

APPENDIX E

**BIOLOGICAL ASSESSMENTS
FOR THE SOUTH GILLETTE AREA COAL
LEASE APPLICATIONS EIS,**

**BELLE AYR NORTH LBA TRACT
WEST COAL CREEK LBA TRACT
CABALLO WEST LBA TRACT
MAYSDORF II LBA TRACT**

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INTRODUCTION

Between 2004 and 2006, operators of four coal mines in Campbell County, Wyoming applied for four tracts of federal coal as maintenance leases under the Leasing on Application regulations at 43 CFD 3425. The environmental impacts of leasing these four lease by application (LBA) tracts are being evaluated in one environmental impact statement (EIS), the South Gillette Area Coal (SGAC) EIS. The four tracts, which are shown in Figure E-1, and applicant mines are:

- Belle Ayr North LBA tract adjacent to and north of the Belle Ayr Mine;
- West Coal Creek LBA tract adjacent to and west of the Coal Creek Mine;
- Caballo West LBA tract adjacent to and southwest of the Caballo Mine; and
- Maysdorf II LBA tract adjacent to and west of the Cordero Rojo Complex.

The purpose of this Biological Assessment is to provide information about the potential effects that leasing the Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts would have on federally listed threatened or endangered (T&E) species. T&E species are managed under the authority of the Endangered Species Act of 1973 (PL 93-205, as amended). The Endangered Species Act requires Federal agencies to ensure that all actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any federally listed species or result in the destruction or adverse modification of their critical habitat. Bureau of Land Management (BLM) does not authorize mining by issuing a lease for federal coal, but the impacts of mining the coal are considered at the leasing stage because they are a logical consequence of issuing a lease.

This biological assessment was prepared to disclose the possible effects to T&E species (plant and animal) that are known to be present or that may be present within the area influenced by the Proposed Action and the alternative to the Proposed Action being evaluated by the BLM. It was prepared in accordance with Section 7 of the Endangered Species Act.

Biological assessment objectives are:

1. To comply with the requirements of the Endangered Species Act that actions of federal agencies not jeopardize or adversely modify critical habitat of federally listed species.
2. To provide a process and standard by which to ensure that threatened or endangered species receive full consideration in the decision making process.

