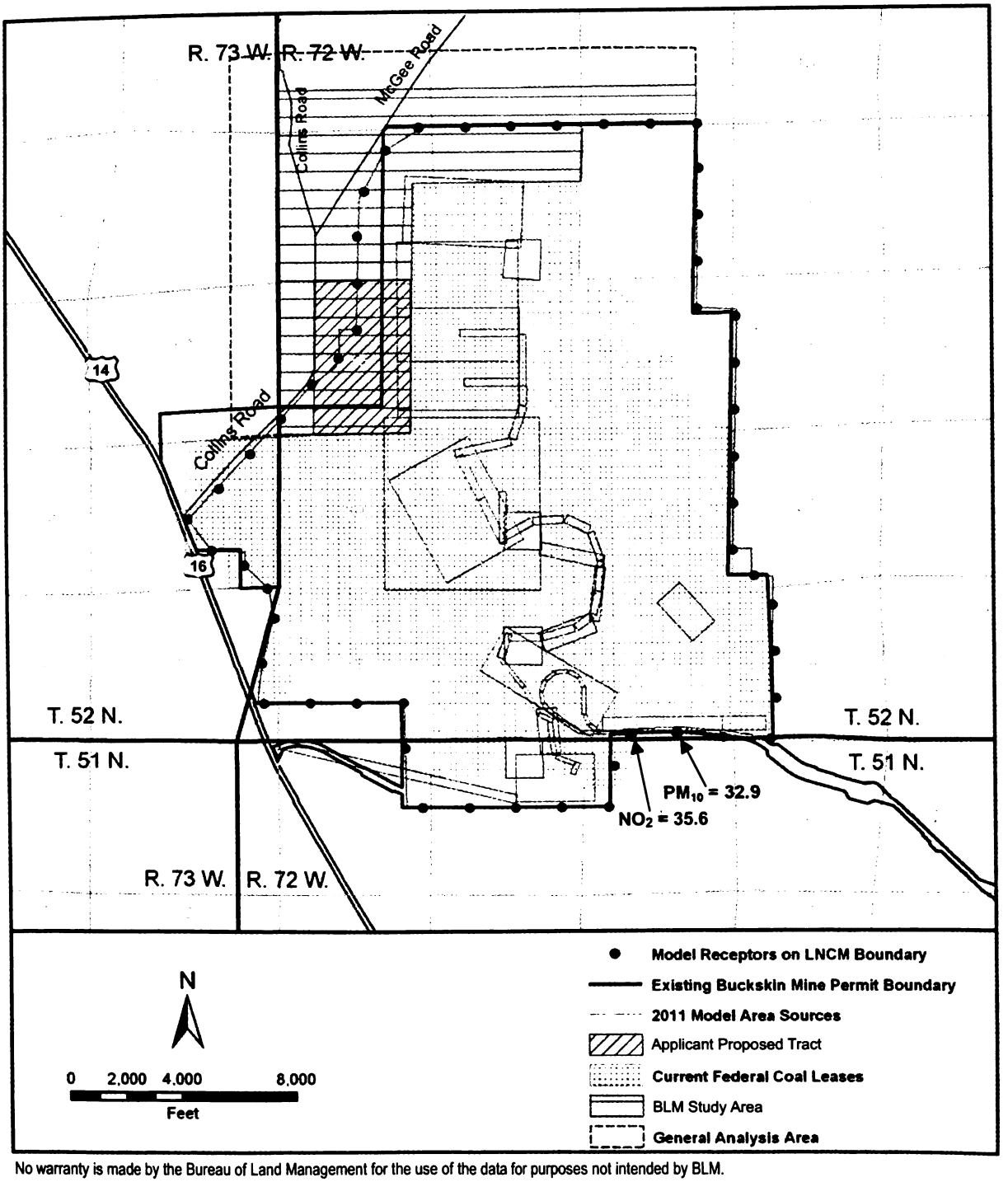
Particulate and gaseous emissions are the two primary types of air pollutants directly associated with surface coal mining in the PRB; both are associated with a variety of health and environmental impacts. In general, PM_{10} particulate matter is the major significant pollutant from coal mine point (stationary) and fugitive (non-point) sources; PM_{10} is coarse particulate with mean aerodynamic diameters less than 10 microns. The major sources of particulate emissions (solid particles and liquid droplets that can be suspended in air) at surface coal mines are fugitive dust and tailpipe emissions from large mining equipment. Activities such as blasting, excavating, loading, and hauling of overburden and coal, and wind erosion of disturbed land all produce fugitive dust. The most common point sources of particulate matter are associated with coal crushing, storage, and handling facilities.

Gases that contain nitrogen and oxygen in varying amounts are referred to as nitrogen oxides, or NO_x. These are the primary fugitive gaseous emissions produced during surface coal mining operations. Nitrogen oxides are generated from tailpipe emissions from mining equipment and other vehicle traffic inside the mine permit area. Blasting to remove overburden can result in emissions of nitrogen dioxide (NO_2), because of the incomplete combustion of explosives used in the blasting process. The Buckskin Mine does not use cast blasting to move overburden, which is the most common source of blasting emissions. No NO_x point sources occur at the Buckskin Mine.

Non-mining air pollutant emission sources are also present within the region, though most (i.e., fugitive dust and tailpipe and exhaust emissions) are similar to those at the coal mines. Nitrogen oxides and sulfur dioxide are also generated at power-plants. The closest coal-fired power plants are the Wyodak, WYGEN, and Neil Simpson plants, located about 15 miles southeast of the general analysis area. The Dry Fork Station, a 420-megawatt, coal-fired power plant currently under construction, is located approximately 10 miles southeast of the area. The Buckskin Mine does not provide coal to any power plants in the PRB, and does not dispose of coal combustion by-products from local power plants in its backfill.

The current (since December 2006) EPA 24-hour air quality standard for $PM_{2.5}$ (particulate matter with a mean aerodynamic diameter of 2.5 microns or less) is 35 micrograms per cubic meter ($\mu g/m^3$), a reduction from the previous level of 65 $\mu g/m^3$. The current annual $PM_{2.5}$ standard is 15 $\mu g/m^3$. PM_{10} particulates have been monitored at the PRB mines since 1989. The current National Ambient Air Quality Standard (NAAQS) for 24-hour standard for PM_{10} particulates is 150 $\mu g/m^3$. The former Wyoming annual PM_{10} standard of 50 $\mu g/m^3$ was revoked during the EPA revisions of air quality standards in 2006. The NAAQS for annual NO_2 is 100 $\mu g/m^3$. This gas is not currently regulated at surface coal mines by either national or state ambient air quality standards, though the WDEQ does require an assessment of annual NO_x impacts as part of an air quality permitting analysis for new surface coal mines and existing mine plan revisions.

Moderate, short-term impacts on air quality are currently present at the Buckskin Mine because of existing mine operations. Long-term modeling for the current Buckskin Mine permit did not forecast any exceedances of the annual PM_{10} particulate NAAQS at the permitted production rate of 42 million tons per year; Buckskin's current and anticipated average annual production rate is 25 million tons per year. Results from the Buckskin Mine 24-hour PM_{10} monitors surpassed the 24-hour national annual average standard (150 $\mu g/m^3$) on only three occasions since monitoring began in 1989. Two of the three exceedances were deemed an "exceptional event" associated with strong winds by the WDEQ. In all three cases, the Buckskin Mine followed all mitigation and documentation procedures as required by the Natural Events Action Policy, including submitting detailed reports of the exceedance and accompanying meteorological conditions to the WDEQ. The dispersion model for the lands necessary to conduct mining at Buckskin (map ES-8A) showed a maximum PM_{10} concentration of 32.9 $\mu g/m^3$ in 2011, one of the two projected "worst-case" years used for the model. Map ES-8B shows the same modeling information for 2012. Both maps also depict the area sources used to model fugitive emissions.



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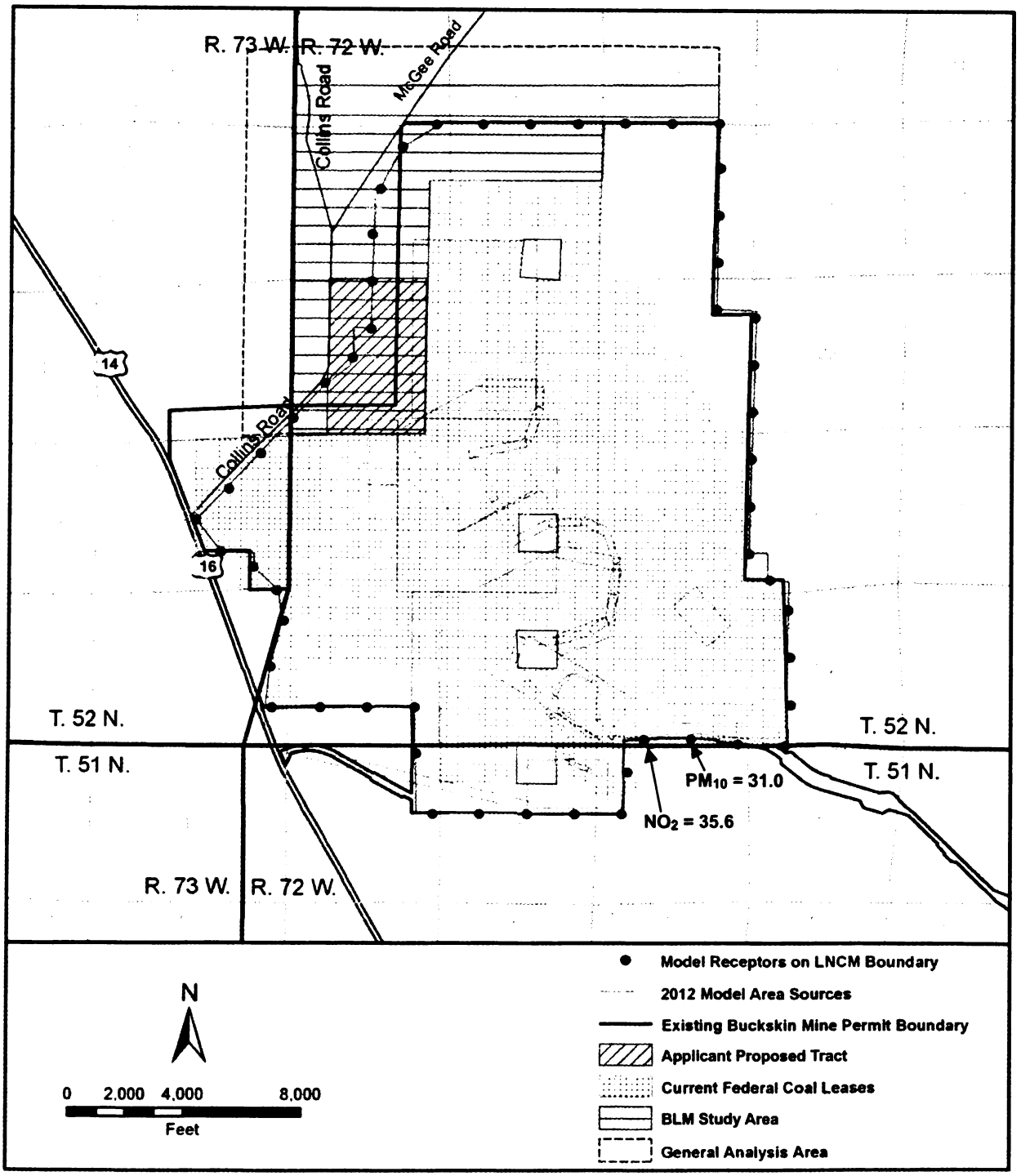
Map ES-8A

2011 Maximum Modeled PM_{10} and NO_2 Concentrations for Buckskin Mine Ambient Air Boundary



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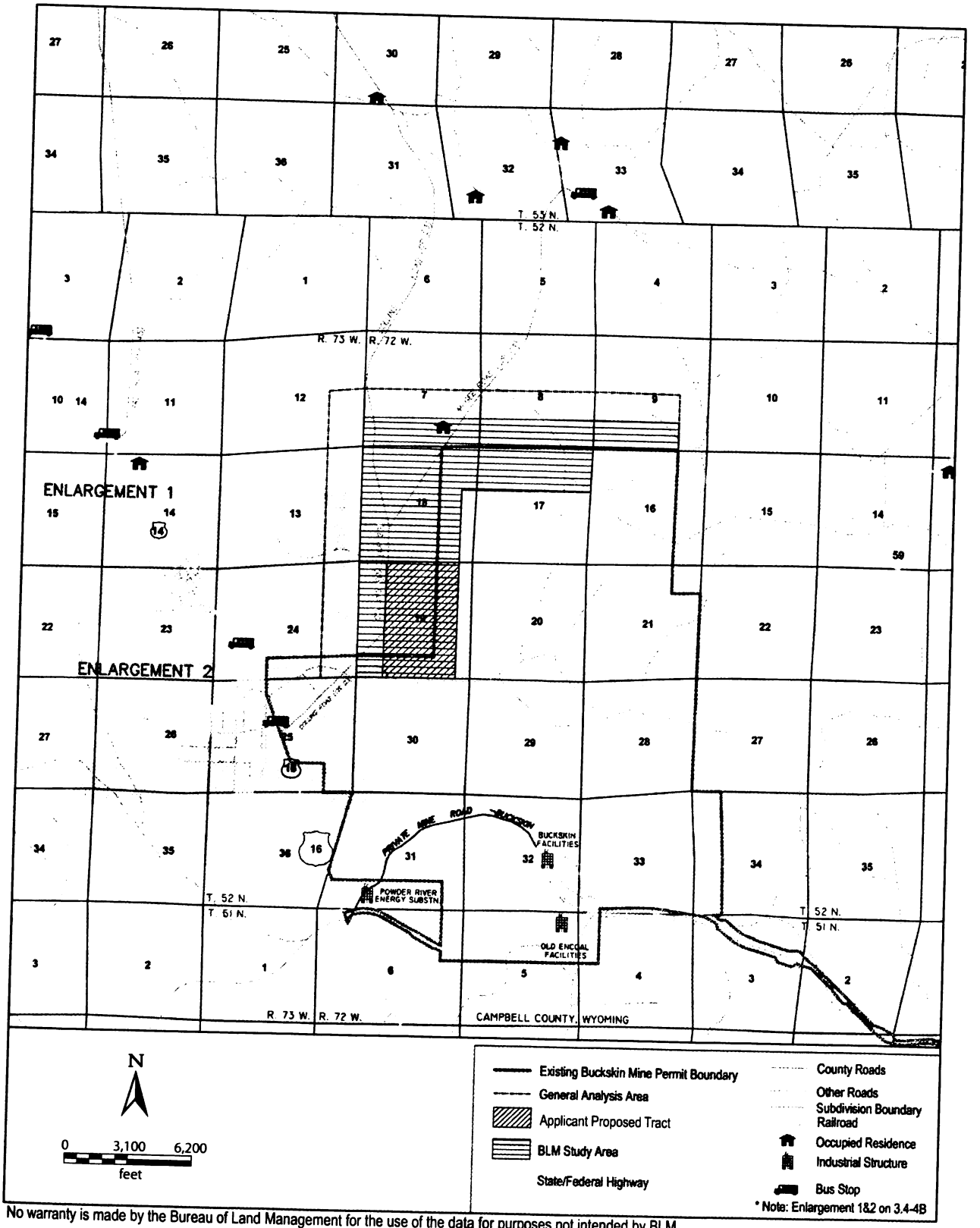
Map ES-8B

2012 Maximum Modeled PM_{10} and NO_2 Concentrations for Buckskin Mine Ambient Air Boundary

Adjacent landowners to the north of the Buckskin Mine have contacted and met with mine personnel on various occasions regarding their concerns about smoke from coal fires at the mine, NO_2, and dust. The landowners and mine representatives are actively working to resolve these issues. The landowners have indicated that they expressed similar concerns to the WDEQ. Nevertheless, the agency has not required the Buckskin Mine to implement any specific measures to control or limit public exposure to NO_2 from blasting, such as restrictions regarding blasting size, setbacks, or other parameters. Maximum annual NO_2 impacts of 1.6 $\mu g/m^3$ in 2011 and 1.8 $\mu g/m^3$ in 2012 were predicted during modeling for the Buckskin Mine; predictions for regional sources and background concentrations were 38.0 $\mu g/m^3$ and 37.8 $\mu g/m^3$ for these respective years. All four values were considerably lower than the annual NO_2 NAAQS of 100 $\mu g/m^3$.

Public exposure to emissions caused by surface mining operations is most likely to occur along public roads and highways that pass by or through the area of mining operations. One occupied dwelling is located within the general analysis area (map ES-9A and map ES-9B) that could also be affected. The residence is less than 0.25 mile north of the overlap area, west of the McGee Road and within the general analysis area; the home is approximately 1 mile north of the northern-most extent of disturbance that would be associated with the proposed tract. With one exception, all other occupied dwellings in the vicinity of the general analysis area are at least 0.5 mile from the general analysis area (map ES-9A and map ES-9B). Most homes are on the far side of ridges that provide visual and audio buffers from existing and future mine operations. Two school bus stops are located on U.S. Highway 14-16, approximately 0.5 mile west of the general analysis area (map ES-9A). Three other school bus stops are located more than 1.5 miles west and north of the area.

Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents as well as natural sources emit NO_x and volatile organic compounds that help form ozone. In March 2008, the EPA promulgated a revised NAAQS for ozone (*75 FR 11*). The ozone standard was lowered from 80 parts per billion to 75 parts per billion based on the fourth highest 8-hour average value per year at a site, averaged over three years. On January 6, 2010, the EPA proposed to strengthen the ozone standard by lowering the primary 8-hour standard to somewhere between 60 and 70 parts per billion (*75 FR 11*). The final standard is expected in mid-2011. The WDEQ does not require ozone monitoring at the Buckskin Mine; however, levels have been monitored at WDEQ operated and maintained ambient air quality monitor sites elsewhere in the PRB since 2001. The northern PRB is still considered an ozone attainment area, though ozone readings have occasionally exceeded the current standard of 75 parts per billion at the Thunder Basin air monitoring site in northern Campbell County. On June 2, 2010, the EPA issued a new 1-hour ambient standard for sulfur dioxide (SO_2) (EPA-HQ-OAR-2007-0352, RIN 2060-A048). The new standard is 75 parts per billion, applied to the three-year average of the fourth highest of the annual distribution of hourly averages. SO_2 monitors have been placed in the PRB explicitly to measure impacts from major sources; the nearest monitor is approximately 15 miles southeast of the Buckskin Mine. Neither site has violated the new 1-hour standard of 75 parts per billion.



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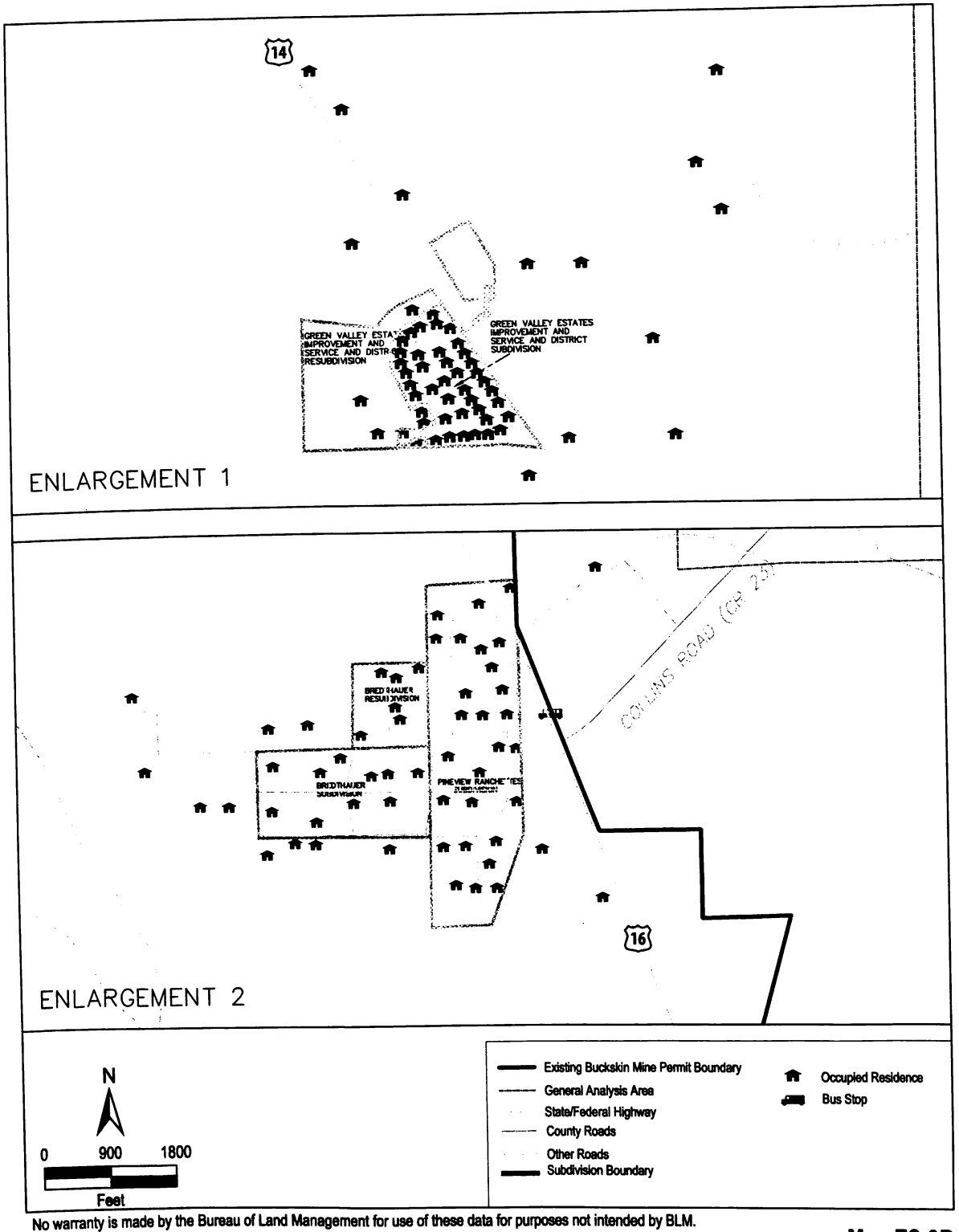
Map ES-9A

Roads, Highways, Occupied Dwellings, Businesses, and School Bus Stops in the Vicinity of the General Analysis Area



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Map ES-9B

Enlargement—Roads, Highways, Occupied Dwellings, Businesses, and School Bus Stops in the Vicinity of the General Analysis Area

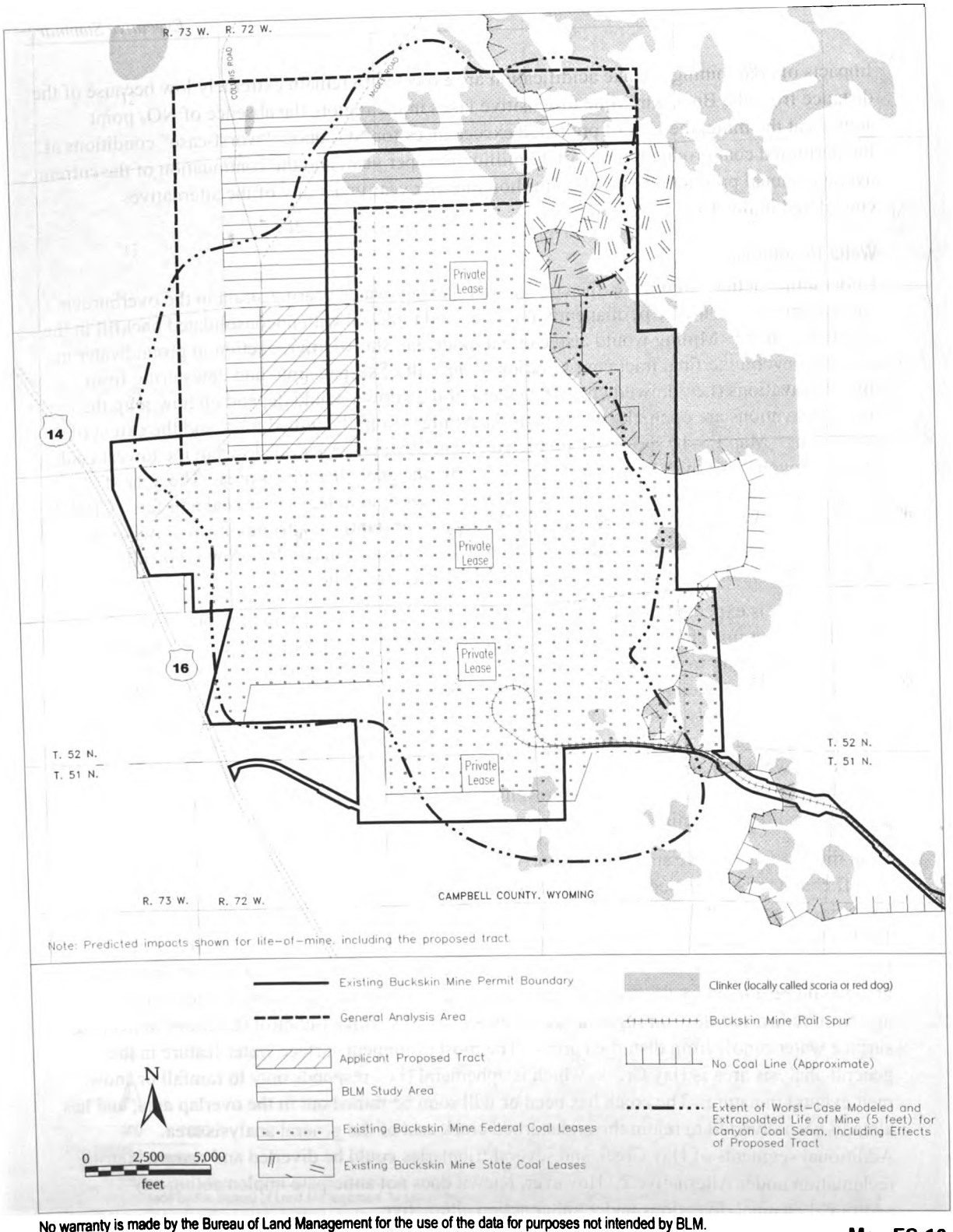
Impacts of coal mining on lake acidification are expected to remain extremely low because of the distance from the Buckskin Mine to sensitive lakes in the region, the absence of NO_x point sources at the mine, the lack of predicted exceedances for NO_x under "worst-case" conditions at the permitted coal production rate of 42 million tons per year, and the continuation of the current average annual production rate of 25 million tons per year under any of the alternatives considered in this EIS.

Water Resources

Under either action alternative, the coal aquifer and any water-bearing strata in the overburden and interburden would be permanently removed and replaced with unconsolidated backfill in the area to be mined. Mining would also cause a moderate, short-term reduction in groundwater in aquifers beyond the final tract configuration as a result of seepage into and dewatering from mine excavations (i.e., drawdown). The extent of drawdown would depend on how long the mine excavations are open, the distance of the aquifers from the mined tract, and the extent of dewatering. Map ES-10 shows the predicted extent of worst-case drawdown in the lowest coal seam (Canyon coal) over the life of the mine within the general analysis area. The area of drawdown in the overburden aquifers would be smaller than in that of the coal aquifers. CBNG development, where present, would continue to have substantial contributions to drawdown, especially in the coal seams. In the absence of CBNG development, drawdown typically is greatest near the mine, and decreases substantially away from the mine.

Groundwater is expected to rise to similar levels as observed prior to mining, but it would not have all of the same characteristics because of the more homogeneous nature of the backfill. Due to its proximity to the existing Buckskin Mine, groundwater quality in the backfill aquifer after mining is expected to be similar to that measured in wells completed in the existing backfill at the mine. It is likely that recharged groundwater would be adequate for postmining land uses such as water sources for livestock and wildlife. Mining would not disturb the aquifers below the coal. Two water supply wells from the underburden aquifer are currently used by the Buckskin Mine. Based on monitoring results to date, these wells currently could remain viable through the life of the mine.

Coal mining would have substantial, short-term effects on surface drainage systems and water runoff characteristics under either action alternative. Erosion and sediment discharge would likely increase in disturbed areas because of vegetation removal, but infiltration rates would likely improve after reclamation because of changes in soil structure and the presence of vegetation and more moderate topography to reduce runoff. Water flow and direction in that area would be altered by the removal and reconstruction of drainage channels prior to mining and from redirected flow through the use of erosion- and sediment-control structures to manage surface water runoff from disturbed areas. The most prominent surface water feature in the general analysis area is Hay Creek, which is ephemeral (i.e., responds only to rainfall or snow-melt events) in nature. The creek has been or will soon be mined out in the overlap area, and has already been diverted to rejoin the undisturbed creek east of the general analysis area. Additional segments of Hay Creek and several tributaries could be diverted and restored during reclamation under Alternative 2. However, Kiewit does not anticipate implementing any additional channel diversions under either action alternative.



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Map ES-10
Extent of Drawdown under Proposed Action

Both action alternatives would result in moderate, long-term impacts on groundwater rights for wells in coal or overburden aquifers until recharge. Effects would be similar for surface water rights. One surface water right on a disconnected drainage would be affected under the Proposed Action, while up to two surface water rights would be affected on disconnected drainages under Alternative 2.

Alluvial Valley Floors

The action alternatives considered in this EIS would not affect alluvial valley floors. Multiple investigations conducted within the general analysis area have concluded that the Hay Creek valley bottom is not an alluvial valley floor as defined by the WDEQ rules and regulations. No stream-laid deposits are present in the general analysis area. Runoff volume from 24-hour storm events in the vicinity of the Buckskin Mine is typically small relative to the cumulative storage capacity of reservoirs in the valley bottom and would not be sufficient to support any reliable flood irrigation practices.

Wetlands

Wetland inventories were based on U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping (USFWS 2007) and a reconnaissance-level field visit throughout the general analysis area. Based on the NWI maps, approximately 64.44 acres of wetlands have been identified in the general analysis area. Of these, 30.7 acres were considered potentially jurisdictional wetlands based on field observations; the remaining 33.74 acres were confirmed to be nonjurisdictional non-wetlands (e.g., borrow pits, old impoundments) or were not found to be present during the field visit. Only the U.S. Army Corps of Engineers has the authorization to determine which wetlands are jurisdictional or nonjurisdictional.

Since the 2007 NWI-based wetland determination was completed, a portion of the general analysis area was formally delineated by wetland biologists. The results of this study are currently being reviewed by the Corps and the issuance of an approved jurisdictional determination is pending.

The specific functions (e.g., agriculture, livestock, and wildlife) of each identified wetland will be determined during the delineation associated with the permitting process for the final tract configuration, should a lease be issued, and are, therefore, not addressed in detail as part of the EIS analysis.

Under the Proposed Action, surface mining in the proposed tract and related activities in the support area and overlap area (associated with existing coal leases) would have a moderate, permanent impact on four small, potentially jurisdictional NWI-inventoried wetlands (1.21 total acres). Under Alternative 2, surface mining in the BLM study area and related activities in the support area and overlap area could have a moderate, permanent impact on five small, potentially jurisdictional NWI-inventoried wetlands (1.89 total acres). The greatest single acreage of a potentially jurisdictional NWI-inventoried wetland is west of one or both county roads in the area considered operationally limited by Kiewit; Kiewit does not anticipate relocating either road to access coal reserves. All wetland functions at affected sites would be lost during mining and

support activities. Any impacts would be mitigated during reclamation by creating equivalent acreages of wetlands elsewhere in the Buckskin Mine permit area to ensure no net loss of wetland function in the general analysis area. No additional reaches of Hay Creek would be diverted under either action alternative.

Soil Resources

Five soil formation processes causing different soil types were described in the general analysis area. Soil types and depths in that area are similar to soils currently being salvaged and used for reclamation at the Buckskin Mine and other nearby mines in northern Campbell County.

Surface mining would have a moderate, long-term effect on soil resources in 1,134 acres under the Proposed Action and up to 2,847 acres under Alternative 2. Mining in the general analysis area would have a moderate, short- to long-term impact on the physical, biological, and chemical properties of stockpiled soils prior to reclamation. Following reclamation, the action alternatives would have a moderate, beneficial, long-term effect on replaced soils. Such soils would be more uniform in type, thickness, and texture, and would have a more uniform soil chemistry and soil nutrient distribution. Runoff would be decreased and infiltration rates would gradually return to premining levels. Sediment-control measures would be implemented where runoff does occur to preserve reclaimed materials. Average topsoil quality would be improved because soil material that is not suitable to support plant growth would not be salvaged for use in reclamation. The replaced soil would support a stable and productive vegetation community adequate in quality and quantity to support the planned postmining land uses (i.e., wildlife habitat and livestock grazing).

Vegetation Resources

Eight distinct vegetation communities and four additional categories were identified and mapped in the general analysis area. The proposed tract is dominated (71%) by a variety of common species of upland grasslands; the general analysis area is dominated (71%) by upland grasslands (approximately 40%, combined) and agricultural lands (crops, hay fields, and pastures; approximately 31%). Sagebrush comprises less than 11% of both the proposed tract and the general analysis area.

Under either action alternative, active mining and support activities would have a moderate, short-term impact on vegetation. Vegetation would be incrementally removed to accommodate mining. Effects would be greatest on upland grasslands and agricultural lands. Under the Proposed Action, approximately 126 non-contiguous acres of sagebrush would be affected in the proposed tract, support area, and remainder of the overlap area. Under Alternative 2, up to 302 non-contiguous acres of sagebrush would be affected in the BLM study area, support area, and remainder of the overlap area. Average patch size for sagebrush in those areas is 4.9 acres.

Impacts associated with the removal of vegetation could include increased soil erosion and differences between premining and postmining vegetative communities. Reclamation, including revegetation, will immediately follow as mining progresses through the area. Estimates of the time elapsed from topsoil stripping through reseeding of any given area range from two to

five years; that time-frame would be considerably longer for areas occupied by mine-related facilities and infrastructure.

Reestablished vegetation would be dominated by species mandated in the reclamation seed mixtures, which are approved by the WDEQ. The majority of these species would be native to the general analysis area. Erosion will be monitored to determine if corrective action is needed during establishment of vegetation. Controlled grazing will be used during revegetation as a management tool and to determine the suitability of the reclaimed land for postmining land uses. Any decrease in plant diversity would not seriously affect the potential productivity of the reclaimed areas, and the proposed postmining land use (wildlife habitat and rangeland) should be achieved even with the changes in vegetation composition and diversity.

Wildlife Resources

Both action alternatives would have a minor to moderate, short-term impact on most wildlife species present in the general analysis area, with longer effects to wildlife habitats. Impacts could include: injuries or mortalities causes by mine-related traffic; direct losses of less mobile wildlife species; restrictions on wildlife movement created by fences, spoil piles and pits; displacement of wildlife from existing habitat in areas of active mining (including abandonment of nests or nesting and breeding habitat for birds); loss of nesting and foraging habitat; increased competition between animals in areas adjacent to mining operations; and increased noise, dust, and human presence. Habitat disturbance would be incremental through the general analysis area, with reclamation progressing as new disturbance occurs.

The Hay Creek II general analysis area is not included in or within several miles of either a state sage-grouse core breeding area or connectivity area, as defined by the Governor of Wyoming's Sage-Grouse Implementation Team (Office of the Governor of Wyoming 2008), or BLM sage-grouse focus area. No greater sage-grouse leks would be physically affected by either action alternative. The nearest sage-grouse lek (Hay Creek) is within the existing permit area approximately 0.5 mile to the southeast of the general analysis area and, thus, is already subject to disturbance from previously permitted activities. The McGee sage-grouse lek is on private surface approximately 1.25 miles north of the general analysis area. That site is on the far side of multiple ridges that provide a visual and audio buffer, and it is not likely to be affected by mine operations. The Daly sage-grouse lek is approximately 1.75 miles southwest of the general analysis area. That lek has been inactive for the last 17 consecutive years, though two adult males were seen approximately 1,000 feet from the lek on one occasion in 2002; the Daly lek has been classified as abandoned by the WGFD (2006). Sage-grouse were last observed at the Hay Creek lek in 2001 and the McGee lek in 2004; both are considered occupied by the WGFD (2006).

Two occupied sharp-tailed grouse leks occur within the general analysis area. The McGee II lek is in the overlap area with the current permit area and the McGee III lek is immediately north of the overlap area (Alternative 2). Due to their locations, those leks have been or would be disturbed by previously permitted mining of existing leases. The McGee I sharp-tailed grouse lek is approximately 0.25 mile north of the general analysis area. It would not be in view of the

general analysis area because of the ridgeline that separates the two sites, but it could be affected by noise from within the general analysis area. The Stickel lek is approximately 0.75 mile southeast of the general analysis area and within the existing permit area; this site has been or would be disturbed by previously permitted activities on existing leases. Sharp-tailed grouse were last recorded at the McGee II lek in 2004 and the McGee III lek in 2005. The McGee I lek was last active in 2001, and the Stickel lek in 2002.

As described previously, the prevalence of upland grasslands and the limited presence of surface water reduce the area's value to sagebrush obligates such as the sage-grouse. No grouse nests or broods for either species have been recorded in the general analysis area during targeted surveys or incidental to surveys for other species. No sage-grouse have been observed during winter, though site visits occur less often at that time of year. No sharp-tailed grouse have ever been observed on the proposed tract during any season, though flocks of as many as a dozen birds have infrequently been recorded in the general analysis area, feeding in fallow agricultural fields and perched in the tree shelterbelt near the junction of the Collins and McGee roads in winter. No sharp-tailed grouse have been seen in those locations since at least 2003.

The general analysis area does not include any unique or crucial big game habitat, and no elk or white-tailed deer are present there. No bald eagle nests or winter roosts have ever been documented in the general analysis area or surrounding lands; sightings of this species in the vicinity of the general analysis area have averaged less than one bird per winter over the last 26 years (1984–2009).

Little (less than 1% of the total area) aquatic habitat is present in the general analysis area, so few aquatic species would be lost during mining operations. Indirect impacts are longer-term and include alterations in topography and vegetative cover following mining and reclamation, which may decrease wildlife carrying capacity and habitat diversity. Because the general analysis area is dominated (71% combined) by upland grassland communities and agricultural lands, the establishment of reclaimed grassland communities after mining has been completed would represent similar or somewhat improved habitats for most wildlife species compared to those in the premining landscape.

No mountain plovers have ever been documented in the vicinity of the general analysis area during that period. Additionally, typical suitable habitat (short and sparse vegetation) for this species is not present in the area. None of the 18 migratory bird species of management concern for Wyoming coal mines that have historically been observed in the vicinity are regularly seen in the general analysis area. The upland grasslands and agricultural lands that dominate the area lack the specific characteristics (shrubs, wetlands, prairie dog colonies, or shorter, less dense grasses) typically associated with the species of greatest concern.

Up to three intact raptor nests could be affected in the general analysis area. Due to their respective locations and histories, only one of the three intact nests is likely to be affected by future mining operations under either action alternative. That nest is in a tree grove in the overlap area and, thus, is already subject to disturbance from previously permitted mine operations. All appropriate mitigation measures will be taken for that nest, in keeping with the

current USFWS-approved monitoring and mitigation plan; the plan would be updated prior to the permitting process and before any new surface associated with either alternative is disturbed.

In the long term, following reclamation, wildlife habitat diversity may be somewhat reduced because of gentler topography, less diverse vegetative cover, and reduction in sagebrush density. However, sagebrush comprises less than 11% of the general analysis area, so impacts on sagebrush-obligates would be reduced. Efforts have been initiated in recent years by mining companies to increase the diversity of postmine topography and to increase the amount of sagebrush in the reclamation, as appropriate.

Threatened and Endangered Species

The action alternatives discussed in this EIS will have no effect on threatened and endangered plant and animal species. Two federally listed plant species occur in Campbell County: the Ute ladies'-tresses (threatened) and blow-out penstemon (endangered). Areas of suitable habitat for the Ute ladies'-tresses within the general analysis area were surveyed during the appropriate survey window in August 2004 and annually from 2006 through 2009; no individuals were located. Surveys conducted for potential blowout penstemon habitat in the general analysis area in 2008 and 2009 confirmed that no suitable habitat for this species is present in the area. In addition, the general analysis area is not located within the documented historical range of the blowout penstemon in Wyoming, which is located approximately 170 miles northwest of the known Nebraska sites and approximately 225 miles northeast of the Wyoming occurrences.

On March 5, 2010, the USFWS issued a determination that listing the greater sage-grouse under the Endangered Species Act was "warranted, but precluded" by other higher priorities. Although the sage-grouse continues to be managed by the WGFD, its current status as a candidate species under the Endangered Species Act gives further impetus to ongoing annual monitoring efforts. On May 11, 2011, after a thorough review of all available scientific and commercial information, the USFWS determined that the mountain plover is not threatened or endangered throughout all or a significant portion of its range, including the Hay Creek II general analysis area and the rest of Campbell County, Wyoming (76 FR 92). The black-footed ferret has been removed from the list of threatened and endangered species for Campbell County, but remains on the national list for such species. The ferret is a nocturnal mammal that depends almost entirely upon the prairie dog for its survival. No black-footed ferrets have ever been documented at the Buckskin Mine or in the surrounding region, and no black-tailed prairie dog colonies (potential ferret habitat) are present within the general analysis area.

Land Use and Recreation

The entire surface of the existing Buckskin Mine permit area and general analysis area is privately owned by individuals or companies. All of the coal reserves in the proposed tract and BLM study area are federally owned, whereas the remaining subsurface minerals (i.e., oil and gas reserves) are under a mixture of private and federal ownership. Wildlife habitat and livestock grazing are the primary present and historical land uses in the general analysis area. Secondary land uses include pastureland (ranching), dryland cropland, transportation, and CBNG development. Coal mining at the Buckskin Mine is and has been the dominant land use to the

east and south of the general analysis area since the mid 1980s. No conventional oil and gas wells are located in the general analysis area.

Under both action alternatives, active mining would have a moderate, short-term impact on most other land uses, with a long-term impact on some wildlife habitats. Grazing uses of the general analysis area would be more limited in disturbance areas during mining, though grazing is used as a management tool in reclaimed areas. Oil and gas development would be curtailed and CBNG that is not recovered prior to mining would be irretrievably lost as the coal is removed. Due to the lack of public lands, opportunities for recreational use and public grazing would not be affected. Existing coal and transportation activities, infrastructure, and facilities would remain in the area; coal production and transportation would continue at their current rates. Kiewit does not anticipate relocating any roads or securing occupied residences to access new federal coal reserves. Livestock and wildlife use is expected to increase once mined areas are fully reclaimed.

Cultural Resources

The entire general analysis area has been reviewed for previous cultural surveys through a files search and inventoried for cultural resources at a Class III level in the field. Of the 14 sites identified in that area, 6 are prehistoric and 8 are historic (Newberry 2008). Historic site categories documented in the general analysis area fall under the context of rural settlement. Specifically, the historic sites in the general analysis area are associated with homesteading and stock-raising circa the 1910s to the 1940s. All prehistoric and historic sites are determined not eligible for inclusion in the National Register of Historic Places. No further protection is afforded these sites and no further work is required.

No sites of Native American religious or cultural importance have been identified in the general analysis area. Appropriate action must be taken to address concerns related to any cultural or Native American sites identified at a later date.

Visual Resources

Mining would affect landscapes classified by the BLM as visual resource management Class IV; the overall natural scenic quality of that class rating is considered relatively low. Impacts of coal mining on visibility in the general analysis area would be minor and short-term. Mining activities would be visible from U.S. Highway 14-16 and two county roads (the Collins and McGee roads), though the extent and duration of visibility would vary under each action alternative. No unique visual resources have been identified in or near the general analysis area, and the landscape character would not be significantly changed following reclamation. Current mining activities (blasting procedures and sizes, coal haul rates and distances, dust suppression, etc.) at the Buckskin Mine would not change if the proposed tract or an alternative configuration is leased. Current best available control technology measures for particulates that could contribute to impaired visibility would continue to be employed.

Noise

One occupied residence is located within the general analysis area, less than 0.25 mile north of the overlap area. This residence is in direct line-of-sight of the current mine pit and associated support activities. Mine-related noise under the action alternatives would have a minor to substantial, short-term impact on this residence, depending on the final tract configuration. Most occupied dwellings are located in one of three housing developments west of the existing permit area and on the far side of Highway 14-16. Those residences are currently closer to the existing permit area than they would be to new mining under either action alternative. The high rolling terrain between most residences and the general analysis area provides a visual and audio buffer from current and future mine operations. Additionally, the increase in noise levels would not be considered a significant noise impact because the rate of mining would not change and the western limit of expansion of the mine would be constrained because of the required setbacks at the Collins Road and U.S. Highway 14-16.

Noise levels in wildlife habitat adjacent to the expansion area might increase, but anecdotal observations indicate wildlife can adapt to mine noise, especially since similar mining operations have been conducted in the area for many years. No increase in average daily railroad traffic or railroad noise would occur under any of the alternatives analyzed.

Transportation

Transportation facilities in and near the general analysis area include a federal highway, a state highway, two gravel county roads, various unimproved local and access roads; the improved Buckskin Mine access road; the Buckskin Mine rail spur; oil and gas pipelines; electric corridors; and associated rights-of-way.

Under the Proposed Action, surface coal mining in the proposed tract could impact one public roadway, three overhead power lines, four existing oil and gas pipelines, and one potential new oil and gas easement; impacts would be minor to moderate, and short-term. Under Alternative 2, mining could have similar impacts on two public roadways, eight overhead power lines, six existing oil and gas pipelines, and one potential new oil and gas easement. Most of the power lines in the vicinity are associated with on-going mine operations. No rail lines would be affected under either action alternative. Temporary surface disturbance from mine support activities (e.g., topsoil stripping, soil stockpiling) in the combined buffer area could affect one additional power line and three additional pipelines.

Existing road and rail infrastructure would remain in place, though the rate of road and rail use is not expected to increase during that period. Two public roads (the Collins and McGee roads) are located within the general analysis area. Lands within 100 feet of the outside edge of the right-of-way of a public road are considered unsuitable for mining; however, they could be included in the final tract configuration to allow for maximum recovery of all the minable coal adjacent to the 100-foot buffer zones. Active pipelines and utility/power lines would have to be relocated in accordance with previous agreements, or agreements would have to be negotiated for their removal or relocation.

Hazardous and Solid Waste

Potential sources of hazardous or solid waste could include spilled, leaked, or dumped substances, petroleum products, and solid waste associated with coal and oil and gas exploration, oil and gas development, utility line installation and maintenance, or agricultural activities. No such hazardous or solid wastes are known to be present in the general analysis area.