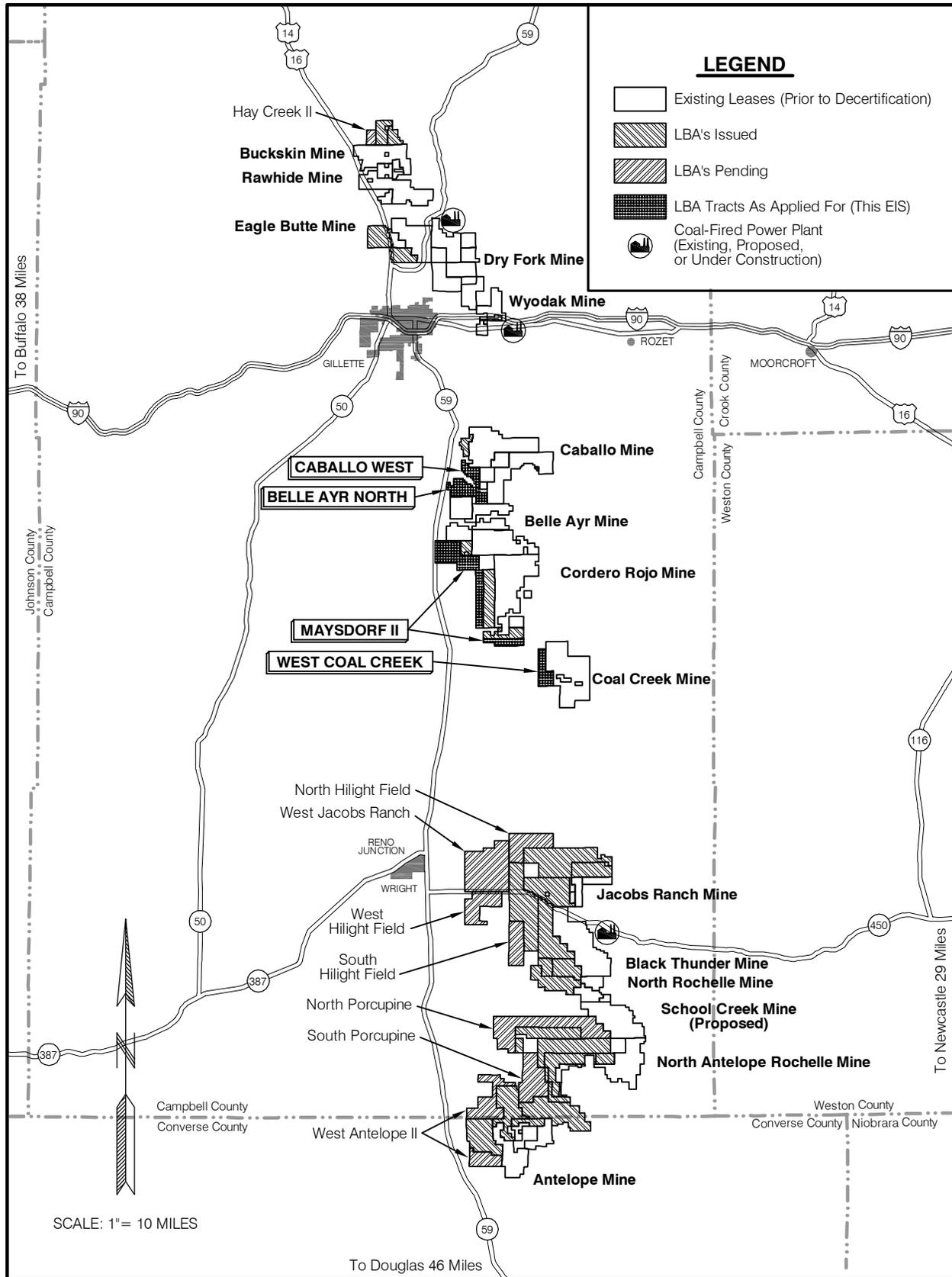


Figure E-1. General Location Map with Federal Coal Leases and LBA Tracts.

If a decision is made to hold competitive lease sales for the Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts and if there is a successful bidder at a sale, a lease would be issued for the tract of federal coal as applied for. The tracts offered for lease would be subject to standard and special lease stipulations developed for the Wyoming Powder River Basin (PRB). The stipulations that would be attached to a lease for the four tracts are listed in appendix D of the SGAC EIS document. The following stipulation relating to T&E species is one of the special stipulations developed for the Wyoming PRB:

THREATENED, ENDANGERED, CANDIDATE, or OTHER SPECIAL STATUS PLANT and ANIMAL SPECIES - *The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened or endangered under the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or that have other special status. The Authorized Officer may recommend modifications to exploration and development proposals to further conservation and management objectives or to avoid activity that will contribute to a need to list such species or their habitat or to comply with any biological opinion issued by the Fish and Wildlife Service for the Proposed Action. The Authorized Officer will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act. The Authorized Officer may require modifications to, or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species, or result in the destruction or adverse modification of designated or proposed critical habitat.*

The lessee shall comply with instructions from the Authorized Officer of the surface managing agency (BLM, if the surface is private) for ground disturbing activities associated with coal exploration on federal coal leases prior to approval of a mining and reclamation permit or outside an approved mining and reclamation permit area. The lessee shall comply with instructions from the Authorized Officer of the Office of Surface Mining Reclamation and Enforcement, or his designated representative, for all ground disturbing activities taking place within an approved mining and reclamation permit area or associated with such a permit.

It is assumed that an area larger than a tract would have to be disturbed in order to recover all of the coal in the tract. The disturbances outside of a tract would be due to activities like overstripping, matching undisturbed topography, and construction of flood control and sediment control structures.

The coal mining unsuitability criteria listed in the federal coal management regulations at 43 CFR 3461.5 were applied to high to moderate coal development potential lands in the Wyoming PRB. As indicated in sections 1.1 and 1.5, some of the coal in the six tracts is overlain by rights of way (ROWS) for a state highway or county roads, or portions of the BNSF and UP railroad ROW and has been determined to be unsuitable for mining under Unsuitability Criterion 2 and/or Unsuitability Criterion 3 (43 CFR 3461.5). The Surface

Mining Control and Reclamation Act of 1977 (SMCRA) prohibits surface mining operations on lands within 100 feet of the outside line of the ROW for a public road (SMCRA Section 522(e)(4) and 30 CFR 761.11(d)). There is an exception to this prohibition in the regulations at SMCRA Section 522(e)(4) and 30 CFR 761.11(d)(2), which can be applied if the appropriate road authority (Wyoming Department of Transportation (WYDOT) for state highways and Campbell County Board of Commissioners for county roads) allows a public 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. Although the federal coal underlying the railroad and road ROWs and associated buffer zones may not be mined, it is included in a tract because it would allow maximum recovery of the mineable coal adjacent to but outside of the railroad and road ROWs and associated buffer zones and comply with the coal leasing regulations that do not allow leasing of less than 10-acre aliquot parts.

Under the Proposed Actions for each tract, it is assumed that the LBA tract would be developed as maintenance lease to extend the life of the adjacent existing applicant mine. As a result, under the Proposed Actions, the coal included in the tract would be mined by existing employees using existing facilities and roads.

CONSULTATION TO DATE

The existing applicant mines and Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts are included in the area determined to be “acceptable for further consideration for leasing” as part of the coal screening process. The coal screening process is a four part process that includes application of the coal unsuitability criteria, which are defined in 43 CFR 3461.5. BLM has applied these coal screens to federal coal lands in Campbell County several times, starting in the early 1980s. Most recently, in 1993, BLM began the process of reapplying these screens to federal coal lands in Campbell, Converse, and Sheridan Counties. The results of this analysis were included as Appendix D of the 2001 *Approved Resource Management Plan for Public Lands Administered by the BLM Buffalo Field Office* (BLM 2001), which can be viewed on the Wyoming BLM website at <http://www.wy.blm.gov> in the NEPA documents section. Consultation with the U.S. Fish and Wildlife Service (USFWS) occurred in conjunction with the unsuitability findings under Criterion 9 (Critical Habitat for Threatened or Endangered Plant and Animal Species), Criterion 11 (Bald or Golden Eagle Nests), Criterion 12 (Bald and Golden Eagle Roost and Concentration Areas), Criterion 13 (Falcon Nesting Site(s) and Buffer Zone(s)), and Criterion 14 (Habitat for Migratory Bird Species).