Impacts associated with hazardous waste would be negligible and short-term. Hazardous and solid wastes generated in the course of mining the proposed tract would be similar to those currently being created by existing mining operations,. Wastes generated by mining the proposed tract would be handled in accordance with the existing regulations using the procedures currently in use, and in accordance with WDEQ-approved waste disposal plans at the Buckskin Mine

Socioeconomics

Both action alternatives would have negligible, beneficial, short-term impacts on local employment. The Buckskin Mine anticipates hiring a few additional employees to meet existing staffing needs, but no new hires are expected to occur as a result of a new coal leasing action. Impacts on federal and state revenues would be substantial and beneficial under both action alternatives. The potential additional federal revenue from the general analysis area would range from approximately $69 to $241 million, depending on the alternative selected and the bonus price when the coal is leased. The potential additional revenue to the state of Wyoming from the general analysis area would range from $91 to $300 million, depending on the alternative selected, the bonus price when the coal is leased, and the selling price of the coal. Because average annual coal production rates would not increase, no new employees would be hired as a direct result of a leasing action and therefore no new impacts on the local housing market or increased demands on the existing community facilities or services in the county would occur though existing demands on infrastructure could be extended by up to six years.

Environmental Justice

Economic and demographic data indicate that neither minority populations nor people living at or below the poverty level comprise a "meaningfully greater increment" of the total population in Gillette or Campbell County than they do in the state as a whole. Also, the Native American population is smaller than in the state as a whole and no known Native American sacred sites are present in or near the general analysis area.

Greenhouse Gas Emissions

The annual equivalent carbon dioxide (CO_2e) emissions at the Buckskin Mine are not expected to increase under either action alternative. The maximum annual coal production would not be affected; average strip ratios and haul distances would be substantially equivalent to those already encountered at the mine. Conversely, projected CO_2e emissions over the life of the mine would increase under either action alternative. Although annual average production is not expected to increase, the additional federal coal reserves would extend the mine life by approximately two years under the Proposed Action and up to six years under Alternative 2,

which would also extend the period for associated CO_2e emissions. Methane emissions from Wyoming's coal mines in 2010 are projected to be 2.3 million metric tons of CO_2e (Center for Climate Strategies 2007), of which the Buckskin Mine's 2008 methane emissions represent 3.4%.

Carbon Sequestration

Carbon sequestration, the process of carbon capture, separation, and storage or reuse, is being researched as a means to stabilize and reduce concentrations of carbon dioxide (CO_2), a greenhouse gas. Direct options for carbon sequestration would involve means to capture CO_2 at the source (e.g., power plant) before it enters the atmosphere coupled with "value-added" sequestration (e.g., use of captured CO_2 in enhanced oil recovery operations). Indirect sequestration would involve means of integrating fossil fuel production and use with terrestrial sequestration and enhanced ocean storage of carbon (U.S. Department of Energy 2007). The PRB has geologic formations and producing oil and gas reservoirs that are potential target candidates for both enhanced oil recovery and/or deep geologic sequestration. The current limiting factor is the lack of pipeline infrastructure and economic feasibility for CO_2 transmission and use. No geologic carbon sequestration projects currently exist or are currently planned in the PRB at this time.

Mitigation

The Buckskin Mine's currently approved mining permit includes extensive baseline information, ongoing monitoring information and commitments, and mitigation measures that are required by the SMCRA and Wyoming State Law. Compliance, mitigation, and monitoring measures that are required by regulation are considered to be part of the Proposed Action and Alternative 2 considered in this EIS. These regulatory requirements, mitigation measures, and monitoring commitments are in place for the No Action Alternative as part of the currently approved mining and reclamation plan for the mine and would be updated prior to the permitting process that would be required to mine the final tract configuration.

If impacts are identified during the leasing process that are not mitigated by existing required mitigation measures, the BLM can include additional mitigation measures, in the form of stipulations on a new lease, within the limits of its regulatory authority. Any special stipulations identified by the BLM where additional or increased monitoring measures are recommended to be added to the BLM leases are included in appendix D of the EIS.

Cumulative Impacts

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

Since decertification of the Powder River Federal Coal Region in 1990, 22 federal coal leases containing more than 6.1 billion tons of federal coal have been issued following competitive sealed-bid sales. Three exchanges of federal coal in the Wyoming portion of the Powder River Federal Coal Region have also been completed. Eleven additional coal lease applications, including the Hay Creek II coal lease application, are currently pending. The pending LBA applications contain over 3.3 billion tons of coal.

Currently, the BLM is completing a regional technical study, called the PRB Coal Review, to help evaluate the cumulative impacts of coal and other mineral development in the PRB. The study evaluates current conditions as of a baseline year (2002, 2003, or 2004) and projects development levels and potential associated cumulative impacts related to coal and coal-related development, oil and gas and related development, and other development through 2020. Due to variables associated with future coal production, two projected coal production scenarios (representing an upper and a lower production level) were developed. The projected development levels are based on projected demand and coal market forecasts and include production at the Buckskin Mine during the baseline year and projected production for 2010, 2015, and 2020.

The Wyoming portion of the PRB is the primary focus of the PRB Coal Review, but the Montana portion of the PRB is included in some studies. Results for those PRB Coal Review studies that have been completed are summarized in chapter 4.0 of the EIS. The remaining studies will be incorporated into the final report as they become available.

Cumulative impacts vary by resource, with potential impacts on air quality, groundwater quantity, wildlife habitat, and socioeconomics generally representing the greatest concerns.

The original PRB Coal Review air quality study documented the modeled air quality impact of existing operations during a baseline year, 2002, and of projected development activities in 2010. The BLM updated the model in 2008 and conducted the cumulative air quality impact analysis using a revised baseline year of 2004 with development levels projected for year 2015; that analysis was included in the draft EIS. After the draft EIS was issued, modeling of cumulative air quality effects for 2020 was completed; data and analyses for both model years are reflected in this final EIS. The EPA guideline CALPUFF model system version 5.8 (Scire et al. 1999a) was used for the modeling analysis. The revised baseline year emissions inventory was developed using 2004 actual emissions data or emissions estimates and has incorporated the recent analyses of emissions in Wyoming and Montana, which were not available when the 2010 modeling study was done. The impacts for the baseline year (2004) and for 2015 and 2020 lower and upper coal production scenarios were directly modeled.

The PRB Coal Review generally considers existing regional air quality conditions in the targeted study areas to be very good. There are limited air pollution emissions sources (few industrial facilities, including the surface coal mines, and few residential emissions in relatively small communities and isolated ranches) and good atmospheric dispersion conditions. The available data show that the region complies with the ambient air quality standards for NO_2 and SO_2. There have been no monitored exceedances of the annual PM_{10} standard in the Wyoming PRB. Table ES-2 presents the maximum modeled impacts on ambient air quality at the near-field

receptors in Wyoming and Montana. Results shown represent the maximum impact at any point in each receptor group; data are provided for the baseline year (2004) analysis and for both coal production scenarios for 2015 and 2020. Peak impacts occur at isolated receptors and are likely due to unique source-receptor relationships. The model results should not be construed as predicting an actual exceedance of any standard, but are at best indicators of potential impacts.

Table ES-3 lists provides a detailed listing of visibility impacts for all analyzed Class I and sensitive Class II areas. For the upper and lower coal production scenarios, it shows the number of additional days that the projected impacts were greater than 1.0 deciview (10% change in light extinction) for each site in each modeled year.

The PRB Coal Review provides an assessment of the cumulative impact on surface and groundwater resources associated with future projected levels of coal mining, coal mine dewatering, CBNG groundwater withdrawal and surface disposal, and coal mine and conventional oil and gas surface disposal of groundwater. Updated Coal Review studies describe the baseline year (2002) ground and surface water resource conditions in the study area, which includes the Hay Creek II area and the rest of Campbell County. The reports present potential future cumulative groundwater impacts in the area of CBNG development and coal mine expansion in the eastern PRB. They also provide a cumulative impact assessment of modeled changes in surface water quality as a result of CBNG, conventional oil and gas, and surface coal mining development projected for 2010, 2015, and 2020 (base year of 2003) in the eastern PRB within approximately 25 miles of the coal mines. A stream channel stability analysis was also conducted to evaluate the potential effects to stream channels because of projected CBNG production water discharge.

A number of modeling analyses have previously been conducted to help predict the impacts of surface coal mining on groundwater resources in the PRB. In addition, each mine must monitor groundwater levels in the coal and underlying and overlying aquifers and assess the probable hydrologic consequences of mining as part of the mine permitting process. Extending the life of the Buckskin Mine by issuing a new lease would result in additional water being withdrawn from the subcoal Fort Union Formation, but no new subcoal water supply wells would be required. The additional water withdrawal would not be expected to extend the area of water level drawdown over a substantially larger area because of the discontinuous nature of the sands in the Tullock Member and the fact that drawdown and yield reach equilibrium in a well because of recharge effects. Because of the distances separating subcoal Fort Union Formation wells used for mine water supply, these wells have not experienced interference and are not likely to in the future.

Table ES-2. Projected Maximum Potential Near-Field Impacts (μg/m³)

Pollutant	Averaging Time	Base Year (2004) Impacts	2015 Lower Coal Development Scenario Impacts	2015 Upper Coal Development Scenario Impacts	2020 Lower Coal Development Scenario Impacts	2020 Upper Coal Development Scenario Impacts	National AAQS	Wyoming AAQS	Montana AAQS	PSD Class II Increments
Wyoming Near-Field										
NO_2	Annual	31.3	46.7	47.4	30.5	30.6	100	100	—[a]	25
SO_2	Annual	15.3	16.2	16.2	16.4	16.5	80	60	—	20
	24-hour	112.3	119.6	119.6	143.3	143.3	365	260	—	91
	3-hour	462.0	814.1	814.1	936.7	936.7	1,300	1,300	—	512
$PM_{2.5}$	Annual	13.4	**18.7**	**21.4**	**16.3**	**16.3**	15	15	—	—
	24-hour	**87.6**	**179.5**	**179.5**	**218.4**	**218.4**	35	35	—	—
PM_{10}	Annual	38.4	**53.5**	**61.0**	46.6	46.6	—	50[b]	—	17
	24-hour	**250.4**	**512.8**	**512.9**	**624.1**	**624.3**	150	150	—	30
Montana Near-Field										
NO_2	Annual	3.3	6.5	6.5	2.5	2.6	100	—	100	25
	1-hour	**409.0**	**826.3**	**826.4**	**440.1**	**442.7**	188.1	—	564	—
SO_2	Annual	1.6	1.7	1.7	3.0	3.1	80	—	80	20
	24-hour	16.1	16.5	16.6	24.7	27.1	365	—	365	91
	3-hour	65.0	66.5	66.5	138.9	138.9	1,300	—	1,300	512
	1-hour	162.9	166.6	166.6	237.0	259.1	—	—	1,300	—
$PM_{2.5}$	Annual	1.0	1.8	1.9	0.9	0.9	15	—	15	—
	24-hour	10.2	15.4	20.6	10.2	10.2	35	—	35	—
PM_{10}	Annual	2.8	5.2	5.3	2.5	2.6	—	—	50	17
	24-hour	29.1	44.0	58.5	29.3	29.3	150	—	150	30

μg/m³ = microgram per cubic meter; AAQS = Ambient Air Quality Standards; PSD = prevention of significant deterioration; NO = nitrogen oxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter measuring 10 microns or less in diameter; $PM_{2.5}$ = particulate matter measuring 2.5 microns or less in diameter

[a] No standard or increment.

[b] The EPA has revoked the NAAQS annual PM_{10} standard of 50 μg/m³, but that standard is still effective for Wyoming until it enters into rulemaking to revise the state AAQS.

Bold values indicate projected exceedance of national and/or state ambient air quality standards.

Source: 2009 update to the Task 3A Report (BLM 2009c).

Table ES-3. Modeled Change in Visibility Impacts at Class I and Sensitive Class II Areas

Location	Base Year (2004)	Coal Development Scenario			
		2015 Lower	2015 Upper	2020 Lower	2020 Upper
	No. of Days >10% Change in Visibility	Change in No. of Days >10% in visibility			
Class I Areas[a]					
Badlands National Park	218	26	26	44	44
Bob Marshall Wilderness Area	8	0	0	0	0
Bridger Wilderness Area	144	2	2	5	5
Fitzpatrick Wilderness Area	91	2	2	6	6
Fort Peck Indian Reservation	105	10	10	20	21
Gates of the Mountain Wilderness Area	55	0	0	4	4
Grand Teton National Park	70	2	2	6	6
North Absaroka Wilderness Area	61	3	3	8	8
North Cheyenne Indian Reservation	243	32	47	59	60
Red Rock Lakes	42	2	2	3	3
Scapegoat Wilderness Area	27	1	1	2	2
Teton Wilderness Area	57	4	4	8	8
Theodore Roosevelt National Park	178	5	9	24	24
UL Bend Wilderness Area	77	8	10	18	18
Washakie Wilderness Area	83	5	5	8	8
Wind Cave National Park	262	18	19	28	31
Yellowstone National Park	84	2	2	5	5

Location	Base Year (2004)	Coal Development Scenario			
		2015 Lower	2015 Upper	2020 Lower	2020 Upper
	No. of Days >10% Change in Visibility	Change in No. of Days >10% in visibility			
Sensitive Class II Areas[b]					
Absaroka Beartooth Wilderness Area	101	2	3	10	10
Agate Fossil Beds National Monument	251	20	20	26	26
Big Horn Canyon National Rec. Area	331	1	3	1	1
Black Elk Wilderness Area	236	34	36	47	47
Cloud Peak Wilderness Area	126	18	18	29	30
Crow Indian Reservation	360	4	4	3	3
Devils Tower National Monument	274	25	25	31	32
Fort Belknap Indian Reservation	66	6	7	14	15
Fort Laramie National Historic Site	260	10	10	15	16
Jedediah Smith Wilderness Area	79	1	1	3	5
Jewel Cave National Monument	261	19	21	36	37
Lee Metcalf Wilderness Area	97	2	2	2	2
Mount Naomi Wilderness Area	51	1	1	1	1
Mount Rushmore National Monument	222	36	36	49	52
Popo Agie Wilderness Area	139	4	4	6	6
Soldier Creek Wilderness Area	268	18	18	19	19
Wellsville Mountain Wilderness Area	130	10	10	17	17
Wind River Indian Reservation	217	2	5	9	10

[a] Pristine attainment area.
[b] Certain federal assets with Class II status for which air quality and/or visibility are valued resources.
Source: 2009 update to the Task 3A Report (BLM 2009c).

Projected cumulative surface water impacts primarily include the impacts of CBNG production water discharge to ephemeral drainages and the surface disturbance and subsequent reclamation of drainages that result from coal mine expansion. Future coal mining in the PRB could remove intermittent or ephemeral streams and stockponds in various watershed. Coal mine permits provide for removal of first- through fourth-order drainages. During reclamation, third- and fourth-order drainages must be restored; first- and second-order drainages often are not replaced (Martin et al. 1988). Coal-mining-related surface water would be discharged into intermittent and ephemeral streams. Based on current trends, it is assumed that most, if not all, of the coal-mine-produced water would be consumed during operation. As discussed in section 3.5.2.2, changes in surface runoff would occur as a result of the destruction and reconstruction of drainage channels as mining progresses. Sediment control structures would be used to manage discharges of surface water from the mine permit areas. State and federal regulations require treatment of surface runoff from mined lands to meet effluent standards. Monitoring data from the mines indicate that water from the backfill will generally be acceptable for premining uses (primarily livestock watering). Modeling and monitoring indicate that the groundwater drawdown impacts of coal mining and CBNG development are overlapping.

The updated PRB Coal Review studies discuss potential cumulative impacts on wildlife from projected development activities in that study area. The area of habitat disturbance and reclamation for 2003 and 2007and the projected cumulative areas of disturbance and reclamation for 2010, 2015, and 2020 are shown in tables 4-2 and 4-3. As discussed above, impacts on wildlife and fisheries can be classified as no impact (threatened and endangered species), short-term, and long-term. Potential short-term impacts arise from habitat disturbance associated with a project's development and operation (e.g., coal mines, CBNG wells) and would cease upon project completion and successful reclamation in a given area. Potential long-term impacts consist of long-term or permanent changes to habitats and the wildlife populations that depend on those habitats, irrespective of reclamation success, and habitat disturbance related to longer term projects (e.g., power plant facilities, rail lines). Habitat fragmentation can result from activities such as roads, well pads, mines, pipelines, and overhead electrical power lines, as well as increased noise, elevated human presence, dispersal of noxious and invasive weed species, and dust from unpaved road traffic. These effects result in overall changes in habitat quality, habitat loss, increased animal displacement, reductions in local wildlife populations, and changes in species composition. However, the severity of these effects on terrestrial wildlife would depend on factors such as sensitivity of the species, seasonal use, type and timing of project activities, and physical parameters (e.g., topography, cover, forage, and climate). Potential cumulative effects on fisheries from of development activities would be closely related to impacts on ground and surface water resources.

The PRB Coal Review used the REMI Policy Insight regional economic model to project cumulative employment and population levels and associated impacts in the PRB for the upper and lower coal production scenarios in 2010, 2015, and 2020. Table ES-4 presents the recent and projected population levels for the counties included in the PRB Coal Review socioeconomic analysis. The Hay Creek II LBA would have no impact on local or regional populations.

Table ES-4. Recent and Projected PRB Population

Year	Campbell County	Converse County	Crook County	Johnson County	Sheridan County	Weston County	Six County PRB Total
Census							
2000	33,698	12,104	5,895	7,108	26,606	6,642	92,053
2003[a]	36,381	12,326	5,971	7,530	27,116	6,665	95,989
2006[a]	38,934	12,866	6,255	8,014	27,673	6,762	100,504
2009[a]	43,967	13,578	6,653	8,531	29,163	7,009	108,901
Projected Lower Coal Production Scenario							
2010	45,925	13,103	6,542	8,389	28,459	7,108	109,526
2015	48,905	13,671	6,759	8,867	30,016	7,174	115,392
2020	50,995	14,193	6,989	9,326	31,467	7,208	120,178
Projected Upper Coal Production Scenario							
2010	47,662	13,160	6,570	8,424	28,579	7,137	111,532
2015	51,558	13,763	6,802	8,924	30,214	7,219	118,480
2020	54,943	14,313	7,045	9,403	31,733	7,266	124,703

[a] Projected by U.S. Census Bureau based on 2000 data.

Source: U.S. Census Bureau (2006a) and 2005 Task 3C Report (BLM 2005a).

1.0 INTRODUCTION

This environmental impact statement (EIS[1]) presents the analysis of impacts that would result from leasing federal coal reserves in the Hay Creek II lease by application (LBA) tract (Proposed Action). The EIS also analyzes alternatives to the Proposed Action.

This EIS was prepared in accordance with the National Environmental Policy Act (NEPA) and associated rules and guidelines. As administrator of the federal coal leasing program for surface and underground mining under the Mineral Leasing Act of 1920, as amended, the U.S. Bureau of Land Management (BLM) is considered the lead agency, under NEPA, responsible for the preparation of this EIS.

The BLM will use this impact analysis to make a decision regarding unleased federal coal reserves within and adjacent to the Buckskin Mine, an operating surface coal mine in the Powder River Basin (PRB) of northeast Wyoming. Issuing a federal coal lease does not authorize mining to occur, but is the first step in that process. The lease merely grants the lessee the exclusive right to pursue a mining permit for the coal tract subject to the terms of the lease, the mining permit itself, and all applicable state and federal laws. Permits to mine are issued by authorized federal and/or state agencies only after a lease has been secured and all appropriate agencies have reviewed and approved an extensive permit application. That application document provides information describing a wide range of baseline resources, as well as detailed mining, mitigation, and reclamation plans.

A minimum of 12 other state and federal agencies will also use this EIS analysis to make decisions related to leasing and mining the federal coal reserves in the proposed tract. The Office of Surface Mining Reclamation and Enforcement (OSM) and all divisions of the Wyoming Department of Environmental Quality (WDEQ) are cooperating agencies on this EIS. The OSM is primarily responsible for administering federal programs that regulate surface coal mining operations. If a tract is leased, that agency will use this EIS to determine whether approval of the mining plan for the tract complies with the Mineral Leasing Act of 1920. The WDEQ has entered into a cooperative agreement with the Secretary of the Interior to regulate surface coal mining operations on federal and nonfederal lands in Wyoming. During the permitting process, the WDEQ incorporates input from numerous internal departments as well as various state and federal agencies.

The WDEQ has also been delegated authority by the U.S. Environmental Protection Agency (EPA) to implement federal programs of the Clean Air Act (CAA) Amendments of 1990. The WDEQ implements the Wyoming Air Quality Standards and Regulations and CAA Amendments through various air permitting programs. Input from the Wyoming Game and Fish Department (WGFD) and the U.S. Fish and Wildlife Service (USFWS) is used to ensure that adequate monitoring, mitigation, and reclamation plans are in place for wildlife and fisheries

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

resources and habitats. The Wyoming Department of Transportation may review the EIS if road construction or relocation projects are considered in the analyses.

The public has several opportunities to comment throughout the coal leasing and permitting processes. For leasing decisions, the public may participate during the initial scoping of the project, as well as through public hearings and comment periods that are held for the draft and final EIS. Once the coal is leased by the BLM, the public has several additional opportunities to comment on the actual permit to mine issued by the WDEQ and OSM, including the original permitting process, every major change to the permit after its initial approval, and every five years during the standard permit renewal process for surface coal mines in Wyoming.

1.1 Background

The Buckskin Mine is one of several mines currently operating in the PRB, where the coal seams are notably thick and the overburden is relatively thin throughout the region. The mine is operated by the Buckskin Mining Company, a directly held subsidiary of Kiewit Mining Properties, Inc. (Kiewit).

1.1.1 Buckskin Mine Application

On March 24, 2006, Kiewit filed an application to lease the federal coal reserves included in the Hay Creek II maintenance LBA tract under the regulations at 43 Code of Federal Regulations (CFR) 3425 (Leasing on Application). A maintenance coal tract is an area of federal coal reserves that is adjacent to an existing coal lease and can be excavated by an active coal mine. The maintenance tract is located approximately 12 miles north of Gillette, Campbell County, Wyoming (map 1-1), northwest of and immediately adjacent to existing federal coal leases for the Buckskin Mine. The tract would maintain current average levels of production rather than expand mine operations.

Kiewit initially applied for the Hay Creek II maintenance tract to extend the life of existing operations at the Buckskin Mine. Since submitting its original application in 2006 (see "applicant original (March 2006) tract" on map 1-2), Kiewit modified its lease application due to changing needs (see "applicant proposed tract" on map 1-2). The applicant proposed tract (proposed tract) from November 28, 2008, was analyzed in the draft EIS. That proposed tract was the bare minimum needed to provide a technically and economically feasible method for the Buckskin Mine to pass through a geologic irregularity known as the Sand Channel Basin to reach low-sulfur compliance coal in the existing Spring Draw lease (WYW-78634).

Unforeseen LBA processing delays caused Buckskin to lose the mechanical advantage needed to mine past the sand channel. Consequently, on September 3, 2010, Kiewit requested that the BLM consider a tract configuration under Alternative 2 (see chapter 2) based on the original tract configuration applied for in March 2006. Buckskin no longer needs the coal immediately and, therefore, prefers to pursue a tract with a longer-term application for its existing mining operations.

For the purposes of this analysis, the proposed tract remains unchanged from the draft EIS. Because both the BLM study area and the general analysis area, as defined in chapter 3, encompassed all configurations of Kiewit's proposed tract, the analyses performed for the draft EIS are still valid for the final EIS. Therefore, because the tract as originally applied for has been fully covered, it will not be analyzed separately in this document.