Appendix B of the SGAC EIS document summarizes the unsuitability criteria, describes the general findings for the screening analyses discussed above, and presents a validation of these findings for the Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts based on the current information.

The USFWS maintains a list of T&E and candidate species and designated critical habitat on their official website; the website includes those species found in Wyoming. USFWS updates the species list annually, or sooner if any listing changes occur. The species list on the USFWS website fulfills the obligation of the USFWS, under section 7(c) of the Endangered Species Act of 1973, to provide a list of T&E species upon request for federal actions and NEPA compliance.

According to USFWS information (USFWS 2008a), three federally listed species could potentially occur in the Belle Ayr North, West Coal Creek, Caballo West, and Maysdorf II general analysis areas; the Ute ladies'-tresses orchid (*Spiranthes diluvialis*) (threatened), the black-footed ferret (*Mustela nigripes*) (endangered), and the blowout penstemon (*Penstemon haydenii*) (endangered). The effects upon these three species are described and analyzed in detail in this appendix.

The August 8, 2007 memorandum provided recommendations for protective measures for T&E species in accordance with the Endangered Species Act. Protective measures for migratory birds in accordance with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act and recommendations for the protection of wetlands (under Executive Order 11990 and Section 404 of the Clean Water Act) and for other fish and wildlife resources (under the Fish and Wildlife Coordination Act and the Fish and Wildlife Act of 1956) were also included. The memorandum identified the greater sage-grouse as a species of specific interest and the importance of identifying grouse habitats within the lease area and appropriate mitigation measures to minimize potential impacts to this species. The memorandum also stated that the USFWS would work with the BLM to ensure that the species-specific protective measures and programs for the conservation and recovery of listed species as required by under Section 7 of the Endangered Species Act are satisfied and carried out.

The Wyoming Game and Fish Department (WGFD) provided BLM with scoping comments for the four tracts included in the SGAC EIS in a letter from John Emmerich, Deputy Director, WGFD, Cheyenne, Wyoming, to Teresa Johnson, BLM, Casper Field Office, Casper, Wyoming, dated April 10, 2007 (WGFD 2007). WGFD recommended consideration be given to possible impacts to big game, sage grouse, raptors, and nongame species and their habitat, and aquatic resources within the South Gillette Area Coal project area.

REGULATORY REQUIREMENTS AND MITIGATION

The issuance of a Federal coal lease grants the lessee the exclusive rights to mine the coal, subject to the terms and conditions of the lease. Lease ownership is necessary for mining federal coal, but lease ownership does not authorize mining operations. Surface coal mining operations are regulated in accordance with the requirements of the Surface Mining Control and Reclamation Act of 1977 and Wyoming State regulations. The Surface Mining Control and Reclamation Act gives the Office of Surface Mining Reclamation

and Enforcement (OSM) primary responsibility to administer programs that regulate surface coal mining operations and the surface effects of underground coal mining operations. Pursuant to Section 503 of the Surface Mining Control and Reclamation Act, the Wyoming Department of Environmental Quality (WDEQ) developed, and in November 1980 the Secretary of the Interior approved a permanent program authorizing WDEQ to regulate surface coal mining operations and surface effects of underground mining on nonfederal lands within the State of Wyoming. In January 1987, pursuant to Section 523(c) of the Surface Mining Control and Reclamation Act, WDEQ entered into a cooperative agreement with the Secretary of the Interior authorizing WDEQ to regulate surface coal mining operations and surface effects of underground mining on federal lands within the state. In order to get approval of this cooperative agreement, the state had to demonstrate that the state laws and regulations are no less stringent than, meet the minimum requirements of, and include all applicable provisions of the Surface Mining Control and Reclamation Act.

If the Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts are leased, they would be a maintenance lease for the existing applicant mines, which currently have both approved Mineral Leasing Act of 1920 (MLA) mining plans and approved State mining and reclamation permits. In the case of maintenance leases, such as the Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts, the existing MLA mining plans and State mining and reclamation plans must be amended to include any newly leased area before that area can be mined. In order to amend the existing MLA mining plans and State mining and reclamation permits, the companies would be required to submit a detailed permit application packages to WDEQ before starting surface coal mining operations on any newly acquired leases. Wyoming Department of Environmental Quality/Land Quality Division (WDEQ/LQD) would review the permit application packages to insure the permit applications complies with the permitting requirements and the coal mining operation will meet the performance standards of the approved Wyoming program. If the permit application packages do comply, WDEQ would issue the applicants amended permits that would allow the permittee to extend coal mining operations onto the newly acquired leases.

Protection of fish, wildlife, and related environmental values is required under the Surface Mining Control and Reclamation Act regulations at 30 CFR 816.97, which state:

“No surface mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary of which is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended.”

In addition to requiring the operator to minimize disturbances and adverse impacts on fish, wildlife, and related environmental values, the regulations at

30 CFR 816.97 disallow any surface mining activity which is likely to jeopardize the continued existence of endangered or threatened species and require that the operator use the best technology currently available to minimize electrocution hazards to raptors; locate and operate haul and access roads to avoid or minimize impacts on important fish and wildlife species; and design fences, conveyors, and other potential barriers to permit passage of large mammals. Section 7 consultation would be required prior to approval of the mining and reclamation plan modification. Additional measures to ensure compliance with the Endangered Species Act and the Surface Mining Control and Reclamation Act can be developed when the detailed mining plan, which identifies the actual location of the disturbance areas, how and when they would be disturbed, and how they would be reclaimed, is developed and reviewed for approval. At the leasing stage, a detailed mining and reclamation plan is not available for evaluation or development of appropriate mitigation measures specific to an actual proposal to mine.

The following is a partial list of measures related to federally-protected species that are required as part of the mining and reclamation permits:

- avoiding bald eagle disturbance per the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act;
- restoring bald eagle foraging areas disturbed by mining;
- using raptor safe power lines; and
- surveying for Ute ladies'-tresses if habitat is present.

CUMULATIVE IMPACTS

Existing habitat-disturbing activities in the PRB include surface coal mining; conventional oil and gas and coal bed natural gas (CBNG) development; uranium mining; sand and gravel, and scoria mining; ranching; agriculture; road, railroad, and power plant construction and operation; recreational activities; and rural and urban housing development. Mining, construction and agricultural activities, and urban development tend to have more intense impacts on fairly localized areas, while ranching, recreational activities, and oil and gas development tend to be less intensive but spread over larger areas. Oil and gas development and mining activities have requirements for reclamation of disturbed areas as resources are depleted. The net area of energy disturbance in the Wyoming PRB has been increasing. In the short term, this means a reduction in the available habitat for T&E plant and wildlife species. In the long term, habitat is being and will continue to be restored as reclamation proceeds.

BLM is in the process of completing a regional technical study of current and proposed or potential development activity in the PRB to help the agency evaluate the impacts of coal development in the PRB. The *Powder River Basin Coal Review* consists of three tasks: Task 1 updates the BLM's 1996 status check for coal development in the PRB, Task 2 develops a forecast of reasonably foreseeable development in the PRB through the year 2020, and

Task 3 predicts cumulative impacts that would be expected to occur as a result of the projected development. The information about existing development in the following paragraphs is taken from the *Powder River Basin Coal Review* Task 2 report (BLM 2005a) and BLM lease records. The completed PRB Coal Review reports can be accessed at the BLM Wyoming website at <http://www.wy.blm.gov/minerals/coal/prb/prbdocs.htm>. The project area for Tasks 1 and 2 of the PRB Coal Review encompasses over eight million acres and includes all of Campbell, Sheridan, and Johnson Counties and the northern portion of Converse County in northeastern Wyoming.

Oil and gas exploration and production have been ongoing in the PRB for more than 100 years. Conventional (non CBNG) oil and gas fields are, for the most part, concentrated in the central and southern parts of the structural basin. Development of the CBNG resources from the coal beds is a more recent occurrence, with CBNG production in the Wyoming PRB starting in the late 1980s. As of 2003, an estimated 187,761 acres had been disturbed in the coal review project area as a result of oil and gas development activities, but approximately 115,045 acres of that disturbance has been reclaimed. This includes conventional oil and gas and CBNG wells and associated facilities and major transportation pipelines.

BLM estimates that the existing federal coal leases in the Wyoming PRB include approximately 121,185 acres. The currently pending federal coal LBA tracts (including the Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts) include approximately 35,245 additional acres. The majority of the coal in the areas permitted for surface coal mining is federal, but some state and private leases are included within some of the existing mine permit areas. All of the current and proposed federal coal leases are concentrated near the outcrop of the Wyodak coal bed, which is located in eastern Campbell County and the extreme northeastern edge of Converse County.

As of 2003, the base year for the PRB Coal Review, the surface coal mining operations along the Wyodak outcrop had disturbed approximately 68,794 acres. Approximately 24,097 of those acres of disturbance are occupied by “permanent” mine facilities, such as roads, buildings, coal handling facilities, etc., which are not available for reclamation until after coal mining operations end. Of the remaining 44,697 acres of disturbance available for reclamation, approximately 21,238 acres had been reclaimed.

The *Powder River Basin Coal Review* identified an estimated 4,891 additional acres of coal-related development disturbance (i.e., coal-fired power plants, railroads, and coal technology projects) as of 2003.

The estimated total development-related disturbance in the Wyoming PRB in 2003 was 264,704 acres. In addition to the coal and oil and gas development discussed above, this total includes other types of development disturbance, such as reservoirs and industrial fabrication firms, as well as public and

private infrastructure, such as highways and roads, government buildings, and residential and commercial real estate development. It should be noted that some of these disturbances overlap one another. In such cases, the disturbance acreage is counted separately under each category, but is not counted twice in determining the total area of disturbance.

Cumulative effects would also occur to T&E plant and wildlife resources as a result of indirect impacts. One factor is the potential import and spread of noxious weeds around roads and facilities. Noxious weeds have the ability to displace native vegetation and hinder reclamation efforts. Control of noxious weeds is addressed in surface coal mining and reclamation plans. If weed mitigation and preventative procedures are applied to all construction and reclamation practices, the impact of noxious weeds on T&E plants and wildlife would be minimized.