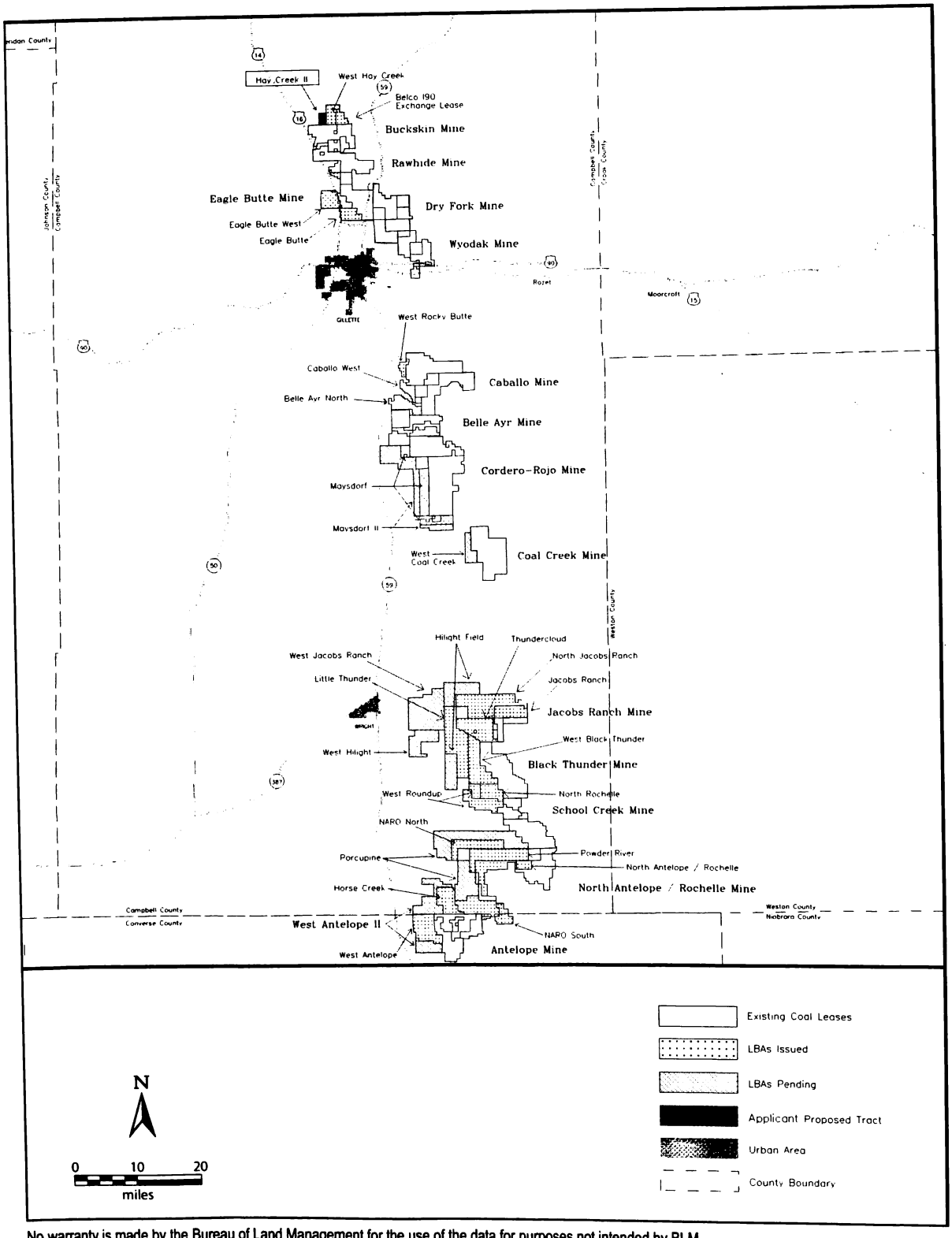
The BLM, Wyoming State Office, Division of Minerals and Lands, has reviewed Kiewit's application for the proposed tract. That office determined that the lease application meets the regulatory requirements for an LBA. Map 1-1 shows the proposed tract, other currently pending LBA tracts, and the existing federal leases, including previously leased LBA tracts, in the PRB. The proposed tract was assigned BLM case file number WYW-172684. The 2006 application was subsequently modified in May and November of 2008. The November tract modification is evaluated in this EIS.

1.1.2 BLM Coal Leasing Process

The proposed tract is located in the Powder River Federal Coal Region. That area was decertified[2] for coal leasing in 1990 at the recommendation of the Powder River Regional Coal Team (PRRCT). The recommendation was made in response to the declining coal market and reduced interest in leasing sufficient quantities of coal to warrant a regional sale process during the previous eight years. The PRRCT is an independent advisory board of the BLM established to provide advice and guidance regarding the federal coal management program in the PRB. The board is comprised of various federal and state agencies, with voting members limited to the BLM and the state governments of Wyoming and Montana. In a region that is decertified, the BLM can consider leasing individual coal tracts by application to continue or extend the life of an existing mine under the rules of 43 CFR 3425. As part of the 1990 decertification decision, the PRRCT has continued to meet regularly to review the BLM's leasing activity in the PRB and to offer recommendations based on a regional perspective. That board reviewed the Hay Creek II application at a public meeting held on April 19, 2006, in Casper, Wyoming, and recommended that the BLM process the application.

As noted, the BLM leasing process does not authorize mining of federal coal reserves; applicants must first obtain permits to retrieve the coal from appropriate federal and/or state agencies. However, because mining is a logical consequence of issuing a maintenance lease to an existing operation, the impacts of mining the coal are considered in this EIS. All impacts identified in this analysis are addressed as part of the permitting process administered by authorized state and/or federal agencies to insure that they are adequately mitigated.

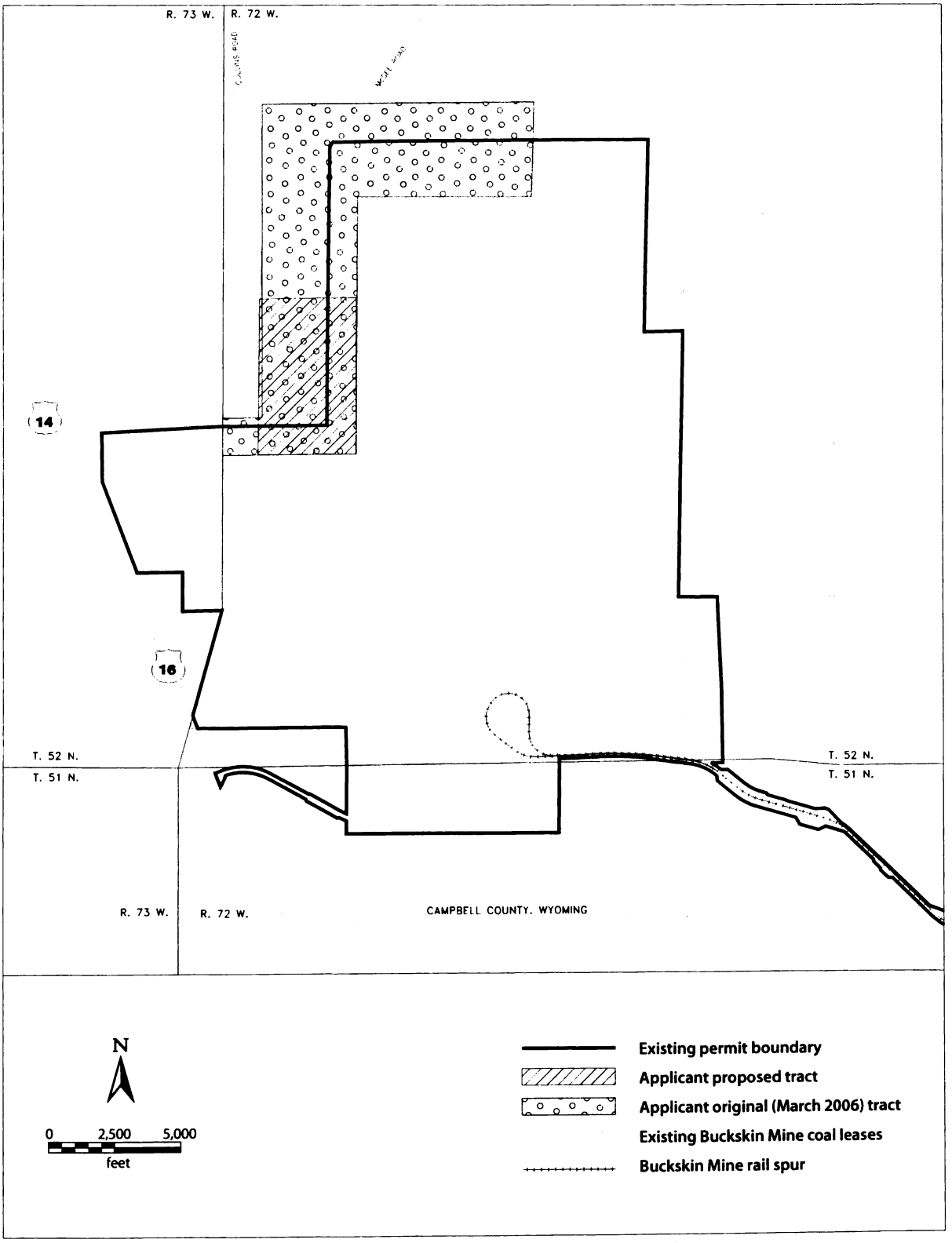
[2] A detailed description of the decertification process is provided in the glossary in chapter 7.



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map 1-1

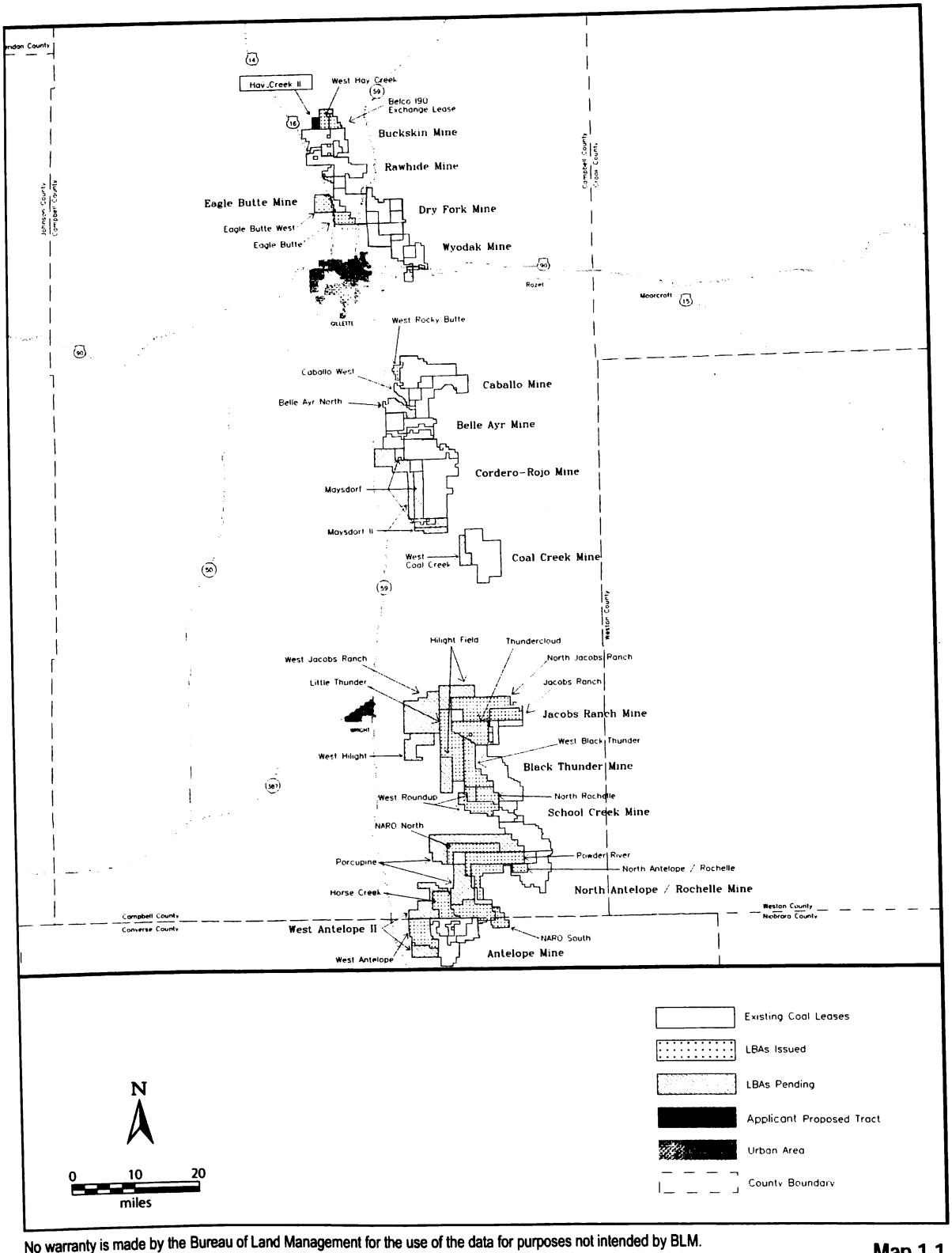
General Location Map with Federal Coal Leases and LBA Tracts



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map 1-2

Applicant Proposed and Original (March 2006) Tracts



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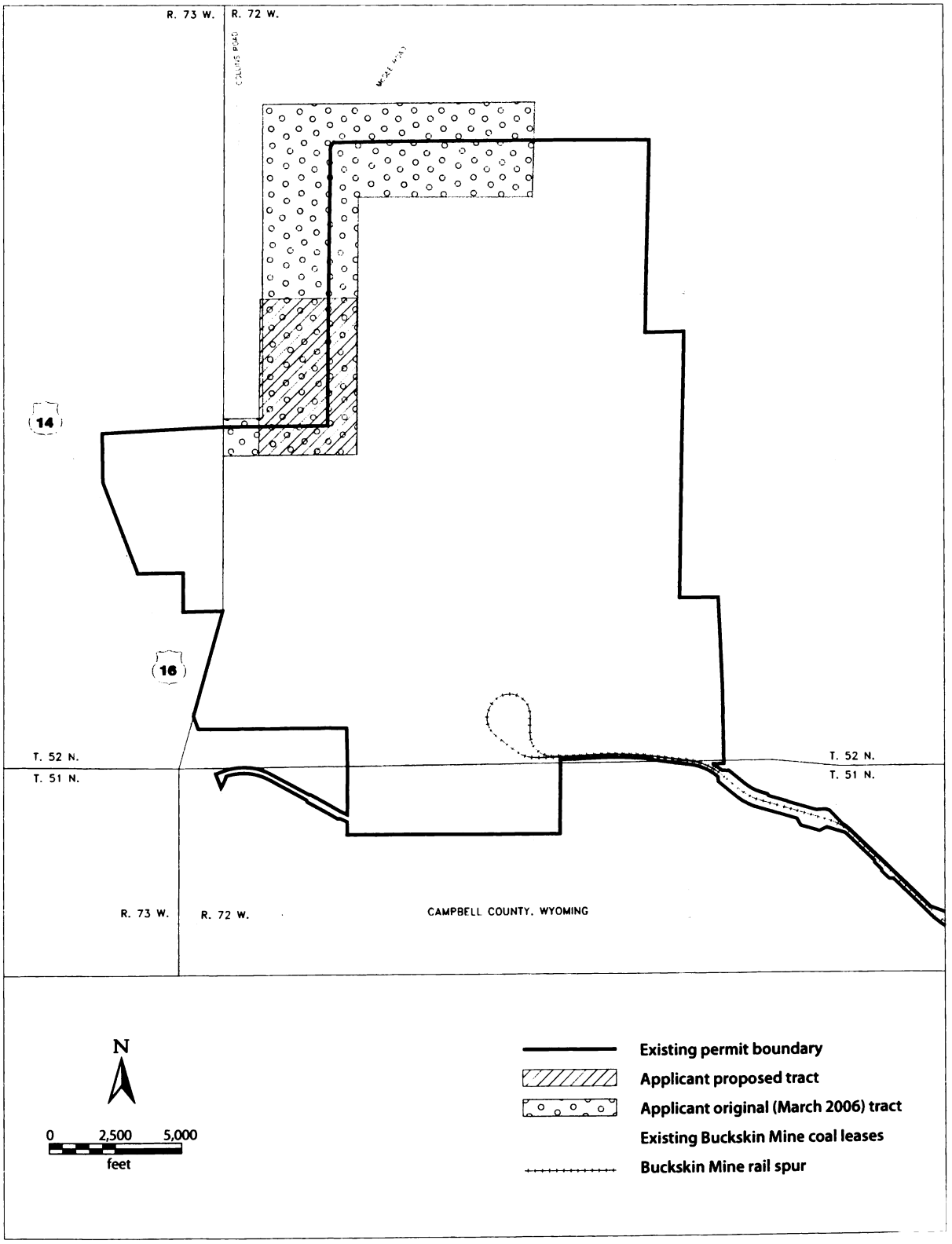
Map 1-1

General Location Map with Federal Coal Leases and LBA Tracts



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map 1-2

Applicant Proposed and Original (March 2006) Tracts

The LBA process by law and regulation is open, public, and competitive. A coal lease is issued to the highest bidder at the sale, if a federal sale panel determines that the high bid meets or exceeds the fair market value of the coal as determined by the BLM's economic evaluation, and if the U.S. Department of Justice determines that no antitrust violations would result from issuing the lease to the high bidder. In return for receiving a lease, a lessee must make the following payments to the federal government: 1) a bonus equal to the amount it bid at the time the lease sale was held (the bonus can be paid in five yearly installments); 2) annual rental payments; and 3) royalty payments when the coal is mined. Federal bonus, rental, and royalty payments are currently divided between the state in which the lease is located and the U.S. Treasury at a 49% and 51% ratio, respectively.

Since the Powder River Federal Coal Region was decertified in 1990, 22 federal coal leases have been sold at competitive sealed-bid sales and 3 exchanges of federal coal in the Wyoming portion of that region have been completed (table 1-1). This is the second application for a maintenance coal tract submitted by the Buckskin Mine since decertification (table 1-1 and map 1-1). Table 1-2 summarizes the 11 lease applications that are currently pending.

Table 1-1. Coal Leases Issued and Exchanges Completed Since Decertification of the Federal Coal Region in 1990, Powder River Basin, Wyoming

LBA Name (Lease Number) Applicant Mine Current Lessee Effective Date	Acres Leased[a]	Mineable Tons of Coal[a]	Successful Bid (in dollars)
LEASES ISSUED			
Jacobs Ranch LBA (WYW-117924) Jacobs Ranch Mine Jacobs Ranch Coal Co. 10/1/1992	1,708.620	147,423,560	20,114,930.00
West Black Thunder LBA (WYW-118907) Black Thunder Mine Thunder Basin Coal Co. 10/1/1992	3,492.495	429,048,216	71,909,282.69
North Antelope Rochelle LBA (WYW-119554) North Antelope and Rochelle Mines Powder River Coal Co.[b] 10/1/1992	3,064.040	403,500,000	86,987,765.00
West Rocky Butte LBA (WYW-122586) No Existing Mine[c] Caballo Coal Co. 1/1/1993	463.205	56,700,000	16,500,000.00
Eagle Butte LBA (WYW-124783) Eagle Butte Mine Foundation Wyoming Land Co.[d] 8/1/1995	1,059.180	166,400,000	18,470,400.00
Antelope LBA (WYW-128322) Antelope Mine Antelope Coal Co.[e] 2/1/1997	617.200	60,364,000	9,054,600.00

Table 1-1. Continued

LBA Name (Lease Number) Applicant Mine Current Lessee Effective Date	Acres Leased[a]	Mineable Tons of Coal[a]	Successful Bid (in dollars)
North Rochelle LBA (WYW-127221) North Rochelle Mine Ark Land Co. 1/1/1998	1,481.930	157,610,000	30,576,340.00
Powder River LBA (WYW-136142) North Antelope Rochelle Mine Powder River Coal Co.[b] 9/1/1998	4,224.225	532,000,000	109,596,500.00
Thundercloud LBA (WYW-136458) Jacobs Ranch Mine Thunder Basin Coal Co., LLC 1/1/1999	3,545.503	412,000,000	158,000,008.50
Horse Creek LBA (WYW-141435) Antelope Mine Antelope Coal Co.[e] 12/1/2000	2,818.695	275,577,000	91,220,120.70
North Jacobs Ranch LBA (WYW-146744) Jacobs Ranch Mine Jacobs Ranch Coal Co. 5/1/2002	4,982.240	537,542,000	379,504,652.00
NARO South LBA (WYW-154001) North Antelope Rochelle Mine BTU Western Resources, Inc. 9/1/2004	2,956.725	297,469,000	274,117,684.00
West Hay Creek LBA (WYW-151634) Buckskin Mine Kiewit Mining Properties, Inc. 1/1/2005	921.158	142,698,000	42,809,400.00
Little Thunder LBA (WYW-150318) Black Thunder Mine Ark Land LT Co. 3/1/2005	5,083.500	718,719,000	610,999,949.80
West Antelope LBA (WYW-151643) Antelope Mine Antelope Coal Co.[e] 3/1/2005	2,809.130	194,961,000	146,311,000.00
NARO North LBA (WYW-150210) North Antelope Rochelle Mine BTU Western Resources, Inc. 3/1/2005	2,369.380	324,627,000	299,143,785.00
West Roundup LBA (WYW-151134) North Rochelle Mine West Roundup Resources, Inc. 5/1/2005	2,812.510	327,186,000	317,697,610.00

Table 1-1. Continued

LBA Name (Lease Number) Applicant Mine Current Lessee Effective Date	Acres Leased[a]	Mineable Tons of Coal[a]	Successful Bid (in dollars)
Eagle Butte West LBA (WYW-155132) Eagle Butte Mine Foundation Wyoming Land Co.[d] 2/20/2008[f]	1,427.770	255,000,000	180,540,000.00
South Maysdorf (Mt. Logan) (WYW-174407)[g] Cordero Rojo Cordero Mining Co. 4/22/2008	2,900.240	288,081,000	250,800,000.00
North Maysdorf (Mt. Logan) (WYW-154432)[g] Cordero Rojo Cordero Mining Co. 1/29/2009	445.890	54,657,000	48,098,424.00
West Antelope II North (WYW-163340)[h] Antelope Mine Antelope Coal, LLC Coal Lease Sale 5/11/2011	2,837.630	350,263,000	297,723,228.00
West Antelope II South (WYW-177903)[h] Antelope Mine Antelope Coal, LLC Coal Lease Sale 6/15/2011	1,908.600	56,356,000	49,311,500.00
Total Leases Issued	**53,929.870**	**6,188,181,776**	**3,509,478,179.69**
EXCHANGES COMPLETED			
EOG (Belco) I-90 Lease Exchange (WYW-150152) EOG Resources (formerly Belco)[i] I-90 Lease Exchanged for New Lease 4/1/2000	599.170	106,000,000	Lease rights to Belco I-90 Lease (WYW0322794)
Pittsburgh & Midway Coal Exchange (WYW-148816) Pittsburgh & Midway Coal Mining Co. Private Land Exchanged for Federal Coal 1/27/2005	2,045.530	84,200,000	6,065.77 acres of land and some minerals in Lincoln, Carbon, and Sheridan Counties, Wyoming
Powder River Coal Company Gold Mine Draw (WYW-003397 and WYW-83394)Powder River Coal Co.[b] AVF Coal Lease 6/30/2006	623.000	47,700,000	Lease rights to 921.6 acres of leased federal coal underlying an AVF exchanged for adjacent bypass coal
Total Exchanges Completed	**3,267.70**	**237,900,000**	

Table 1-1. Continued

LBA = lease by application AVF = alluvial valley floor

[a] Information from sale notice.

[b] Name changed to Powder River Coal, LLC in August 2006 and Peabody Powder River Mining, LLC in 2011.

[c] The West Rocky Butte LBA was originally leased to Northwestern Resources Company. The lease has been assigned and incorporated into the Caballo Mine.