In reclaimed areas, vegetation cover often differs from undisturbed areas. In the case of surface coal mines, re-established vegetation would be dominated by species mandated in the reclamation seed mixtures (to be approved by WDEQ). The majority of the species in the approved reclamation seed mixtures are native to the area; however, reclaimed areas may not serve ecosystem functions presently served by undisturbed vegetation communities and habitats. In the short-term in particular, species composition, shrub cover, and other environmental factors are likely to differ from pre-disturbance vegetation communities and habitats. Establishment of noxious weeds and alteration of vegetation in reclaimed areas has the potential to alter T&E plant and wildlife habitat composition and distribution.

Potential adverse effects to listed and proposed species that have occurred and would continue to occur as a result of existing and potential future activities in the PRB would include direct loss of habitat, indirect loss of habitat due to human and equipment disturbance, and habitat fragmentation. The existing mines have developed mitigation procedures, as required by the Surface Mining Control and Reclamation Act (at 30 CFR 816.97) and Wyoming State regulations, to protect T&E species. These procedural requirements would be extended to include mining operations on the Belle Ayr North, West coal Creek, Caballo West, and Maysdorf II LBA tracts, if they are leased as proposed and after required detailed plans to mine the coal and reclaim the mined-out areas are developed and approved. Species specific cumulative impacts are discussed below by tract.

SECTION 1

BELLE AYR NORTH LBA TRACT

E1-1.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

E1-1.1 The Proposed Action

On July 6, 2004, RAG Coal West, Inc. filed an application with the BLM to lease federal coal reserves in a tract located west of and immediately adjacent to the Belle Ayr Mine (Figure E-1). The tract was assigned case file number WYW161248. In August 2004, RAG Coal West, Inc. finalized the sale of the Belle Ayr Mine to Foundation Coal West, Inc. (FCW), a directly held subsidiary of Foundation Coal Corporation. Under the Proposed Action for the Belle Ayr North LBA tract, the tract as applied for by FCW would be offered for lease at a sealed-bid, competitive lease sale. The boundaries of the tract would be consistent with the tract configuration proposed in the Belle Ayr North LBA tract lease application (Figure E1-1). The Proposed Action assumes that FCW will be the successful bidder on the Belle Ayr North LBA tract if it is offered for sale.

The legal description of the proposed Belle Ayr North LBA tract coal lease lands as applied for by FCW under the Proposed Action is as follows:

T. 48 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 18: Lots 17, 18, 19(W $\frac{1}{2}$, SE $\frac{1}{4}$);	113.48 acres
Section 19: Lots 5 through 19;	606.93 acres
Section 20: Lots 3 (SW $\frac{1}{4}$), 4 (W $\frac{1}{2}$, SE $\frac{1}{4}$), 5, 6, 7 (S $\frac{1}{2}$), 9 (S $\frac{1}{2}$), 10 through 16;	450.43 acres
Section 21: Lots 13, 14;	81.52 acres
Section 28: Lots 3 through 6;	161.98 acres
Section 29: Lots 1, 6;	81.63 acres

T. 48 N., R.72 W., 6th PM, Campbell County, Wyoming

Section 24: Lots 1, 8.	<u>82.77 acres</u>
Total:	1,578.74 acres

The coal estate in the tract described above is federal and the surface estate is owned by FCW. Surface ownership is shown in Figure E1-2.

The tract as applied for includes approximately 1,578.74 mineable acres. It is assumed that an area larger than the tract would have to be disturbed in order to recover all of the coal in the tract. The disturbances outside of the tract

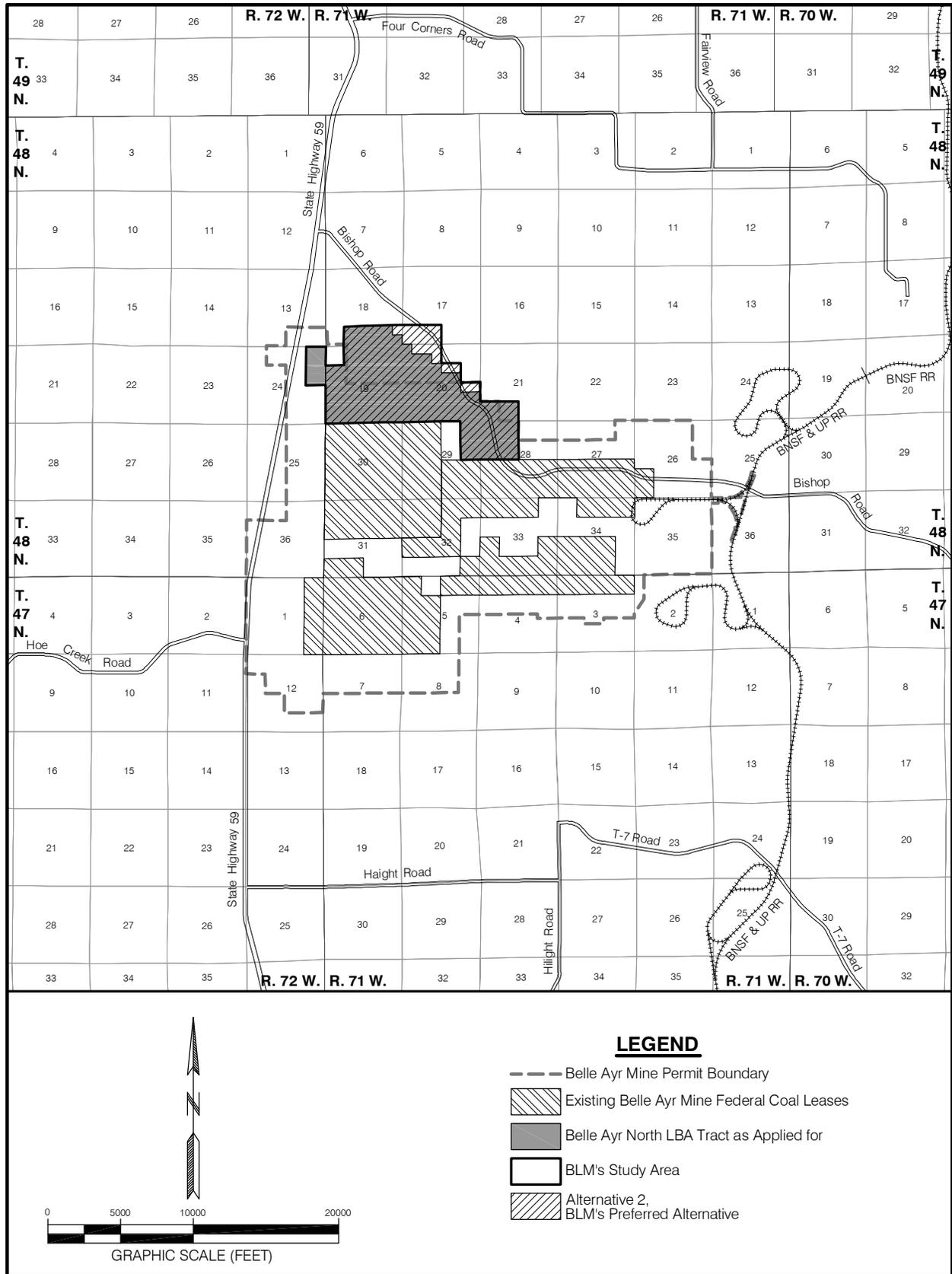


Figure E1-1 Belle Ayr North LBA Tract Alternatives.

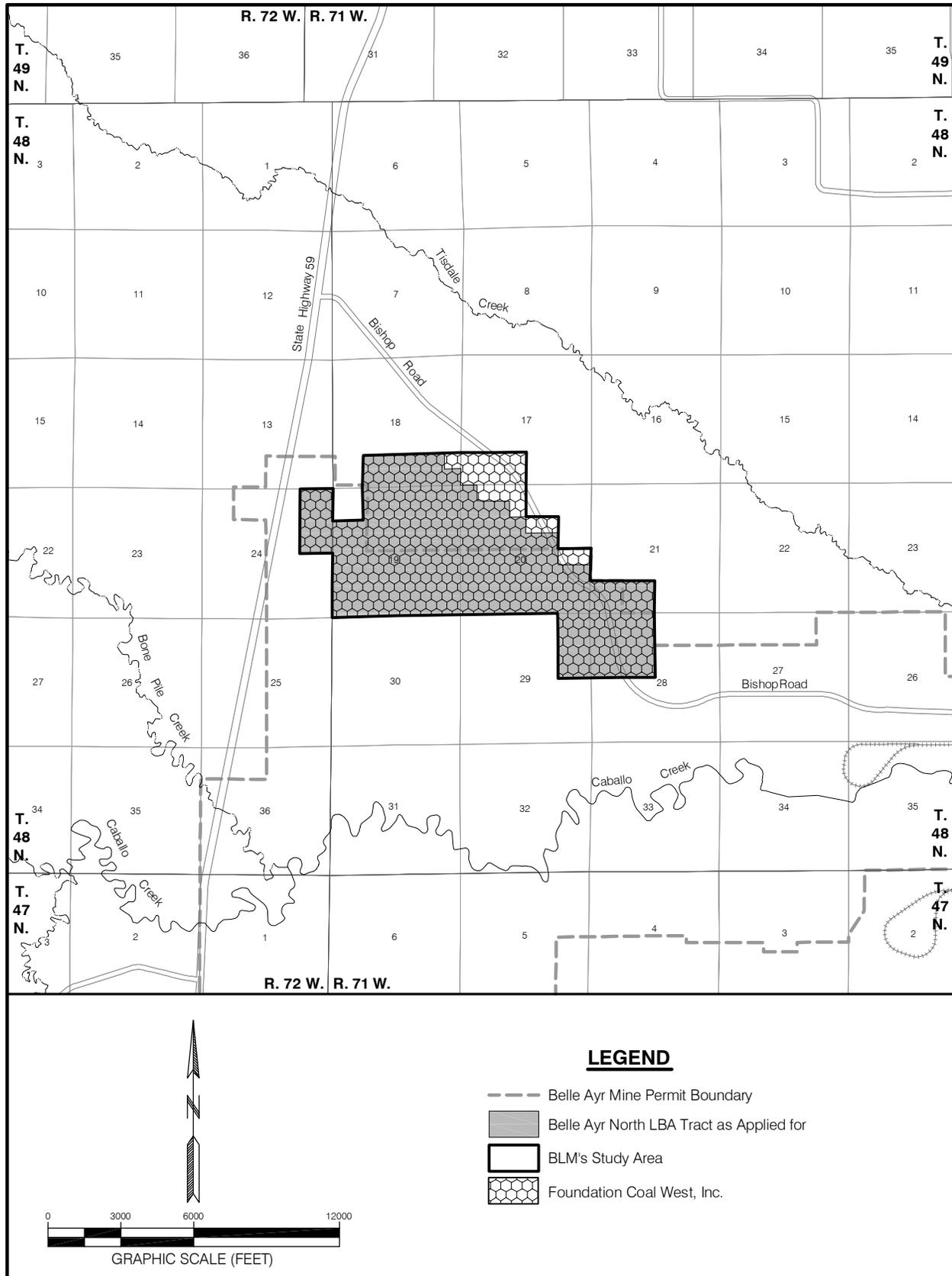


Figure E1-2. Surface Ownership Within the Belle Ayr North LBA Tract Alternatives.