[d] Ownership of the Eagle Butte Mine and Belle Ayr Mine changed from Foundation Coal West, Inc., to Alpha Coal West, Inc. as of July 31, 2009. Notification of new ownership was submitted to the BLM in August 2009.

[e] Notification of a name change to Antelope Coal, LLC was submitted to the WDEQ in August 2008.

[f] Sale date.

[g] The applied-for LBA (original and modified) was classified under one serial number (WYW-154432) until a later determination was made to split it into North and South.

[h] The applied-for LBA (original and modified) was classified under one serial number (WYW-163340) until a later determination was made to split it into North and South.

[i] The EOG Resources Belco Exchange lease is now owned by the Buckskin Mine.

Source: BLM Lease by Application Data Sheets (BLM 2009a).

Table 1-2. Pending Coal Leases by Application, Powder River Basin, Wyoming

LBA Name (Lease Number) Applicant Mine	Application Date	Acres as Applied for	Estimated Coal[a] as Applied for (million tons)	Status
Belle Ayr North (WYW-161248) Belle Ayr Mine	7/6/2004	1,578.74	191.90	Final EIS available 8/20/2009 Record of Decision available 7/30/2010
North Hilight Field (WYW-164812) Black Thunder Mine	10/7/2005	2,613.50	263.40	Final EIS available 7/30/2010 Record of Decision in preparation
South Hilight Field (WYW-174596) Black Thunder Mine	10/7/2005	1,976.69	213.60	Final EIS available 7/30/2010 Record of Decision available 3/4/2011
West Hilight Field (WYW-172388) Black Thunder Mine	1/17/2006	2,370.52	377.90	Final EIS available 7/30/2010 Record of Decision in preparation
West Coal Creek (WYW- 172585) Coal Creek Mine	2/10/2006	1,151.26	57.00	Final EIS available 8/20/2009 Record of Decision available 6/10/2011
Caballo West (WYW-172657) Caballo Mine	3/15/2006	777.49	81.80	Final EIS available 8/20/2009 Record of Decision available 8/6/2010
West Jacobs Ranch (WYW-172685) Jacobs Ranch Mine	3/24/2006	5,944.37	669.60	Final EIS available 7/30/2010 Record of Decision in preparation

Table 1-2. Continued

LBA Name (Lease Number) Applicant Mine	Application Date	Acres as Applied for	Estimated Coal[a] as Applied for (million tons)	Status
Hay Creek II (WYW-172684) Buckskin Mine	3/24/2006; Modified 5/19/2008, 11/28/2008, and 9/3/2010	419.04	77.2	Draft EIS available 3/12/2010 Public hearing 4/22/2010 Final EIS available 7/29/2011
Maysdorf II (WYW-173360) Cordero Rojo Mine	9/1/2006	4,653.84	474.50	Final EIS available 8/20/2009 Record of Decision in preparation
North Porcupine (WYW-173408) North Antelope Rochelle Mine	9/27/2006; Modified 10/12/2007	5,795.78	601.20	Final EIS available 7/30/2010 Record of Decision in preparation
South Porcupine (WYW-176095) North Antelope Rochelle Mine	9/29/2006; Modified 10/12/2007	3,185.96	309.70	Final EIS available 7/30/2010 Record of Decision in preparation
Total LBAs Pending		**30,467.19**	**3,317.80**	

LBA = lease by application; EIS = environmental impact statement

[a] Estimated tons of in-place or mineable coal, as reported in the lease application, or of recoverable coal as reported by the applicant, depending on the mine.

Source: BLM Lease by Application Data Sheets (BLM 2009a).

1.1.3 Existing Buckskin Mine

1.1.3.1 *General Description*

The WDEQ approved the current Buckskin Mine permit (Permit 500 Term T7) on May 22, 2006. The existing Buckskin Mine permit area is approximately 8,011.5 acres and encompasses previously permitted federal and state coal leases (5,877.9 and 659.5 acres, respectively). Map 1-3 shows the proposed tract in relation to the existing mine permit area and leases.

Approximately 6,727.8 acres is expected to be disturbed by activities related to extracting existing coal reserves. The total anticipated disturbance area exceeds the leased area because of the need for mine support activities, described below in section 1.1.3.3. The permit area is larger than the leased or disturbed area to ensure that all disturbed lands are within the permit boundary and to allow for an easily defined legal land description.

As of December 2008, Kiewit estimates the in-place coal reserves in the existing Buckskin Mine leases to be 460.9 million tons, of which 344.3 million tons are recoverable. Through December 2008, the mine had produced a total of 339.8 million tons of coal. Annual production averaged 20.6 million tons over the previous seven years, with a maximum of 25.3 million tons in any single year (Buckskin Mining Company 2002, 2003, 2004, 2005, 2006, 2007, 2008, and 2009). The Buckskin Mine's current air quality permit, as approved by the WDEQ, allows mining of as much as 42 million tons of coal per year. Kiewit estimates that the average annual production at

the mine after January 1, 2009, will be 25 million tons per year. If production continues at that rate, Kiewit estimates that the post-2008 recoverable reserves at the Buckskin Mine would be depleted within approximately 14 years.

Surface ownership within the existing permit area is private. Existing land uses in the proposed tract include rangeland livestock grazing, wildlife habitat, pastureland, dryland cropland, and coal bed natural gas (CBNG) development. All oil and gas production facilities located in the proposed tract are also privately owned. Surface ownership is discussed further in section 1.5 and section 3.11; ownership of oil and gas estates is discussed in section 3.11.

1.1.3.2 *Mine Facilities and Employees*

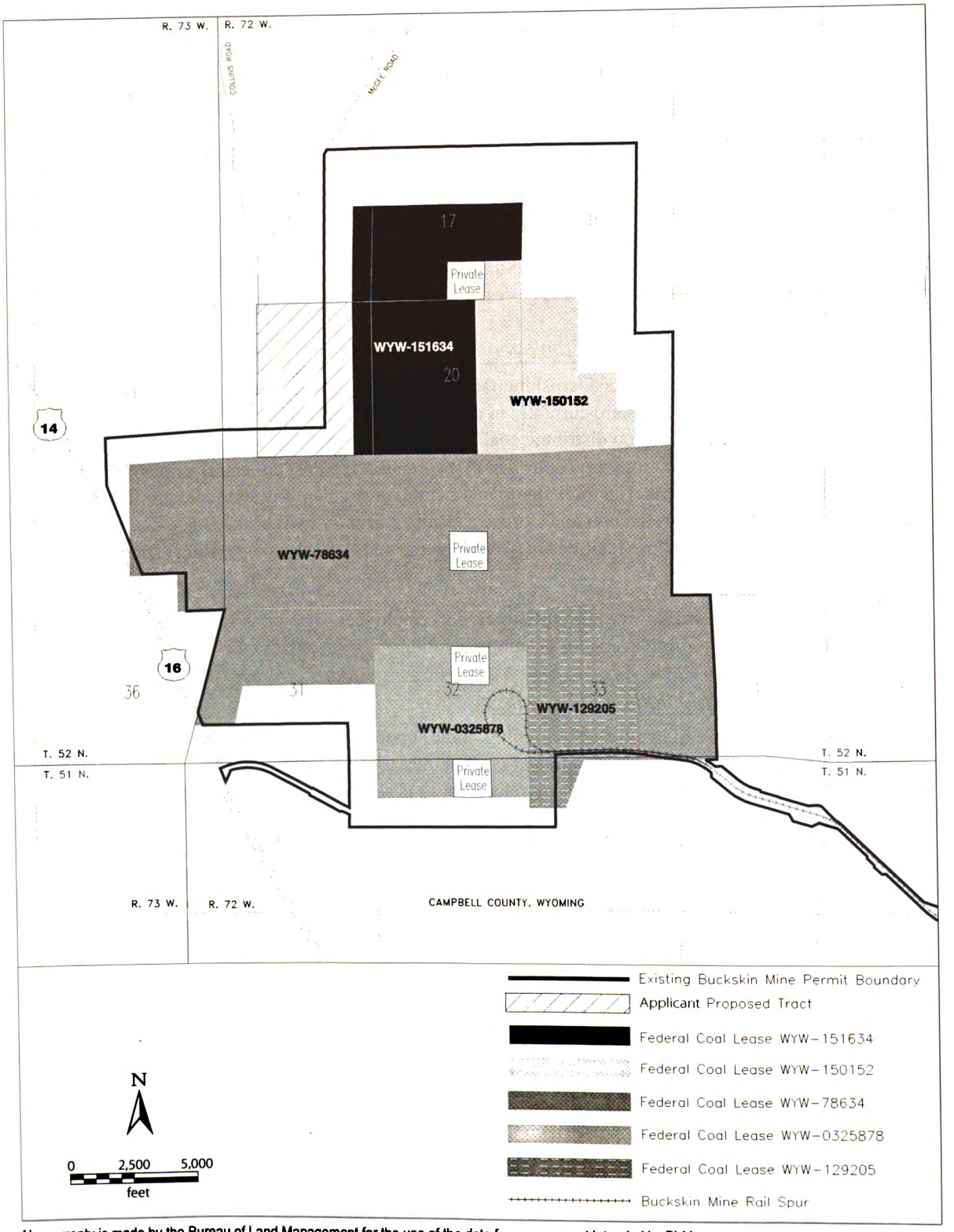
The Buckskin Mine uses one coal crushing facility, which is located at the coal preparation plant. Five active coal storage silos are currently in use at the mine. These facilities provide the capacity to produce, store, and distribute coal at the permitted tonnage. All coal transfer location points and crushing operations are controlled by baghouse-type dust collectors or passive enclosure control systems. The truck dumping operation uses a stilling shed to control fugitive dust. While sufficient production and storage capacity currently exist at the Buckskin Mine, future modifications to those facilities may be implemented to improve operating efficiency and air quality protection.

The Buckskin Mine work force currently totals 338 employees. Kiewit is seeking 10 additional employees to meet staffing needs for existing operations.

1.1.3.3 *Mining Methods and Activities*

Prior to disturbance and in advance of mining, mine support structures such as roads, power lines, substations, and flood- and sediment-control measures are built as needed, and any public utility lines and oil and gas pipelines are relocated, as necessary. During mining, disturbance typically occurs beyond the lease as a result of mine support activities including, but not limited to, highwall reduction, topsoil stripping, stockpile storage, matching reclaimed topography to premining contours, and constructing flood- and sediment-control structures.

The first step of the mining process is soil salvage with suitable heavy equipment such as rubber-tired scrapers. Topsoil—the upper portion of soil that is usually darkly colored and rich in organic material—is removed during initial pit development. Whenever possible, topsoil is hauled from salvage areas and placed directly on recontoured lands, but some topsoil is temporarily stockpiled due to scheduling for later use in pit closure and reclamation. If stockpiling is necessary, topsoil is immediately seeded with a temporary plant mix approved by the WDEQ to provide vegetative cover and prevent wind and water erosion.



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map 1-3

Buckskin Mine's Existing Federal Coal Leases and Applicant Proposed Tract

After soil salvage operations are complete, overburden removal is conducted primarily with truck/shovel fleets. Other equipment used during this phase includes dozers, scrapers, excavators, front-end loaders, graders, and water trucks. When necessary, blasting is used to loosen the overburden; however, the Buckskin Mine does not use cast blasting to move overburden. Blast holes are drilled down through the overburden—the rock and soil above the coal seam, excluding topsoil—to the top of the upper-most mineable coal seam. The drill holes are then loaded with explosives—a mixture of ammonium nitrate and fuel oil—and detonated to fragment the overburden to facilitate efficient excavation. Overburden is placed directly into already mined pits or stockpiled for later use as backfill. The perimeter of the open pit consists of sheer highwalls with vertical heights equal to the combined depth of the overburden, the coal seam, and interburden—the layer of sedimentary rock that separates two mineable coal beds—if present. If necessary, streams are diverted into temporary channels around active mining areas or contained in temporary reservoirs to prevent pits from being flooded.

Coal is currently produced at the Buckskin Mine from two coal seams, the Anderson (averaging 45 feet thick) and the Canyon (averaging 70 feet thick). The blasting and shovel/truck fleet methods used to remove overburden are also used to recover the coal. Coal is mined at several working pit faces at the same time to enable blending of the coal to meet customer quality requirements, to comply with the BLM lease requirements for maximum economic recovery of the coal resource, and to optimize coal removal efficiency with available equipment. Exposed coal seams are cleaned with a dozer, drilled, and blasted to facilitate efficient excavation. Coal is loaded with electric-powered shovels or hydraulic excavators into off-highway haul trucks for transport to the coal preparation plant. Coal haul roads are temporary structures constructed in the mine areas. Haul roads are watered and sprayed with dust suppressant to protect air quality.

Coal from the Buckskin Mine is sold to a variety of domestic power utilities in an open market and is shipped by commercial rail to the purchasing utilities; none of the coal from the mine is used in power plants currently located in the PRB or sold to international markets.

1.1.3.4 *Reclamation Activities*

Reclamation activities follow mining activities according to the WDEQ-approved reclamation plan. A direct permanent impact of coal mining is topographic moderation. Mined-out areas must be reclaimed to the original contours or other topographic configurations approved by the WDEQ to the extent possible. All topographic features such as upland draws, channel bottoms, and elevations are reconstructed to closely mimic premining conditions and ensure proper drainage of water across the reclaimed backfill. While the postmining topography is similar to the premining topography, it is typically gentler and more uniform in appearance. The removal of the coal is temporarily and partially offset by the swelling that occurs when overburden and interburden are blasted, excavated, and backfilled; the influence of swelling is diminished or lost once the backfill has settled. Any disturbed drainages are reclaimed to follow premining patterns. In-channel stockponds and playas (shallow topographic depressions) are replaced to provide livestock and wildlife watering sources. As indicated, all postmining topography, including reconstructed drainages, must be approved by the WDEQ. After mining, the land is

reclaimed to support the premining uses described in section 1.1.3.1. Oil and gas wells, pipelines, and utility easements are reestablished as required.

Most overburden is placed directly into areas where coal has already been removed. Replaced overburden is graded to reflect an approved postmine surface contour, as required by WDEQ and OSM rules. Elevations consistent with an approved postmining topography plan are established as quickly as possible. Once the overburden has been replaced and recontoured, it is sampled and analyzed to verify its suitability as subsoil. Material found to be unsuitable for use in reestablishing vegetation or that could affect groundwater quality due to high concentrations of certain parameters, such as selenium or adverse pH levels, is either removed and treated or adequately covered with suitable overburden material prior to depositing topsoil. Under certain conditions, the postmining topography is not immediately achievable. This occurs when an excess material requires temporary stockpiling, when insufficient material is available from current overburden removal operations, or when future mining could redisturb an area already mined.

Once the postmining topography has been completed, the regraded backfill is ripped to relieve soil compaction. Topsoil is then redistributed using rubber-tired scrapers or haul trucks, dozers, and blades and a seedbed is established by ripping or plowing the soil. Once topsoil preparation is completed, it is immediately seeded using native grasses, forbs, and shrubs that are consistent with the postmining land use. Permanent reclamation must be seeded with WDEQ-approved seed mixes. Reseeded areas are monitored for a minimum of 10 years to evaluate the success of vegetation growth and the establishment of a variety of plant species prior to the final (Phase III) release of the reclamation bond. Other parameters, such as successful use of reclaimed areas by livestock and wildlife, also must be demonstrated before Phase III bond release is achieved. All reclamation goes through rigorous monitoring and a process of success verifications dictated by the WDEQ before any bonds are released on reclaimed lands.

Chapter 4, Section 2(b)(i) of the WDEQ Coal Rules and Regulations requires that rough backfilling and grading follow coal removal as closely as possible based on the mining conditions. According to a recent OSM evaluation of the Wyoming coal mining industry, the 2007 reclamation-to-disturbance ratio was approximately 80% (12,258 total acres reclaimed versus 15,321 total acres disturbed) (OSM 2008). The remaining 20% of disturbance consists of long-term facilities and infrastructure such as coal storage silos and processing plants, roads, and rail lines. Those lands will be reclaimed when mine operations cease and all infrastructure has been removed from the site. The WDEQ also requires that mining companies post a reclamation bond on all acres disturbed by their activities within their own permit boundary. The bond must be large enough to cover the cost of completing reclamation, should the company default on its obligations. One major condition for receiving Phase III bond release is to document that the reclaimed area has achieved the vegetative cover and production, and plant species diversity equal to a predetermined native comparison area, the reference area. For example, if shrubs were present during baseline vegetative inventories, the reclaimed area must also have a shrub density of one plant per square meter over 20% of the area. The Buckskin Mine has a vigorous annual

program of vegetation monitoring to ensure that reclamation efforts are proceeding in a positive manner to achieve final bond release.

Land Status categories are calculated on an annual basis and reported in the Annual Report to the WDEQ. The parameters of each phase of bond release are described in detail in WDEQ Guideline 20, available on the agency's website at http://deq.state.wy.us/lqd/guidelines.

Table 1-3 provides a general summary of reclaimed acreages at the Buckskin Mine and their respective stages of bond release. As of December 31, 2008, Buckskin had disturbed approximately 3,815 acres over the life of the mine, of which about 1,035 (27.3%) are associated with long-term mining facilities that will not be reclaimed until all mining operations have ceased. Approximately 1,256 (33%) of the 3,815 disturbed acres had been permanently reclaimed through that year. Approximately 4,018 acres and 1,271 acres were disturbed and reclaimed, respectively, through 2009. Because the analyses for the draft EIS were performed using data collected through 2008, data from 2009 is not included in further discussions in this document with the exception of certain specific resources in response to public comments on the draft EIS.

Permanently reclaimed areas refer to all affected lands that have been backfilled, graded, re-topsoiled, and permanently seeded according to approved practices specified in the WDEQ approved Reclamation Plan for the mine. Permanently reclaimed lands must then meet various benchmarks associated with vegetative conditions as well as wildlife and livestock grazing before they achieve Phase III bond release.

Reclaimed lands often fall into multiple bond release categories at the same time due to two primary factors: the overlap between activities in a given reclamation area; and the time-lag between reclamation actions, such as reseeding with permanent seed mixes, and responses to those actions (e.g., vegetation growth and production) necessary to receive Phase III bond release. Consequently, the reclaimed acreages shown in table 1-3 for three phases of bond release do not add up to the total 1,256 acres of reclaimed land through 2008.

To achieve Phase III Bond Release, reclaimed lands must also support the postmining land use (i.e., domestic livestock grazing and wildlife use), as determined through grazing trials and by monitoring wildlife use during the reclamation period. At the Buckskin Mine, reclamation is typically grazed by fencing multiple fields together to create a larger pasture; multiple pastures are sometimes also combined. The mine first began grazing cattle in 1998 and continued grazing efforts in 9 of the 10 subsequent years (1999 through 2008). The number of cattle grazed during a given period ranged from 107 to 200 during that period, with an average grazing time of 34 days (range 12 to 63 days) in a given pasture. Grazing cattle consisted primarily of cow-calf pairs, with a few bulls included in some years. Annual wildlife monitoring efforts at the Buckskin Mine are described in section 3.10, and have included reclaimed lands as they became established. The WGFD reviews the annual wildlife report each year to ensure that proper survey protocols have been followed and to monitor impacts to wildlife populations in the

vicinity of the surface coal mines in the PRB. That agency has not identified any deficiencies in the Buckskin Mine annual wildlife reports.

Table 1-3. Summary of Land Status Acreage at the Buckskin Mine through December 2008

Land Status	Acres	Approximate Percentages
Undisturbed areas	4,196	52% of 8,011 total acres in permit area
Disturbed areas	3,815	48% of 8,011 total acres in permit area
Long-term facilities[a]	1,035	27% of disturbance
Active mining and reclamation	1,525	40% of disturbance
Reclaimed land[b]	1,256	33% of disturbance
Phase I[c] bond release	1,212	96% of reclamation
Phase II[d] bond release	250	20% of reclamation
Phase III[e] final bond release	250	20% of reclamation

[a] Long-term facilities includes stockpiles, hydrologic control structures, mine buildings, coal-loading facilities, the main access road, electrical substations, vehicle parking areas, the railroad loop, environmental monitoring areas, and other similar structures and features that will not be reclaimed until all mining operations have ceased.

[b] Reclaimed land refers to previously disturbed areas that have been planted with permanent seed mixes.

[c] Phase I refers to areas where backfilling, re-grading, topsoil replacement, contouring, and drainage control have been completed in a bonded area in accordance with the mine's approved reclamation plan.

[d] Phase II refers to areas that have achieved Phase I release, and also have vegetation species composition commensurate with that of the seed mix(es) and species composition required by the WDEQ-approved Reclamation Plan. Mines often go directly from Phase I to Phase III due to the overlap between Phase II and Phase III.

[e] Phase III refers to lands that have been reclaimed to the approved postmine land use and with successful restoration of wildlife habitat; where revegetation performance standards, shrub establishment goals, and tree replacement requirements have been met; the postmining groundwater, and surface water quality and quantity support land uses; any approved postmining road types and corridors on evaluated acreage are in place and functional; and any temporary structures present on lands being evaluated have been removed.

1.1.3.5 *Hazardous and Solid Waste*

Wastes produced by current mining activities at Buckskin are handled according to the procedures described in WDEQ Mine Permit 500 Term T7, approved May 22, 2006. Solid waste produced at the existing Buckskin Mine consists of floor sweepings, shop rags, lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. A small portion (< 5%) of the solid wastes produced at the mine is disposed of within the Buckskin Mine permit boundary in accordance with WDEQ approved solid waste disposal plans. Solid waste is also disposed of at the Campbell County landfill. Sewage is handled by WDEQ-permitted sewage systems present within the existing mine facilities.

Maintenance and lubrication of most of the equipment takes place at existing shop facilities at the Buckskin Mine. Major lubrication, oil changes, and other maintenance operations for most equipment are performed inside the service building bays. Used oil and grease are contained and deposited in storage tanks in that building. All collected used oils and grease are then beneficially recycled off site or used for energy recovery.

The Buckskin Mine has reviewed the EPA's "Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Re-authorization Act (SARA) of 1986 (as amended)" and the EPA's "List of Extremely Hazardous Substances," as defined in 40 CFR 355 (as amended), for hazardous substances used at the mine. Hazardous substances are designated under Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended; extremely hazardous substances are listed in Section 302 of the Emergency Planning and Community Right to Know Act. The mine maintains files containing Material Safety Data Sheets for all chemicals, compounds, and/or substances that are or would be used during the course of mining.

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

The mine must also comply with emergency reporting requirements for releases of hazardous materials. Any release of hazardous or extremely hazardous substances in excess of the reportable quantity, as established in 40 CFR 117, is reported as required by CERCLA, as amended. The materials for which such notification must be given are listed in Section 302 of the Emergency Planning and Community Right to Know Act and Section 102 of CERCLA, as described above. If a reportable quantity of a hazardous or extremely hazardous substance is released, immediate notice is given to the WDEQ and all other appropriate federal and state agencies.

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

- spill prevention control and countermeasure plans;
- spill response plans;
- stormwater pollution prevention plans;
- inventories of hazardous chemical categories pursuant to Section 313 of SARA, as amended; and
- emergency response plans.

In addition, all mining operations must comply with regulations promulgated under the Resource Conservation and Recovery Act, Federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, Toxic Substances Control Act, Mine Safety and Health Act, and the CAA. In addition, mining operations must comply with all attendant state rules and regulations relating to hazardous material reporting, transportation, management, and disposal.

Compliance with these regulations is the current practice at the Buckskin Mine. Kiewit's acquisition of the proposed tract or alternative tract configuration would not change these practices, nor the type and quantity of any wastes generated and disposed of by the mine.