would be due to activities like overstripping, matching undisturbed topography, and construction of flood control and sediment control structures.

E1-1.2 Alternatives to the Proposed Action

E1-1.2.1 Alternative 1

Under Alternative 1, the No Action Alternative, the application to lease the coal included in the Belle Ayr North LBA tract would be rejected, the tract would not be offered for competitive sale, and the coal included in the tract would not be mined. This would not affect permitted mining activities and employment on the existing leases at Belle Ayr Mine and would not preclude an application to lease the federal coal included in the Belle Ayr North LBA tract in the future. No additional surface of the Belle Ayr North LBA tract would be disturbed due to overstripping to allow coal to be removed from the adjacent existing leases.

E1-1.2.2 Alternative 2

Under Alternative 2 for the Belle Ayr North LBA tract, BLM would reconfigure the tract, hold a competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. In evaluating the Belle Ayr North coal lease application, BLM identified a study area, which includes unleased federal coal adjacent to the northern edge of the tract as applied for (Figure E1-1). BLM is evaluating the potential that some or all of these lands could be added to the tract to provide for more efficient recovery of the federal coal, increase competitive interest in the tract, and/or reduce the potential that some of the potentially mineable federal coal in this area would be bypassed in the future if it is not included in the Belle Ayr North LBA tract. The modified tract would be subject to standard and special lease stipulations developed for the PRB and this tract if it is offered for sale, as discussed above. Alternative 2, holding a competitive coal sale for a modified tract, is BLM's Preferred Alternative.

Alternative 2 for the Belle Ayr North LBA tract assumes that FCW would be the successful bidder on the tract if a lease sale is held and that the tract would be developed as a maintenance lease to extend the life of the adjacent Belle Ayr Mine. Other assumptions are the same as for the Proposed Action. The lands that BLM is considering adding to the tract are:

T. 48 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 17: Lots 13, 14;	82.53 acres
Section 18: Lots 19 (NE ¹ / ₄);	10.34 acres
Section 20: Lots 3 (E ¹ / ₂ , NW ¹ / ₄), 4 (NE ¹ / ₄), 7 (N ¹ / ₂), and 9 (N ¹ / ₂);	<u>82.19 acres</u>

Total Added:	175.06 acres
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The area BLM is evaluating removes the following lands from the tract as applied for:

T. 48 N., R.72 W., 6th PM, Campbell County, Wyoming

Section 24: Lots 1, 8.	<u>-82.77 acres</u>
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Total (Net Change):	92.29 acres
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The legal description of BLM’s reconfiguration of the Belle Ayr North LBA tract under Alternative 2 is as follows:

T. 48 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 17: Lots 13, 14;	82.53 acres
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Section 18: Lots 17, 18, 19;	123.82 acres
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Section 19: Lots 5 through 19;	606.93 acres
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Section 20: Lots 3 through 7, 9through 16;	532.62 acres
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Section 21: Lots 13, 14;	81.52 acres
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Section 28: Lots 3 through 6;	161.98 acres
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Section 29: Lots 1, 6.	<u>81.63 acres</u>
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Total:	1,671.03 acres
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Not all of the coal included in the Belle Ayr North LBA tract is considered to be mineable at this time. A portion the Bishop Road (County Road 12) overlies some of the coal included in the tract. As discussed in Chapter 1, section 1.1, the Surface Mining Control and Reclamation Act prohibits mining within 100 ft on either side of the right-of-way of any public road (43 CFR 3461). There would also be a quantity of coal east of the Bishop Road that would be isolated from the mining operations if the coal under the road was not mined. The coal underlying the portion of the Bishop Road and its right-of-way, and the 100 ft buffer zone within the Belle Ayr North LBA tract could be mined if the Campbell County Board of Commissioners, the authorized agency, determines that the road can be moved [30 CFR 761.11(d)]. FCW is evaluating the feasibility of relocating the road at this time.

FCW estimates that the reconfigured tract includes approximately 221.1 million tons of in-place coal and 162.6 million tons of mineable coal. Using

FCW's projected recovery factor of 94 percent, the reconfigured tract would contain about 152.8 million tons of recoverable coal.

E1-2.0 SPECIES HABITAT AND OCCURRENCE AND EFFECTS OF THE PROPOSED PROJECT

The Belle Ayr Mine began producing coal in 1972. Wildlife monitoring has been conducted annually for the mine since 1984. This wildlife monitoring was designed to meet the WDEQ/LQD, WGFD, and federal requirements for annual monitoring and reporting of wildlife activity on coal mining areas. Detailed procedures and site-specific requirements have been carried out as approved by WGFD and USFWS. The monitoring program was conducted in accordance with Appendix B of WDEQ/LQD Coal Rules and Regulations. Because the areas covered in the wildlife surveys included the mine's permit area and a large perimeter around the permit boundary, the entire Belle Ayr North LBA tract has been included in baseline inventories and annual wildlife surveys conducted for the Belle Ayr Mine since wildlife studies began.