1.2 Purpose and Need for Action

As described in section 1.1.1, the purpose of the Proposed Action is to extend the life of existing operations at the Buckskin Mine. The Proposed Action would not expand operations at the Buckskin Mine, but would maintain current levels of production and extend the life of the mine by approximately two years[3]. The permitting process that follows the lease sale takes approximately five years to complete. Kiewit is applying for the federal coal reserves in the proposed tract now so that it can secure coal resources to market, enter into new contracts, and complete the permitting process in time to mine the new lease in a logical progression.

More broadly, the Proposed Action responds to the continued demand for coal in the United States, primarily for the purpose of generating electricity. According to the U.S. Energy Information Administration (2008a), the United States has the world's largest known coal reserves. Demand for this coal is driven by the electric power sector, which accounts for about 92% of coal consumption (U.S. Energy Information Administration 2008a, 2008b). Approximately half of the electricity currently generated in the United States comes from coal (U.S. Department of Energy 2009a). Wyoming coal is used to generate electricity in 37 other states (Wyoming Mining Association 2009).

The Energy Policy Act of 2005 directs federal agencies to undertake efforts to ensure energy efficiency and the production of secure, affordable, and reliable domestic energy. A primary goal of the National Energy Policy is to increase domestic energy supplies from diverse sources such as oil, gas, coal, hydropower, wind, solar, and nuclear power in a long-term effort to reduce the United States' dependence on foreign energy sources. The BLM recognizes that the continued extraction of coal is essential to meet the nation's future energy needs and goals. Consequently, private development of federal coal reserves is integral to the BLM's coal leasing program under the authority of the Mineral Leasing Act of 1920, as well as the Federal Land Policy Management Act (FLPMA) and the Federal Coal Leasing Amendments Act of 1976. Under FLPMA, the BLM is mandated to manage public lands for multiple-use so that the lands are utilized in the combination that will best meet the present and future needs of the American people. FLPMA authorizes the BLM to manage the use, occupancy, and development of public lands through leases and permits (43 CFR 2710).

Management—leasing, mining, and selling—of federal coal resources in the PRB contributes to a reliable supply of coal for electric power generation in the United States. The low-sulfur compliance coal from the PRB enables coal-fired power plants to meet current CAA requirements and increasing demand without potentially significant increases in power costs

[3] Assuming that coal production would continue at the most recent (2008) average annual coal production rate of 25 million tons per year.

while new technologies are developed to improve efficiency and reduce emissions. Management of federal coal resources in the PRB also generates revenue—in the form of bonus, annual rental, and royalty payments—that is used to fund numerous infrastructure and social projects in Wyoming.

1.3 Regulatory Authority and Responsibility

The authorities and responsibilities of the BLM and other concerned regulatory agencies are described in this section, including a detailed description of the permitting process that follows BLM leasing of federal coal reserves.

The Hay Creek II application was submitted and will be processed and evaluated under the following federal authorities:

- Mineral Leasing Act of 1920, as amended;
- Multiple-Use Sustained Yield Act of 1960;
- National Environmental Policy Act;
- Federal Coal Leasing Amendments Act of 1976;
- Federal Land Policy Management Act; and
- Surface Mining Control and Reclamation Act of 1977 (SMCRA).

As described previously, the BLM is the lead agency responsible for leasing federal coal reserves under the Mineral Leasing Act of 1920, as amended by the Federal Coal Leasing Amendments Act in 1976. The BLM is also responsible for preparing this EIS to evaluate the potential environmental impacts of issuing a coal lease and the subsequent mining of that coal, which would be the logical outcome of any leasing action. As part of the EIS and leasing processes, the BLM also has a responsibility to consult with and obtain the comments and assistance of cooperating agencies, such as the OSM and WDEQ, as well as other state and federal agencies that have jurisdiction by law or special expertise with respect to potential environmental impacts.

After a federal coal lease is issued, the SMCRA gives the OSM primary responsibility to administer programs that regulate surface coal mining operations, as well as the surface effects of underground coal mining operations. Pursuant to Section 503 of the SMCRA, the WDEQ developed a permanent program authorizing that agency to regulate surface coal mining operations and surface effects of underground mining on nonfederal lands within Wyoming. In November 1980, the Secretary of the Interior approved that program. In January 1987, pursuant to Section 523(c) of the SMCRA, the WDEQ entered into another cooperative agreement with the Secretary of the Interior authorizing the WDEQ to regulate surface coal mining operations and surface effects of underground mining on federal lands within the state; no federal surface is included in any of the analysis areas for the Hay Creek II EIS.

The net result of those actions was to give the WDEQ the authority to serve as an agent of the OSM to issue permits to mine coal in Wyoming. Before a newly leased area can be disturbed, the lessee must submit an extensive permit application package to the WDEQ to amend the current permit document to include any proposed coal mining and reclamation operations associated with the newly leased coal reserves. That agency acts as the conduit for distributing the package to other divisions within the WDEQ, as well as other state and federal agencies with a vested interest or cooperator status in the permitting process and future impacts of mining.

The WDEQ carefully reviews the permit application package to ensure that it complies with the permitting requirements, and that the coal mining operation will meet the performance standards of the approved Wyoming program. The BLM and other state and federal agencies also review the application package to ensure that it complies with the terms of the coal lease, applicable state requirements, the Mineral Leasing Act, NEPA, and other state and federal laws and their associated regulations.

If the permit application package complies, the WDEQ issues a permit to the applicant to conduct coal mining operations. The final permit application document and the actual permit are then submitted to OSM, which recommends approval, approval with conditions, or disapproval of the Mineral Leasing Act mining plan to the Assistant Secretary of the Interior, Land and Minerals Management. Before the mining plan can be approved, the BLM must approve the Resource Recovery Protection Plan for mining the tract.

If a proposed LBA tract is leased to an existing mine, the lessee is required to revise its coal mining permit before the coal can be extracted, following the processes outlined above. As a part of that process, a detailed new plan must be developed showing how the newly leased lands would be mined, mitigated, and/or reclaimed. The total disturbance area typically exceeds the leased area because of the need for mine support activities, described in section 1.1.3.3. As noted, the mining, mitigation, and reclamation plans must all be approved by appropriate state and federal agencies before mining can proceed in newly leased coal tracts. All special provisions within the existing permit document, such as species-specific protective measures for plant and animal species of concern, also apply to additional lands within new coal tracts.

The WDEQ enforces the performance standards and permit requirements for reclamation during a mine's operation and has primary authority in environmental emergencies. The OSM retains oversight responsibility over the WDEQ for this enforcement. Appendix A presents other federal and state permitting requirements that must be satisfied to mine the proposed tract.

1.4 Relationship to BLM Policies, Plans, and Programs

In addition to the federal acts listed under section 1.3, guidance and regulations for managing and administering public lands—including the federal coal reserves in the Kiewit application—are set forth in 40 CFR 1500 (Protection of Environment), 43 CFR 1601 (Planning, Programming, Budgeting), and 43 CFR 3400 (Coal Management).

Specific guidance for processing applications follows BLM Manual 3420, Competitive Coal Leasing (BLM 1989) and the 1991 *Powder River Regional Coal Team Operational Guidelines for Coal Lease-By-Applications* (BLM 1991). The *National Environmental Policy Act Handbook* (BLM 2008b) has been followed in developing this EIS.

1.5 Conformance with Existing Land Use Plans

The Federal Coal Leasing Amendments Act of 1976 requires that lands considered for leasing be included in a comprehensive land use plan and that leasing decisions be compatible with that plan. The BLM *Approved Resource Management Plan (RMP) for Public Lands Administered by the Bureau of Land Management Buffalo Field Office* (BLM 2001), governs and addresses the leasing of federal coal in Campbell County. The 2001 document is an update of the previous *Buffalo Resource Area RMP* (BLM 1985), and will be referred to as the 2001 RMP update throughout this EIS.

The major land use planning decision that the BLM must make concerning federal coal resources is a determination of which coal reserves are acceptable for further consideration for leasing. The BLM uses four screening procedures to identify these coal reserves. These screening procedures require the BLM to:

- estimate the development potential of the federal coal reserves;
- apply the unsuitability criteria listed in the regulations at 43 CFR 3461;
- make decisions related to multiple land uses that eliminate federal coal deposits from consideration for leasing to protect other resource values; and
- consult with surface owners who meet the criteria defined in the regulations at 43 CFR 3400.0-5(gg)(1) and (2).

Only those federal coal reserves that pass these screens receive further consideration for leasing. The BLM has applied these coal screens to federal coal reserves in Campbell County several times, beginning in the early 1980s. In 1993, the BLM began the most recent process of reapplying these screens in Campbell, Converse, and Sheridan counties in eastern Wyoming. This screening analysis process, which includes the portion of Campbell County where the proposed tract is located, was adopted in the 2001 RMP update, and the results were included as Appendix D of that update. That document can be viewed in the 2001 documents section on the Wyoming BLM website at: http://www.blm.gov/rmp/WY/application/index.cfm/rmpid=101.

Under the first coal screening procedure, a coal tract must be located within an area that has been determined to have coal development potential in order to be acceptable for further consideration for leasing (43 CFR 3420.1-4(e)(1)). In the coal screening analyses published in its 2001 RMP update, the BLM identified the proposed tract as being in an area with this coal development potential.

The second screening procedure requires the application of coal mining unsuitability criteria listed in the federal coal management regulations (43 CFR 3461). The coal mining unsuitability criteria were applied to lands in the PRB with high to moderate coal development potential, including the proposed tract and adjacent coal reserves identified by the BLM, during the coal screening conducted for the 2001 RMP update. Appendix B of this EIS summarizes the unsuitability criteria, describes the general findings for the 2001 RMP update, and presents a validation of these findings for the proposed tract, as well as adjacent unleased federal coal reserves. Chapter 2 provides detailed descriptions of the proposed tract and those adjacent coal reserves, as well as the result of the review of the unsuitability criteria specific to both areas. As indicated in appendix B, several criteria will be further evaluated during the leasing process.

The third coal screening procedure consists of a conflict analysis for multiple-use activities on the lands associated with the coal reserves that are under consideration for leasing. In accordance with 43 CFR 3420.1-4(e)(3), that analysis must be completed to identify and "eliminate additional coal deposits from further consideration for leasing to protect resource values of a locally important or unique nature not included in the unsuitability criteria." The 2001 RMP update addresses two types of multiple land-use conflicts: municipal/residential conflicts and multiple mineral development (coal versus oil and gas) conflicts. The proposed tract does not lie within or near an identified buffer zone surrounding an existing community; therefore, no federal coal reserves within that tract configuration have been eliminated from further consideration for leasing due to municipal/residential conflicts.

The 2001 RMP update includes two decisions related to multiple mineral development conflicts in Campbell, Converse, and Sheridan counties. With respect to oil and gas leasing in coal mining areas, it determined that oil and gas tracts that would interfere with coal mining operations would not be offered for lease but that, where possible, oil and gas leases would be issued with specific conditions to prevent a development conflict with coal mining operations. With respect to coal leasing in oil and gas fields, the 2001 RMP update states that coal leasing in producing oil and gas fields would be deferred unless or until coal development would not interfere with the economic recovery of the oil and gas resources, as determined on a case-by-case basis.

The BLM's evaluation of the potential for conflict with the development of oil and gas resources within the proposed tract is discussed in section 3.3. The BLM's policy and guidance on conflicts between surface coal mining and CBNG development is to optimize the recovery of both resources and to ensure that the public receives a reasonable return, as explained in BLM Instruction Memorandum No. 2006-153 (BLM 2006a).

The fourth coal screening procedure requires consultation with surface owners who meet the criteria defined in the regulations at 43 CFR 3400.0-5(gg)(1) and (2)[4]. Surface owner consultation was conducted as part of the coal screening analyses published in the 2001 RMP update. Private surface owners in the Gillette coal development potential area (including Campbell County and northern Converse County) were provided the opportunity to express their preference for or against surface mining of federal coal under their private surface estate during that screening. At that time, no attempt was made to distinguish qualified surface owners. Appendix D of the 2001 RMP update states that "no area should be dropped from further consideration for leasing as a result of responses received from surface owners." Therefore, no federal coal reserves within the proposed tract have been eliminated from further consideration for leasing due to qualified surface owner conflicts at this time.

Private surface owners who are found to be qualified must consent to leasing before the BLM can offer the underlying federal coal reserves for lease. The BLM will review the current surface ownership in the final tract configuration. Prior to offering any tract for lease, consent to leasing must be provided for any lands held by any qualified surface owner.

In summary, the proposed tract has been subjected to the four coal planning screens and determined acceptable for further consideration for leasing. Thus, a decision to lease the federal coal reserves in this application would be in conformance with the 2001 RMP update.

1.6 Consultation and Coordination

1.6.1 Initial Involvement

The BLM received the Hay Creek II coal lease application on March 24, 2006. The BLM, Wyoming State Office, Division of Minerals and Lands, initially reviewed the application and ruled that the application and lands involved met the requirements of regulations governing coal leasing on application (43 CFR 3425).

On September 18, 2006, the BLM Wyoming State Director notified the Governor of Wyoming that Kiewit had filed a lease application with the BLM for the proposed tract. The PRRCT reviewed this lease application at a public meeting held in Casper, Wyoming, on April 19, 2006, following Kiewit's presentation about the existing Buckskin Mine and the pending lease application for the proposed tract. The PRRCT recommended that the BLM continue to process this application. The major steps in processing a coal LBA, including permitting steps once the lease is issued, are shown in appendix C.

The BLM published a notice of intent to prepare an EIS and a notice of public meeting in the *Federal Register* on Friday, December 21, 2007. The publication announced the time and location of a public scoping meeting and requested public comment on the application. Letters

[4] Chapter 7 includes a definition of the term "qualified surface owner," based on these regulations.

requesting public comment and announcing the time and location of the public scoping meeting were mailed to all parties on the distribution list.

The BLM published a notice of public scoping meeting in the *Federal Register* and Gillette *News-Record* newspaper. A BLM news release announcing preparation of the Hay Creek II coal lease application EIS was issued on January 17, 2008. The public scoping meeting was held on January 31, 2008, in Gillette, Wyoming. At the public meeting, the BLM presented information and accepted public comments about the application.

Chapter 5 provides a list of all federal, state, and local governmental agencies that were consulted in preparation of this EIS, all contributors to and reviewers of the information provided in this document, and the distribution list for this EIS.

1.6.1.1 Issues and Concerns

Issues and concerns expressed by the public and government agencies relating to the potential impacts of leasing the proposed tract, specifically, and/or to previous coal lease applications in general include:

- potential conflicts between coal mining and both existing and proposed conventional oil and gas development and CBNG development;
- potential cumulative impacts of coal leasing decisions combined with other existing and proposed development in the PRB;
- validity and currency of resource data;
- potential impacts on public access;
- potential impacts on cultural and paleontological resources;
- potential impacts on greater sage-grouse and other wildlife;
- potential impacts on threatened and endangered species and other species of concern;
- potential impacts on wetland resources;
- potential impacts related to coal loss during transport;
- potential impacts on air quality (including cumulative impacts on visibility);
- potential impacts on surface and groundwater quality and quantity;
- potential impacts of and possible mitigation for nitrogen oxide emissions resulting from blasting of coal and overburden;
- potential impacts on human health;
- the need to include reasonably foreseeable actions such as the construction and operation of the Dakota, Minnesota & Eastern Railroad and power plants in the cumulative analysis;
- the need to address coal combustion residues and other byproducts from coal-fired power plants;

- the need to address increasing coal production in the PRB in the cumulative analysis;
- the need to lease enough coal that the revenues generated are sufficient for use in the local community;
- the need to address site-specific greenhouse gas emissions; and
- climate change.

1.6.1.2 Draft Environmental Impact Statement

Copies of the draft EIS were sent to all parties on the distribution list and copies were made available for review at the BLM offices in Casper, Buffalo, and Cheyenne, Wyoming. The document was also made available for review on the BLM Wyoming website at: http://www.blm.gov/wy/st/en/info/NEPA/cfodocs/HayCreekII.html.

The EPA published a notice in the *Federal Register* on March 12, 2010, announcing the availability of the draft EIS. A 60-day comment period on the draft EIS commenced with publication of that notice. The BLM also published a notice of availability/notice of public hearing in the *Federal Register* on March 12, 2010. That notice announced the date and time of a public hearing to be held during the 60-day comment period. The purpose of the hearing, held in Gillette, Wyoming on April 22, 2010, was to solicit public comments on the draft EIS and on the fair market value, maximum economic recovery, and proposed competitive sale of federal coal from the proposed tract. The BLM also published a notice of public hearing in the *Gillette News-Record* and other local newspapers.

1.6.1.3 Final Environmental Impact Statement

All substantive written comments received on the draft EIS have been included, with corresponding responses from the BLM, in appendix D of this final EIS. Both the BLM and the EPA will publish a notice of availability of the final EIS in the *Federal Register*. After a 30-day availability period, the BLM will make a decision to hold or not to hold a competitive lease sale for the federal coal reserves within the LBA area.

1.6.2 Future Involvement

1.6.2.1 *Record of Decision*

The record of decision (ROD) for the tract is mailed to all parties on the mailing list and others who commented on the draft EIS during the comment period. Members of the public and/or the applicant can appeal the BLM decision to hold or not to hold a competitive sale and issue a lease for the final tract configuration. An appeal of the BLM's decision must be filed within 30 days from the date that the notice of availability for the ROD is published in the *Federal Register*. The decision can be implemented at the end of the 30-day appeal period, if no appeal is received. If a competitive lease sale is held, it will follow the procedures set forth in 43 CFR 3422, 43 CFR 3425, and BLM Handbook H-3420-1 (Competitive Coal Leasing).

1.6.2.2 *U.S. Department of Justice Consultation*

After a competitive coal lease sale is held, but before the lease is issued, the BLM must solicit the opinion of the U.S. Department of Justice on whether the planned lease issuance creates a situation inconsistent with federal antitrust laws. The Department of Justice has 30 days to make this determination. If the Department of Justice has not responded in writing within the 30 days, the BLM can issue the lease.

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the regulations and documents that guide the identification of alternatives to the Proposed Action, explains how the alternatives were developed and how a final tract configuration will be determined, and, finally, provides detailed descriptions of the Proposed Action, alternatives, and tract configurations considered in this EIS[1].

This final EIS analyzes three alternatives: the Proposed Action, Alternative 1 (No Action), and Alternative 2 (additional lands added by the BLM). Two additional alternatives were considered but were not analyzed further in this EIS because they were either not logistically feasible (Alternative 3—new mine start) or substantially different (Alternative 4—delay the lease sale) than analyzed alternatives. Supporting information for excluding these alternatives is provided in section 2.3.

The BLM selected Alternative 2 as the Preferred Alternative after considering all of the input received on the draft EIS from individuals, agencies, and other interested parties during the public comment period. The comment period began upon the BLM's issuance of a notice of availability of the draft EIS on March 12, 2010, and lasted for 60 days. This process offered the public sector an opportunity to submit written input during the comment period and oral comments at a public hearing that occurred on April 22, 2010. In addition to comments on the environmental effects described in the draft EIS, the BLM considered fair market value and maximum economic recovery factors, geologic data, and coal data when identifying the Preferred Alternative presented in this final EIS. Following a 30-day public comment period on the final EIS, the BLM will issue a ROD. The ROD will define the final delineation of the Hay Creek II tract. Based on federal regulations (43 CFR 3425.1-9)[2], the final coal lease tract can be any configuration that is within the area analyzed for this EIS, as described in section 2.2.3 and chapter 3. If the BLM decides to offer the tract for lease, then a sale will be held. If a sale is held, the bidding would be open to any qualified bidder.

2.1 Background

To process an LBA, the BLM must evaluate the quantity, quality, maximum economic recovery, and fair market value of the federal coal, and fulfill the requirements of NEPA by evaluating the environmental impacts of leasing that coal. NEPA also requires that the BLM consider and evaluate "reasonable alternatives" to meet the objectives of the Proposed Action while avoiding or minimizing environmental impacts. Reasonable alternatives are defined by NEPA as those that are technically, economically, and environmentally practical and feasible to satisfy the stated purpose and need for the proposed federal action. NEPA also requires the analysis of a "no

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

[2] "The authorized officer may add or delete lands from an area covered by an application for any reason he/she determines to be in the public interest."

action" alternative (i.e., the consequence of continuing ongoing activities without a new leasing action).

In addition to NEPA requirements, the BLM must meet the requirements contained in the *Competitive Coal Leasing Manual* (BLM 1989) and follow the regulations for federal coal leasing by application under 43 CFR 3425. Like NEPA, the *Competitive Coal Leasing Manual* requires that the BLM evaluate other potential boundaries for federal coal tracts that include and/or are near the proposed tract.

In its consideration of alternative tract boundaries, the BLM must meet the following goals: 1) achieve maximum economic recovery of the coal resource; 2) maintain or increase the potential for competition; and 3) avoid future bypass or captive tract situations (i.e., stranding an isolated tract and hindering future recovery of those coal resources). In accordance with these goals, the BLM has identified an area encompassing the proposed tract and adjacent unleased federal coal reserves. This area is referred to as the BLM study area (map 2-1). As described under section 2.0, the BLM could decrease the size of the proposed tract or increase it to include some or all of the federal coal reserves in the BLM study area.

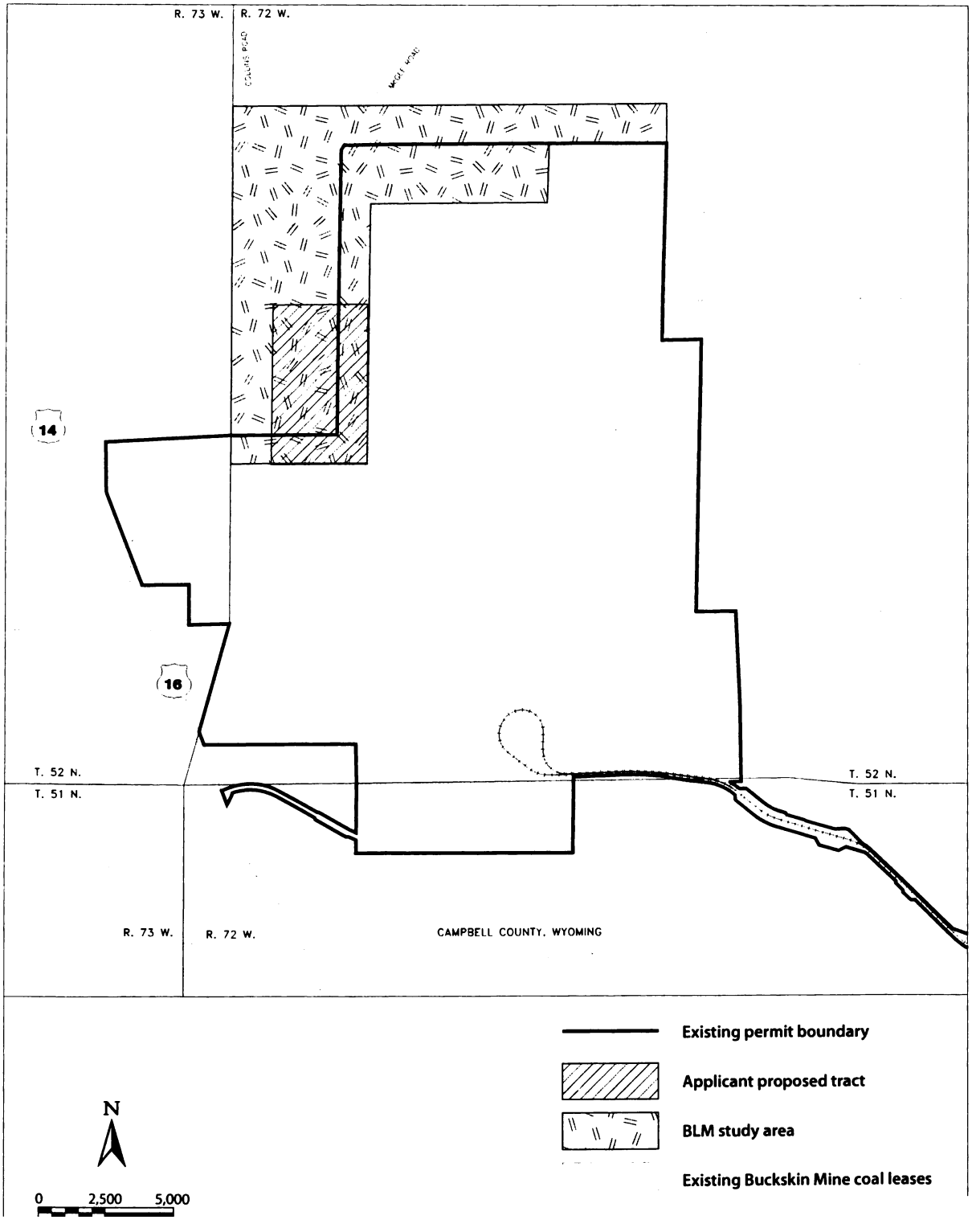
2.2 Description of the Proposed Action and Alternatives

Under the Proposed Action, the BLM would hold a competitive sale and issue a lease for the federal coal reserves included in the proposed tract, which is a contiguous block of federal coal reserves adjacent to existing coal leases at the Buckskin Mine (map 2-1). Two alternatives to the Proposed Action are analyzed in this EIS:

1. Alternative 1 (No Action): Reject the application to lease federal coal reserves in the proposed tract and not offer a tract for sale at this time.
2. Alternative 2 (the BLM Preferred Alternative): Hold a competitive sale and issue a lease for the federal coal reserves included in an alternative tract configuration that would be delineated from some or all of the BLM study area.

See section 2.3 for a discussion of other alternatives considered but eliminated from further analysis in this EIS.

Under the Proposed Action or Alternative 2, the Buckskin Mine permit area would be enlarged to include the newly leased tract before mining activities could begin. To do this, Kiewit would submit an application to the WDEQ to amend its existing surface mining permit and mining plan, including corresponding monitoring, reclamation, and mitigation plans, to include the new lease area.



2.2.1 Proposed Action

Under the Proposed Action, the BLM would hold a competitive sale, as described under section 1.1.2, and would issue a lease for the federal coal reserves included in the proposed tract. The Proposed Action assumes that Kiewit would be the successful bidder and would incorporate the proposed tract into its existing mine operations. The Proposed Action would not expand operations at the Buckskin Mine, but would maintain current levels of production for an additional two years beyond the current life-of-mine estimate.

2.2.1.1 Description of the Proposed Tract

The proposed tract is adjacent to existing Buckskin Mine federal coal leases (map 2-1). It encompasses approximately 419 surface acres; approximately 182 acres (43%) overlap the existing Buckskin Mine permit area. The proposed tract is the area from which coal would be mined under the Proposed Action; the area within approximately 0.25 mile north and west of the tract would be used for activities to support mining in the tract. The legal description of the proposed tract is provided in table 2-1. The land description and acreage are based on the BLM Status of Public Domain Mineral Titles (BLM 2007a and 2008c). The entire surface of the proposed tract is privately owned by individuals or companies, while most of the subsurface minerals (all of the coal and the majority of oil and gas reserves) are federally owned. This results in a split estate situation. The BLM has developed a policy to address the split estate issue, which applies to situations where the surface rights are in private ownership and the rights to development of the mineral resources are publicly held and managed by the federal government.

Table 2-1. Legal Description of the Proposed Tract

Campbell County, Wyoming, Sixth Principal Meridian Township 52 North, Range 72 West		Acres
Section 19:	Lot 5 (W ½)	20.71
	Lot 6	41.42
	Lot 7	42.45
	Lot 10	42.31
	Lot 11	41.68
	Lot 12 (W ½)	20.84
	Lot 13 (W ½)	20.93
	Lot 14	41.75
	Lot 15	41.90
	Lot 18	41.97
	Lot 19	42.01
	Lot 20 (W ½)	21.07
Total Acres		**419.04**

Source: BLM Status of Public Domain Land and Mineral Titles (2007a and 2008c).

Kiewit estimates that the tract contains approximately 77.2 million tons of in-place federal coal reserves; however, not all of those coal reserves are currently considered mineable. According to 43 CFR 3480.0-5(23), the BLM defines minable coal as the reserve base that is commercially mineable. In other words, mineable coal includes all reserves that are legally and physically accessible, including the coal that would be left in place during the mining process, such as support pillars, fenders (i.e., catch benches), property barriers, or coal underlying public roads (because they could be relocated).

Much of the western boundary of the proposed tract is adjacent to Campbell County Road 23 (Collins Road). In accordance with SMCRA, and as specified under unsuitability criterion 3 (43 CFR 3461) (appendix B), lands within 100 feet of the outside line of the right-of-way of a public road are considered unsuitable for surface coal mining. Consequently, the coal reserves underlying the Collins Road, its right-of-way, and an associated 100-foot buffer zone cannot be accessed under current conditions.

An exception to this prohibition is included in the SMCRA regulations at Section 522(e)(4) and 30 CFR 761.11(d)(2). This exception can be applied if the Campbell County Board of Commissioners allows the public road to be relocated or closed after the following have occurred: a public notice has been issued, an opportunity for a public hearing has been provided, and a finding that the interests of the affected public and landowners will be protected has been issued (30 CFR 761.11[d]). If Kiewit were to obtain approval from the commissioners to move the Collins Road, the exception to the prohibition on mining within its right-of-way and buffer zone could be applied and the unsuitability determination could be reconsidered. In that case, Kiewit would be able to recover the coal underlying the county road and its associated buffer zones. If Kiewit were to not seek or obtain approval to move or close the road, a stipulation would be attached to any new lease stating that no mine-related surface disturbance may be conducted in the portions of the lease within the road right-of-way and 100-foot buffer zone without proper authorization, and the associated federal coal reserves would remain unsuitable for mining and would not be recovered. Neither the applicant nor the Campbell County Board of Commissioners has submitted a proposal to move this road, and Kiewit does not anticipate pursuing that option.

Kiewit estimates that approximately 17.1 million tons of mineable coal underlies the Collins Road and its 100-foot buffer zone within the proposed tract. Therefore, of the 77.2 million tons of in-place federal coal reserves in the proposed tract, Kiewit estimates that approximately 60.1 million tons of mineable coal are currently accessible under criteria 3. Although it may not be recovered as part of the Proposed Action, the coal underlying the road and its buffer area is still considered for leasing because those reserves could be mined under the exception described above. Including this coal in the lease would also allow for maximum recovery of all the mineable coal adjacent to, but outside of, the 100-foot buffer zone, even if the road is not relocated.

reserves are defined in 43 CFR 3480.0-5(32) as the minable reserve base excluding all coal that would be left in place during the mining process, even though they might be physically accessible (i.e., mineable). Recoverable coal represents reserves that can be mined economically and excludes areas defined as unsuitable for mining (e.g., in road rights-of-way that are not relocated) as well as the coal that is left behind as support pillars and similar structures, or unavoidably lost through cleaning, loading, and hauling (e.g., spillage), and spontaneous natural fires.

The BLM independently evaluates the volume and average quality of the coal resources included in proposed LBA tracts as part of the fair market value determination process. The agency's estimate of the mineable federal coal reserves included in the proposed tract may not agree precisely with the mineable coal reserve and coal quality estimates provided by the applicant. However, the BLM estimate would be published in the official notice if the tract is offered for sale.

Under its currently approved mining plan, the Buckskin Mine would retrieve its remaining 344.3 million tons of recoverable coal reserves in approximately 14 years, beginning in January 2009. The mine's current air quality permit as approved by the WDEQ allows mining of as much as 42 million tons of coal per year. Annual production averaged 20.6 million tons from 2001 through 2008, with a maximum of 25.3 million tons in any single year (Buckskin Mining Company 2002, 2003, 2004, 2005, 2006, 2007, 2008, and 2009). Under the Proposed Action, Kiewit estimates that the life of the mine would be extended by an additional two years, with a continued average production rate of 25 million tons per year. Additional details about existing coal reserves and tons mined to date are provided in section 1.1.3.1.

2.2.1.2 Mine Facilities and Employees

Under the Proposed Action, the recovery of additional federal coal reserves would use the existing mine facilities and employees described under section 1.1.3.2. The Proposed Action would not require additional facilities or employees.

2.2.1.3 Mining Methods and Activities

Under the Proposed Action, coal would continue to be produced at the Buckskin Mine from the Anderson and Canyon coal seams, and current production methods would be the same as those described under section 1.1.3.3.

The design of the Buckskin Mine seeks to confine disturbance to the active mine blocks. Before any surface disturbance or other mine-related activities would begin in the proposed tract, support infrastructure such as roads, power lines, gas pipelines, and flood- and sediment-control features would be built or relocated, as needed; no public roads are currently being considered for construction or relocation. Topsoil and overburden removal is accomplished using a variety of suitable heavy equipment. Whenever possible, topsoil would be hauled directly to a reclamation area and overburden to open pits; however, if scheduling conflicts arise, they would be temporarily stockpiled in separate areas and topsoil piles would be seeded immediately to

prevent erosion. Overburden and coal removal have been and would continue to be conducted using blasting and truck/shovel fleets to facilitate efficient excavation.

2.2.1.4 Reclamation Activities

Reclamation activities under the Proposed Action would be consistent with those currently in use at the Buckskin Mine, described in section 1.1.3.4.

Mined-out areas would be reclaimed according to an approved postmine plan. Any affected streams would be reclaimed to follow premine drainage patterns (section 3.5). In-channel stockponds and playas (shallow topographic depressions) would be replaced to provide livestock and wildlife watering sources. All postmining topography, including reconstructed drainages, must be approved by the WDEQ. After mining, the land is reclaimed to support the premining uses described in section 1.1.3.1. Oil and gas wells, pipelines, and utility easements are reestablished as required.

All reclaimed areas are monitored for a minimum of 10 years to evaluate the success of vegetation growth and the establishment of a variety of native plant species prior to the final (Phase III) release of the reclamation bond. Other parameters, such as successful use of reclaimed areas by domestic livestock and wildlife, also must be demonstrated before Phase III bond release is achieved, as described in section 1.1.3.4.

2.2.2 Alternative 1 (No Action)

Under Alternative 1, the No Action Alternative, Kiewit's application to lease the coal included in the proposed tract would be rejected: federal coal reserves adjacent to the existing Buckskin Mine would not be offered for competitive sale, and the additional coal would not be mined.

For the purposes of this EIS, Alternative 1 assumes that the federal coal reserves in the proposed tract adjacent to the Buckskin Mine would not be mined in the foreseeable future. However, selection of this alternative would not preclude Kiewit or another company from submitting a future lease application for these coal reserves. These coal reserves could be leased as a maintenance tract while the Buckskin Mine is in operation. If it is not leased while the mine is active, it may or may not be leased in the future. The proposed tract evaluated in this EIS does not include enough coal reserves to justify starting a new mine (section 2.3.1); however, they could be combined with unleased federal coal reserves to the west and north to create a larger tract, which could be mined by a new operation in the future.

Under Alternative 1, average annual production would continue as described under section 1.3.1.1;

- mine facilities and employees would be the same as described under section 1.1.3.2;

2.2.3 Alternative 2 (BLM Preferred Alternative)

The BLM has identified Alternative 2 as its Preferred Alternative for the final EIS. Under that alternative, the BLM is considering a tract configuration that is larger than both Kiewit's proposed tract and original (2006) tract, but smaller than the BLM study area (map 2-2). The legal descriptions of the BLM study area and the tract under consideration by the BLM are provided in table 2-2 and table 2-3, respectively. As described in section 2.0, the BLM will define the final tract delineation in the ROD based on lands within the BLM study area. The final tract configuration could be smaller or larger than the proposed tract. The final tract configuration could include part or all of the BLM study area. The tract will be considered to be technically, environmentally and economically in the public's best interest. Because the final tract configuration will be within the BLM study area, and the entire study area was analyzed in this EIS, no further discussion of Kiewit's original (2006) tract or the tract under consideration by the BLM will be included in this EIS beyond table 2-3.

Alternative 2 also assumes that Kiewit would be the successful bidder, and would incorporate a tract configuration other than Kiewit's proposal into its existing mine operations. Alternative 2 would not expand operations at the Buckskin Mine, but would maintain current levels of production, described in section 1.1.3.1, for up to six years beyond the current life-of-mine estimate.

2.2.3.1 Description of the BLM Study Area and Tract under Consideration by the BLM

The BLM study area extends north and west of the proposed tract to encompass approximately 1,883 acres (map 2-1). Approximately 618 acres (33%) of the BLM study area overlap the existing mine permit area. The legal description of the BLM study area is provided in table 2-2. Under this alternative, mining would occur in an alternative tract configuration within the BLM study area; the area within approximately 0.25 mile north and west of the alternative tract configuration would be used for activities to support mining in the tract.

The tract under consideration by the BLM extends north and west of the proposed tract, and encompasses approximately 1,568 acres. The legal description of this tract is provided in table 2-3. As with other configurations, the area within approximately 0.25 mile north and west of the tract under consideration by the BLM would be used for activities to support mining in that tract. The tract under consideration by the BLM was analyzed in the final EIS as part of the larger BLM study area; therefore, that tract is not discussed separately beyond table 2-3.

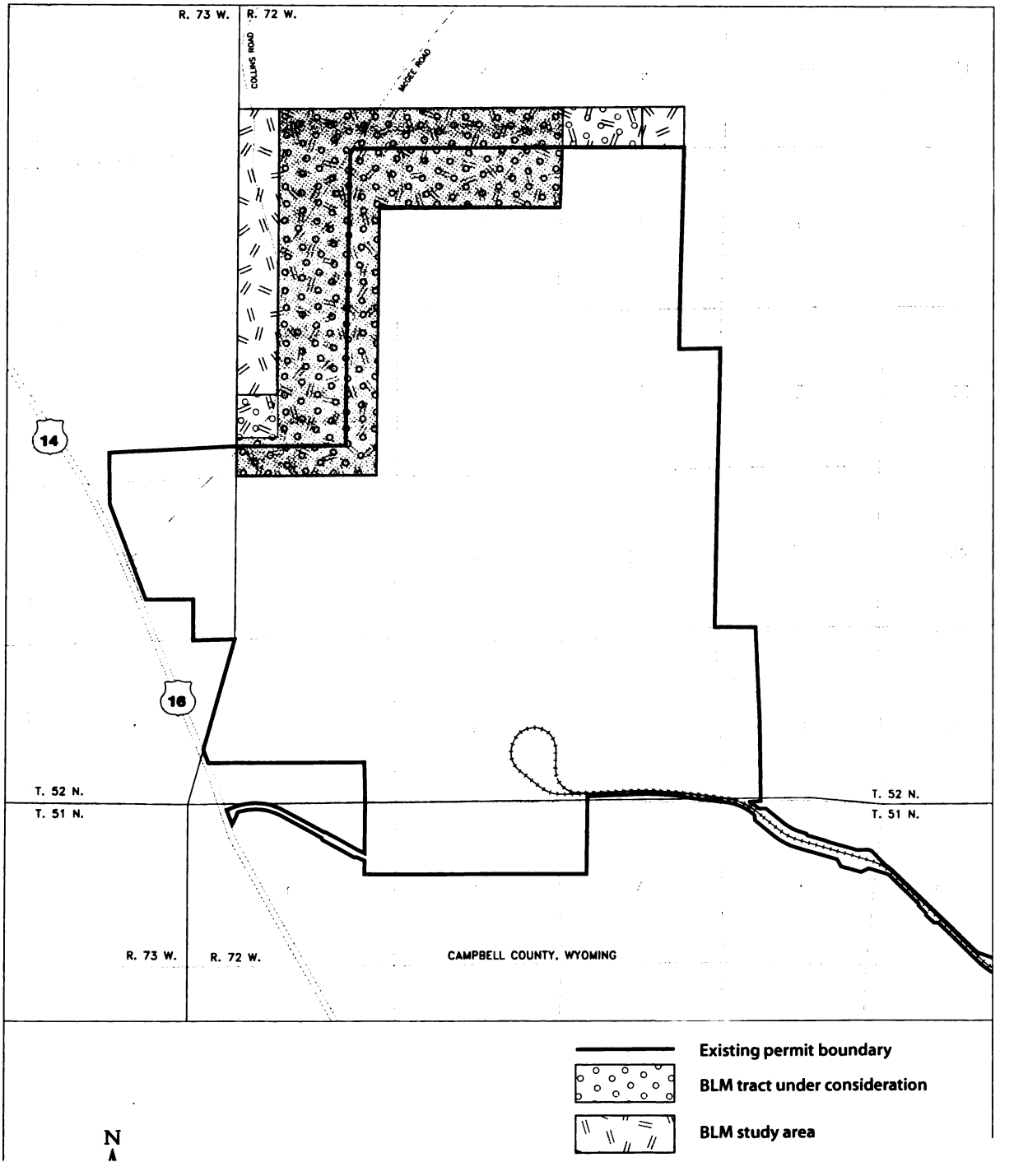


Table 2-2. Legal Description of the BLM Study Area

Campbell County, Wyoming, Sixth Principal Meridian Township 52 North, Range 72 West	Acres
Section 7: Lots 17 through 20	166.91
Section 8: Lots 13 through 16	162.00
Section 9: Lots 13 through 15	120.58
Section 17: Lots 1 through 4, 5 (N. ½), 6 (N. ½), 7 (N. ½), and 8 (N. ½)	247.39
Section 18: Lots 5 through 11, 12 (N. ½, SW. ¼), 13 (W. ½), 14 through19, and 20 (W. ½)	612.95
Section 19: Lots 5 (W. ½), 6 through 11, 12 (W. ½), 13 (W. ½), 14 through 19, and 20 (W. ½)	573.27
Total Acres	**1,883.10**

BLM = U.S. Bureau of Land Management
Source: BLM Status of Public Domain Land and Mineral Titles (2007a and 2008c).

Table 2-3. Legal Description of the Tract Under Consideration by the BLM

Campbell County, Wyoming, Sixth Principal Meridian Township 52 North, Range 72 West	Acres
Section 7: Lots 18 through 20	127.36
Section 8: Lots 13 through 16	162.00
Section 9: Lots 13 and 14	80.57
Section 17: Lots 1 through 4, 5 (N. ½), 6 (N. ½), 7 (N. ½), and 8 (N. ½)	247.39
Section 18: Lots 5 through 7, 10, 11, 12 (W. ½ & NE. ¼), 13 (W. ½), 14, 15, 18, 19, and 20 (W. ½)	455.33
Section 19: Lots 5 (W. ½), 6, 7, 10, 11, 12 (W. ½), 13 (W. ½), 14 through 19, and 20 (W. ½)	494.90
Total Acres	**1,567.55**

BLM = U.S. Bureau of Land Management
Source: BLM Status of Public Domain Land and Mineral Titles (2007a and 2008c).

The land descriptions and acreages shown in table 2-2 and table 2-3 are based on the same BLM master title plats and coal plats as those listed under section 2.2.1.1 for the Proposed Action. Surface ownership and ownership of oil and gas estates within the BLM study area are discussed in section 3.11. In addition to existing surface disturbance associated with the Buckskin Mine, the BLM study area includes small crop areas, two Campbell County roads (the Collins Road and Campbell County Road 73 [McGee Road]), several overhead electric transmission lines, oil and gas pipelines, and three residences. Only one of the three residences is currently occupied.

The coal underlying the Collins and McGee roads and their rights-of-way and associated 100-foot buffer zones have been determined unsuitable for surface coal mining in accordance with SMCRA and as specified under unsuitability criterion 3 (43 CFR 3461), unless the applicant pursues an exception to this prohibition by obtaining authorization to close or relocate one or both roads. Under the same unsuitability criterion, the land underlying the occupied residence, discussed above, is also considered unsuitable for mining. Surface disturbance on this land and a 300-foot buffer around it would be prohibited, unless Kiewit were to purchase the surface rights associated with the residence and its buffer zone.

Kiewit does not currently plan to pursue efforts to relocate either county road or acquire the surface rights to the land associated with the occupied residence; therefore, the company considers the lands west of both roads and around the occupied residence as inaccessible and operationally limited. Nevertheless, the coal underlying these features and their respective buffer areas must be considered for leasing by the BLM because those reserves could be mined under the exceptions for unsuitability criterion 3 described in section 2.2.1.1. Including these operationally limited coal reserves in the lease would also allow for maximum recovery of all adjacent mineable coal. Although the coal itself may not be recovered, topsoil stripping and other disturbance activities necessary to access previously permitted adjacent reserves would occur up to the edge of buffers associated with the county roads or occupied residence. If a lease is issued for lands under Alternative 2, a stipulation will be attached to the lease stating that no mining activity may be conducted within the areas currently identified as unsuitable for mining without proper authorization or acquisition of surface rights, as applicable.

Kiewit estimates that the BLM study area contains approximately 269.7 million tons of in-place coal, and considers approximately 149.7 million tons (56%) of it recoverable. Approximately 103.4 million tons (38%) of coal within the BLM study area would not be accessible (according to Kiewit's estimates) because of limitations associated with the occupied residence and public road rights-of-way and buffer zones discussed above. Kiewit estimates that the remaining 16.6 million tons (6%) of coal would be left in place as support pillars and similar structures, or unavoidably lost through spillage and spontaneous natural fires. As with the Proposed Action, the BLM would independently evaluate the volume and average quality of the coal resources included under Alternative 2 as part of the fair market value determination process. This estimate may not agree with the estimates provided by the applicant. Nevertheless, the BLM estimate would be published in the public notice if a tract is offered for sale.

2.2.3.2 Mine Facilities and Employees

Under Alternative 2, Kiewit estimates the life of the mine would be extended by up to six years with an average annual production rate of 25 million tons. Mine facilities and employees would be the same as those described in section 1.1.3.2 and under the Proposed Action.

2.2.3.3 Mining Methods and Activities

Mining methods and activities would be the same as those described in section 1.1.3.3 and under the Proposed Action.

2.3 Eliminated Alternatives

The following alternatives were considered in the initial phase of this EIS, but were eliminated from further analysis.

2.3.1 Alternative 3

Under this alternative, the BLM would hold a competitive, sealed-bid sale for the federal coal reserves included in the proposed tract or an alternative tract configuration. Alternative 3 assumes, however, that the successful bidder would be someone other than the applicant, and that this bidder would plan to open a new mine to develop these coal resources.

The environmental impacts of developing a new mine to recover the coal resources within the proposed tract or an alternative tract configuration would be greater than under either action alternative or the No Action Alternative due to the need for construction of new facilities and rail lines, increased employment requirements and their associated effects on the local socioeconomics, and the creation of additional sources of particulates (dust).

The BLM currently estimates that a tract would need to include as much as 500 to 600 million tons of in-place coal to attract a buyer interested in opening a new mine in the Wyoming PRB. This estimate is based on two primary assumptions. First, an operator would need to construct facilities capable of producing 30 million tons of coal per year to take advantage of the economies of scale offered by the coal deposits in the PRB. Second, 20 to 30 years of coal reserves would be needed to justify the expense of building those facilities. Given these assumptions, neither the proposed tract (approximately 77 million tons) nor the BLM study area (about 270 million tons) includes sufficient in-place coal resources to justify the costs of opening a new mine, though the coal reserves included in this EIS could be combined with unleased federal coal to the west and north to create a larger tract, which could be mined by a new future operation.

A company or companies acquiring this coal for a new stand-alone mine would require considerable initial capital investments, including the construction of new surface facilities (e.g., offices, shops, warehouses, processing facilities, loadout facilities, and rail spur), extensive baseline data collection, and development of new, detailed mining and reclamation plans (rather than simply amending existing plans). A new mine start would also require a large number of new employees, which may not be available from the mining sector workforce (which includes the oil and gas industry) considering the current strong demand for labor and low unemployment in Campbell County and surrounding counties in the PRB. In addition, a company or companies acquiring this coal for a new mine would have to compete for customers with established mines in a competitive market. Based on demand forecasting for the Wyoming PRB mines, existing mine capacity is sufficient to provide for expected coal demand through 2020 (BLM 2005b). While these factors do not mean that no new mines would open, it would be difficult for them to produce coal at a price competitive with the existing operations while also incurring the high capital and start-up costs associated with new facilities and operations.

The potential difficulty in obtaining an air quality permit is another factor that could discourage new mine starts in the Wyoming PRB. A new mine would constitute a new source of air pollutants. Under the WDEQ permitting program, anyone planning to construct, modify, or use a facility capable of emitting designated pollutants into the atmosphere must obtain an air quality permit prior to construction. Surface coal mines fall into this category. Air quality is discussed in detail in section 3.4.

To obtain a construction permit, an operator may be required to demonstrate that the proposed activities would not increase air pollutant levels above the state's 24-hour average annual standards for particulate matter measuring 10 micrometers or less in diameter (PM_{10}). These standards were established by Chapter 6 of the Wyoming Air Quality Standards and Regulations, and can be found on the Internet at http://deq.state.wy.us/aqd/standards.asp. The PRB did not experience any exceedances of these PM_{10} standards through 2000, but recorded an average of five per year from 2001 through 2007; additional details regarding exceedances at the Buckskin Mine are provided in section 3.4. Although many of the previous exceedances were attributed to high winds, concerns about future potential exceedances of the National Ambient Air Quality Standards (NAAQS) may make it more difficult for a company planning to open a new mine to demonstrate that those operations would not result in additional air pollution levels that are above annual Wyoming standards.

If a lease sale is held and the successful bidder is not the original applicant, the new operator would be required to submit a new permit application, including detailed mining, monitoring, mitigation, and reclamation plans (versus a simple amendment of current plans) to the WDEQ for review. The new operator would also be required to submit a Resource Recovery and Protection Plan to the BLM for review. Before a new mining operation could begin, this plan must be approved by the BLM, a mining permit must be approved by the WDEQ, and a Mineral Leasing Act mining plan must be approved by the Assistant Secretary of the Interior.

In view of these issues, the current economies of mining in the Powder River Federal Coal Region appear to make construction of a new mine economically unfeasible using coal reserves in the proposed tract or BLM study area. Therefore, this alternative is not analyzed further in this EIS.

2.3.2 Alternative 4

impacts from a new mine start would be expected to be greater than if the coal reserves were mined as an extension of an existing mine.

Delaying the lease sale would not guarantee that the BLM would receive a higher price during the initial bidding process, or a higher bonus bid or royalties and taxes once the lease is issued due to other reasons that may or may not be related to the quality and/or location of the coal reserves themselves. The price of coal and, thus, the rate of mining, is affected by various factors including, but not limited to, customer demand (sales) and transportation options. For example, coal prices were depressed in the early 2000s, which resulted in lower bid prices during that period. In other years, shipping constraints, combined with increased world energy demand and numerous natural disasters in other parts of the country, led to unusually large increases in coal prices.

The prices received for coal from the PRB have generally been increasing in recent years. If that trend continues, the fair market value of federal coal reserves could increase and a delayed sale would result in a higher lease bid, as well as higher bonus bid and royalty payments to the government when the lease is issued and coal is mined, respectively. This approach also would allow CBNG resources to be more completely recovered prior to mining. Likewise, if the fair market value of the coal reserves were to decrease, a delayed sale would bring lower initial and bonus bids as well as lower royalty, tax, and annual rental payments.

Royalty and tax payments are the largest revenue sources from new leases, but cannot be collected until the coal is permitted and mined; this process requires several years after the lease is issued. Therefore, the price of coal when it is mined (and essentially sold to the customer) affects royalty and tax payments. Higher coal prices result in greater royalty and tax payments, regardless of whether coal lessees have short- or long-term contracts with their customers. The reverse is true when coal prices decrease.

Other considerations include the value of making low-sulfur coal available now versus leaving mineable coal in place for future development, in anticipation of cleaner fuel sources being developed in the future. Continued leasing of low-sulfur coal from the PRB enables existing coal-fired power plants to more easily meet current CAA requirements until new technologies are developed to improve efficiency and reduce emissions. This approach provides a stable supply of power to meet increasing demand without a potentially significant increase in power costs for individuals and businesses, and meets current energy requirements while the new technologies are developed. If cleaner fuel sources are developed in the future, they could be phased in with less economic impact on the public. An economic analysis could be conducted to estimate the range of potential future economic benefits that would result from delaying the lease sale until coal prices rise. However, because it is impossible to predict with any certainty when or if those rates would increase, any projected benefits from delaying the lease sale would be speculation.

CBNG resources are currently being recovered from leases in and near the proposed tract and BLM study area. As of May 2008, 30 wells had been completed in the BLM study area and immediate vicinity (appendix E). Of those, 15 wells are currently producing and 3 have been shut in and may be re-instated for production in the future. Twelve other wells are no longer

producing, have been permanently abandoned, or have expired permits (Wyoming Oil and Gas Conservation Commission 2009). Additional information relative to conventional oil and gas and CBNG development in the proposed tract and immediately adjacent area is provided in section 3.3.2.

Several existing mechanisms can facilitate the continued recovery of these oil and gas resources prior to mining if the federal coal in the proposed tract or an alternative tract configuration is leased under the current timeline, as described below.

- The BLM can attach a Multiple Mineral Development stipulation to the lease. Such a stipulation would state that the BLM has the authority to withhold approval of coal mining operations that would interfere with the development of mineral leases issued prior to the coal lease.
- Mining the proposed tract or alternative tract configuration cannot occur until the coal lessee has a permit to mine the tract as approved by the WDEQ and a Mineral Leasing Act mining plan approved by the Secretary of the Interior. Before that mining plan can be approved, the BLM must approve the Resource Recovery and Protection Plan for mining the tract. Prior to approving the plan, the BLM can review the status of CBNG development in the final tract configuration and the mining sequence proposed by the coal lessee. The WDEQ permit approval process generally takes several years to complete. This interval would allow additional time for CBNG resources to be recovered from the leased tract.
- The BLM has a policy in place regarding conflicts between CBNG and coal recovery. This policy directs the BLM decision makers to optimize the recovery of both resources and to ensure that the public receives a reasonable return (BLM 2006a).

As described previously, rental and royalty provisions from the proposed tract or an alternative tract configuration would benefit the United States, if coal prices increased by the time mining began. Given the mechanisms currently in place, a large portion of the economically recoverable CBNG resources in the area would be expected to be recovered after a lease is issued and before mining occurred. The environmental impacts of mining the coal later as part of an existing mine would be expected to be similar in nature and essentially equal in magnitude to the action alternatives discussed in section 2.2.1 and section 2.2.3. If a new mine is required to mine the coal, the environmental impacts would be expected to be greater than if each tract were mined as an extension of an existing mine.

2.4 Regulatory Compliance, Mitigation, and Monitoring

In general, the levels of mitigation and monitoring required for surface coal mining by the SMCRA and Wyoming state law are more rigorous and extensive than those required for other surface disturbing activities. Those regulations and laws require surface coal mines to collect a wide range of detailed baseline information prior to mining, and implement extensive reclamation and/or mitigation measures and monitoring programs during and after mining. The

currently approved permit to conduct mining operations for the Buckskin Mine (i.e., the No Action Alternative) includes these requirements.

Required mitigation and monitoring programs are also considered to be part of the action alternatives considered in this EIS. These data collection requirements, monitoring commitments, and mitigation plans would be amended to include mining operations in the proposed tract or alternative tract configuration if they are leased and permitted for mining. The major mitigation and monitoring measures that are required by state or federal regulation are summarized in table 2-4. Specific information about some of these measures (including their results at the Buckskin Mine) is included in chapter 3. If impacts are identified during the leasing process that are not addressed by existing required mitigation measures, the BLM can require additional measures in the form of stipulations on the new lease within the limits of its regulatory authority. The mining and reclamation plan would also have to be revised to address any new concerns that are not included under existing procedures; that revised plan would have to be approved for the final tract configuration before any mining operations could be conducted, regardless of who acquires the tract.

Table 2-4. Regulatory Compliance, Mitigation, and Monitoring Measures for Surface Coal Mining Operations Legally Required for All Alternatives

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State, or Federal Law[a]	Monitoring[a]
Topography and Physiography	▪ Reclaim to approximate original contour or other approved topographic configuration	▪ WDEQ checks as-built vs. approved topography with each annual report
Geology and Minerals	▪ Identify and selectively place or mix chemically or physically unsuitable overburden materials to minimize adverse effects on vegetation or groundwater	▪ WDEQ requires monitoring in advance of mining to detect unsuitable overburden
Soil	▪ Salvage soil suitable to support plant growth for use in reclamation ▪ Protect soil stockpiles from disturbance and erosional influences ▪ Selectively place at least 4 feet of suitable overburden on the graded backfill surface below replaced topsoil to meet guidelines for vegetation root zones	▪ Monitoring vegetation growth in reclaimed areas to determine need for soil amendments ▪ Sampling regraded overburden for compliance with root zone criteria
Air Quality	▪ Conduct dispersion modeling of mining plans for annual average particulate pollution impacts on ambient air ▪ Implement particulate pollution control technologies ▪ Implement work practices designed to minimize fugitive particulate emissions ▪ Use EPA or state-mandated best available control technology, including: – Fabric filtration or wet scrubbing of coal storage silo and conveyor vents – Watering or using chemical dust suppression on haul roads and exposed soils – Containing truck dumps and primary crushers Covering conveyors	▪ On-site air quality monitoring for PM_{10} and/or TSP ▪ Off-site ambient monitoring for PM_{10} and/or TSP ▪ On-site compliance inspections

Table 2-4. Continued

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State, or Federal Law[a]	Monitoring[a]
	Promptly revegetating exposed soils – High-efficiency baghouse dust collection systems or passive enclosure control systems or atomizers/foggers on the crusher, conveyor transfer, storage bin and train loadout, meeting a standard of 0.01 grains per dry standard cubic foot of exit volume – Watering active work areas – Reclamation planning to minimize surface disturbances subject to wind erosion – Paving access roads – Haul truck speed limits – Limited material drop heights for shovels and draglines	▪
	▪ Follow voluntary and required measures to avoid exposing the public to NO_2 from blasting clouds, including: – Phoning neighbors and workers to notify them prior to blasting – Monitoring weather and atmospheric conditions prior to decisions to blast – Timing blasts to avoid temperature inversions and to minimize inconvenience to neighbors – Closing public roads when appropriate to protect the public – Minimizing blast sizes – Posting signs on major public roads	▪
Surface Water	▪ Build and maintain sediment-control ponds or other devices during mining ▪ Reclaim drainages to approximate premining drainage patterns ▪ Reclaim stockponds and playas to approximate premine characteristics	▪ Monitoring storage capacity in sediment ponds ▪ Monitoring quality of discharges ▪ Monitoring streamflow and water quality
Groundwater Quantity	▪ Evaluate cumulative impacts on water quantity associated with proposed mining ▪ Replace existing water rights that are interrupted, discontinued, or diminished by mining with water of equivalent quantity	▪ Monitoring wells ▪ track water levels in overburden, coal, interburden, underburden, and backfill
Groundwater Quality	▪ Evaluate cumulative impacts on water quality associated with proposed mining ▪ Replace existing water rights that are interrupted, discontinued, or diminished by mining with water of equivalent quality	▪ Monitoring wells ▪ track water quality in overburden, coal, interburden, underburden, and backfill
Alluvial Valley Floors	▪ Identify all AVFs that would be affected by mining ▪ Comply with WDEQ determination of significance to agriculture of all identified AVFs affected by mining ▪ Protect downstream AVFs during mining ▪ Restore essential hydrologic function of all AVFs affected by mining	▪ Monitoring to determine restoration of essential hydrologic functions of any declared AVF
Wetlands	▪ Identify all wetlands that would be affected by mining ▪ Comply with U.S. Army Corps of Engineers identification of jurisdictional wetlands ▪ Replace all jurisdictional wetlands that would be disturbed by mining ▪ Replace functional wetlands as required by surface managing agency, surface landowner, or WDEQ	▪ Monitoring reclaimed wetlands using same procedures used to identify premining jurisdictional wetlands

Table 2-4. Continued

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State, or Federal Law[a]	Monitoring[a]
Vegetation	▪ Revegetate reclaimed areas according to a comprehensive revegetation plan using approved permanent reclamation seed mixtures consisting predominantly of species native to the area ▪ Reclaim 20% of disturbed area with native shrubs at a density of one per square meter ▪ Control erosion on reclaimed lands prior to seeding with final seed mixture using mulching, cover crops, or other approved measures ▪ Chemically and mechanically control weed infestation ▪ Use direct hauling for topsoil ▪ Selectively plant shrubs in riparian areas ▪ Plant sagebrush ▪ Create depressions and rock piles ▪ Use special planting procedures around rock piles ▪ Post reclamation bond covering the cost of reclamation	▪ Monitoring revegetation growth and diversity until release of final reclamation bond (minimum 10 years) ▪ Monitoring erosion to determine need for corrective action during establishment of vegetation ▪ Use of controlled grazing during revegetation evaluation to determine suitability for postmining land uses
Wildlife and Sensitive Species	▪ Reclaim to approximate premine topography to the maximum extent possible ▪ Plant a diverse mixture of grasses, forbs, and shrubs in configurations beneficial to wildlife ▪ Design fences to permit wildlife passage ▪ Raptor-proof power transmission poles per current APLIC recommendations ▪ Use raptor-safe power lines per current APLIC recommendations ▪ Create artificial raptor nest sites ▪ Increase habitat diversity by creating rock clusters and shallow depressions on reclaimed land ▪ Plant cottonwoods along reclaimed drainages ▪ Reclaim drainages, wetlands, and AVFs disturbed by mining ▪ Reduce vehicle speed limits to minimize mortality ▪ Instruct employees not to harass or disturb wildlife ▪ Follow USFWS approved avian monitoring and mitigation plans ▪ Avoid disturbance near bald eagle winter roost sites ▪ Reclaim bald eagle perching and foraging areas disturbed by mining ▪ Reclaim sage-grouse and mountain plover habitat disturbed by mining ▪ Survey for sage-grouse, mountain plovers, and black-tailed prairie dogs	▪ Baseline and annual wildlife monitoring surveys ▪ Monitoring for Migratory Bird Species of Management Concern in Wyoming
Threatened, Endangered, Proposed, and Candidate Species	▪ Survey for Ute ladies'-tresses and blowout penstemon ▪ Comply with USFWS block clearance from black-footed ferret surveys in project area ▪ Same as Wildlife and Sensitive Species above	▪ Baseline and annual wildlife monitoring surveys
Land Use	▪ Reclaim mined areas for historic uses (grazing and wildlife)	▪ Monitoring of controlled grazing prior to bond release evaluation
Cultural Resources	▪ Conduct predisturbance Class I and III surveys to identify cultural properties on all state and federal lands, and on private lands affected by federal undertakings ▪ Consult with SHPO to evaluate eligibility of cultural properties for the NRHP ▪ Avoid or recover data from significant cultural properties identified by surveys, according to an approved plan ▪ Notify appropriate agency personnel if historic or prehistoric materials are uncovered during mining operations ▪ Instruct employees of the importance of and regulatory obligations to protect cultural resources	▪ Monitoring mining activities during topsoil stripping ▪ Ceasing activities and notifying authorities if unidentified sites are encountered during topsoil removal

Table 2-4. Continued

Resource	Regulatory Compliance or Mitigation Required by Stipulations, State, or Federal Law[a]	Monitoring[a]
Native American Concerns	▪ Notify Native American tribes with known interest in this area of leasing action and requesting help in identifying potentially significant religious or cultural sites	▪ No specific monitoring program
Paleontological Resources	▪ Conduct predisturbance surveys to identify paleontological resources on all state and federal lands, and on private lands affected by federal undertakings ▪ Notify appropriate agency personnel if potentially significant paleontological sites are discovered during mining ▪ Instruct employees of the importance of and regulatory obligations to protect paleontological resources	▪ Ceasing activities and notifying authorities if unidentified resources are encountered during topsoil removal
Visual Resources	▪ Reclaim postmining landscapes to approximate original contours and replanting with native species	▪ No specific monitoring program; land contours and plant communities monitored as part of topography and vegetation requirements, respectively
Noise	▪ Protect employees from hearing loss	▪ Mine Safety and Health Administration inspections
Transportation Facilities	▪ Relocate existing pipelines, if necessary, in accordance with specific agreement between pipeline owner and coal lessee	▪ Monitoring conducted by pipeline company per WDEQ requirements
Socioeconomics	▪ Pay royalty and taxes as required by federal, state, and local regulations. No mitigation measures are proposed	▪ Surveying and reporting to document volume of coal removed
Hazardous and Solid Waste	▪ Dispose of solid waste and sewage according to approved plans ▪ Store and recycle waste oil ▪ Maintain files containing Material Safety Data Sheets for all chemicals, compounds, and/or substances used during course of mining ▪ Ensure that all production, use, storage, transport, and disposal of hazardous materials are in accordance with applicable existing or hereafter promulgated federal, state, and government requirements ▪ Comply with emergency reporting requirements for releases of hazardous materials as established under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended ▪ Prepare and implement spill prevention control and countermeasure plans, spill response plans, inventories of hazardous chemical categories pursuant to section 312 of Superfund Amendments and Reauthorization Act, as amended ▪ Prepare emergency response plans.	▪ No specific monitoring other than required by these other regulations and response plans

WDEQ = Wyoming Department of Environmental Quality; PM_{10} = particulate matter of 10 micrometers or less in diameter; TSP = total suspended particulates; EPA = Environmental Protection Agency; NO_2 = nitrogen dioxide; AVF = alluvial valley floors; USFWS = U.S. Fish and Wildlife Service; SHPO = State Historic Preservation Office; NRHP = National Register of Historic Places.

[a] These requirements, reclamation and mitigation plans, and monitoring plans are required by the Surface Mining Control and Reclamation Act and Wyoming state law. They are already in place for the existing Buckskin Mine in its current approved WDEQ mining and reclamation plan (the No Action Alternative). Under the Proposed Action and Alternative 2, these requirements, reclamation and mitigation plans, and monitoring plans would be addressed in a mining plan revision for the additional leased tract; they would be approved by appropriate state and federal agencies before mining could occur.

Source: WDEQ Rules and Regulations.

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

2.5 Summary of Coal Production and Disturbance under the Proposed Action and Alternatives

The decision-making process for public lands and/or federal minerals in Wyoming is conducted in compliance with NEPA, which requires all federal agencies to:

- involve the interested public in their decision-making process;
- consider reasonable alternatives to the proposed actions;
- develop measures to mitigate environmental impacts; and
- prepare environmental documents that disclose the impacts of the proposed actions and alternatives.

Table 2-5 compares coal reserves, lease and permit areas, production, mine life, and revenues for the Buckskin Mine and under existing conditions and under the Proposed Action and alternatives analyzed in this EIS. These figures were based on an average production rate of 25 million tons per year, which is the current projected life-of-mine rate.

Detailed discussions of the direct and indirect environmental impacts under the Proposed Action and analyzed alternatives are provided in chapter 3; a summary of those impacts is provided in table 3.0-2. Cumulative environmental impacts, based on upper and lower estimates for future coal production in the region, are discussed in chapter 4, and a summary of those impacts is provided in table 4-41. The Proposed Action and alternatives for the Hay Creek II EIS fall within those projections. As described in section 2.3, Alternatives 3 and 4 were considered in the initial phase of this EIS, but were eliminated from further analysis because they were not feasible or were not substantially different from other analyzed alternatives, respectively.

Table 2-5. Comparison of Coal Reserves, Lease and Permit Areas, Production, Mine Life, and Revenues by Alternative

Item	Existing Buckskin Mine Permit Area	Additional Under		
		Alternative 1 (No Action)	Proposed Action	Alternative 2
In-Place Coal (as of 12-31-08)	460.9 mmt	0	77.2 mmt[a]	269.7 mmt[b]
Accessible Mineable Coal (as of 12-31-08)[c]	361.9 mmt	0	60.1 mmt[a]	166.3 mmt[b]
Recoverable Coal (as of 12-31-08)[d]	344.3 mmt	0	54.1 mmt[a]	149.7 mmt[b]
% Increase in Estimated Recoverable Coal (as of 12/31/08)[d]	—	0	15.7%	43.5%
Coal Lease Area	6,438.2 acres[e]	0	419.0 acres	1,883.1 acres
Permit Area (as of 12/31/08)	8,011.5 acres	0	478.0 acres	2,191.6 acres
Average Annual Post-2008 Coal Production	25 mmt	0	0	0
Remaining Life of Mine (Post-2008)	14 years	0	2 years	up to 6 years
Average Number of Employees	350	0	0	0
Total Projected State and Local Revenues (Post-2008)[f]	$563.6million	0	$90.6–$108.8 million	$250.2–$300.4 million
Total Projected Federal Revenues (Post-2008)[g]	$417.0 million	0	$69.2–$87.3 million	$191.0–$241.1 million

mmt = million tons

[a] Based on the entire proposed tract, including its overlap with the existing Buckskin Mine permit area.

[b] Based on the entire BLM study area, including its overlap with the existing Buckskin Mine permit area.

[c] Maximum estimate; does not include coal reserves that are inaccessible due to criteria 3 (i.e., reserves beneath the occupied residence and associated 300-foot buffer zone; or the public road rights-of-way [Collins and McGee roads], their associated 100-foot buffer zones, and other operationally limited lands between the two roads).

[d] Assumes a recovery rate of 95% for coal in the Canyon seam and a 90% for all other coal reserves; does not include coal left behind as support pillars and similar structures, or unavoidably lost through spillage and spontaneous natural fires during normal mining operations..

[e] Includes federal and state coal leases currently held by the Buckskin Mining Company.

[f] Revenues to the State of Wyoming and local governments include severance taxes; property and production taxes (ad valorem); sales and use taxes; and Wyoming's share of federal royalty payments, bonus bids, annual rental payments, and Abandoned Mine Land fees. State revenues are based on an assumed price of $7.85 per ton of "recoverable coal," federal royalty of 12.5% of the value less 51% federal share, plus $0.315 per ton for Abandoned Mine Land fees on assumed 25% state share, plus bonus payments of between $0.30 and $0.97 per ton of LBA leased coal per ton (based on average of six LBAs in 2004 and 2005) times the tonnage of recoverable coal times a 50% state share, plus $0.07 per ton estimated sales and use taxes, plus $0.33 per ton estimate for ad valorem taxes, plus $0.415 per ton in severance taxes. Only the sales and use taxes paid directly by the mine are considered (i.e., taxes generated by vendors and suppliers and by consumer expenditure supported directly and indirectly by the mine are not included. These figures could change based on the outcome of recent legislation that changed the percentage of distribution to states.

[g] Federal revenues are based on an assumed price of $7.85 per ton, federal royalty of 12.5% times 51% share, plus $0.315 per ton for Abandoned Mine Land fees times an assumed 75% federal share, plus black lung tax of $0.00261 per ton, plus bonus payments of between $0.30 and $0.97 per ton of LBA leased coal (based on the range of the six LBA sales in 2004 and 2005) times tonnage of recoverable coal minus a 50% federal share. These figures could change based on the outcome of recent legislation that changed the percentage of distribution to states.