The approved Belle Ayr Mine Permit 214 Term T6 (FCW 2005) includes monitoring and mitigation measures for the Belle Ayr Mine that are required by the Surface Mining Control and Reclamation Act and Wyoming State Law. If the Belle Ayr North LBA tract is acquired by FCW, these monitoring and mitigation measures would be extended to cover operations on the LBA tract when the Belle Ayr Mine's mining permit is amended to include the tract. This amended permit would have to be approved before mining operations could take place on the tract. These monitoring and mitigation measures are considered to be part of the Proposed Action and Alternative 2 during the leasing process because they are regulatory requirements.

Background information on T&E species in the vicinity of the Belle Ayr North LBA tract was drawn from several sources, including: the original baseline inventory (1974), wildlife survey reports submitted by the Belle Ayr Mine to the WDEQ/LQD from 1984 through 2006, the Final South Powder River Basin Coal EIS (BLM 2003), the Final EIS for the Maysdorf Coal Lease Application (BLM 2007), a Wyoming Natural Diversity Database search (University of Wyoming 2001), and from WGFD and USFWS records and contacts in 2007. In addition, the Belle Ayr North LBA tract wildlife study area falls within the wildlife monitoring areas for the nearby Caballo and Cordero Rojo Mines (Figure E-1).

Site-specific data for a substantial portion of the tract as applied for and the study area for Alternative 2 were obtained from several sources, including WDEQ/LQD permit applications and annual wildlife reports for the Belle Ayr Mine and other nearby coal mines. Baseline wildlife studies were conducted by Thunderbird-Jones & Stokes, expressly for the Belle Ayr North LBA tract in 2006 early 2007.

The Belle Ayr North LBA tract is in an area of gently rolling terrain of moderate relief influenced by Duck Nest Creek and other tributaries of Caballo Creek. Elevations range from 4,515 to 4,666 ft within the LBA tract and from 4,515 to 4,704 ft including the area added under Alternative 2. Within the LBA tract and the area added under Alternative 2, slopes range from flat to over 28 percent in the eastern portion of the tract, south of the Bishop Road. The slopes of the gently rolling uplands, which comprise most (about 74 percent) of the LBA tract, seldom exceed 4 percent. A slope analysis would be done for the LBA tract if a lease sale is held and it is proposed for mining.

Predominant wildlife habitat types classified on the LBA tract and adjacent area correspond with the major plant communities defined during the vegetation baseline study and consist primarily of crested wheatgrass pasture and sagebrush/grassland. Other habitats present in limited extent include disturbed areas and grassland areas. Networks of road, pipeline, tank battery, and well-pad disturbance areas associated with oil and gas development overlay much of the study area.

The Belle Ayr Mine site is situated near the center of the PRB, which is a broad structural trough that lies between the Big Horn Mountains and the Black Hills. The PRB is drained by three separate drainage systems: the Powder/Little Powder, the Cheyenne, and the Belle Fourche Rivers. Lying between the Powder River and Cheyenne River drainage basins is the Belle Fourche River drainage system, which is a narrow, linear-shaped basin extending from the Pumpkin Buttes northeast to the Black Hills. The topography of the Belle Fourche drainage basin is typified by broad, flat, inter-stream uplands and a wide, level expanse of eastward-sloping plains broken by a few isolated buttes.

The Belle Ayr Mine lies within the Caballo Creek watershed, which is a tributary of the Belle Fourche River. Caballo Creek flows from west to east through the mine's permit area and empties into the Belle Fourche River approximately 7 miles east-southeast of the Belle Ayr North LBA tract in Section 3, T.47N., R.70W. (Figure 3-27 in the SGAC EIS document). The total drainage for Caballo Creek is approximately 260 square miles, and the mainstream channel is about 51 miles long. The Caballo Creek watershed has a dendritic drainage pattern with an approximate width (north-south) of 12.8 miles and an approximate length (east-west) of 25.0 miles. The relief of Caballo Creek's basin is 740 feet from its headwaters to its confluence with the Belle Fourche River.

The Belle Ayr Mine disturbs several drainages within the Caballo Creek watershed and Caballo Creek is currently diverted by the mining operation. The Belle Ayr Mine is currently permitted to disturb approximately 7 percent of the Caballo Creek drainage basin. The entire undisturbed Caballo Creek drainage basin was extensively studied by the Belle Ayr Mine and the results of that study are included in the mine and reclamation permit (FCW 2003). A large portion of the Belle Ayr North LBA tract is within the mine's existing

permit area, and Duck Nest Creek, a southeast-flowing ephemeral tributary of Caballo Creek, drains the western portion of the LBA tract. Two smaller, first order tributaries of Caballo Creek (called Draw No. 1 and Draw No. 2 by the Belle Ayr Mine) and three playas formed by natural topographic depressions drain the eastern portion of the Belle Ayr North LBA tract. The Belle Ayr Mine permit area, the Belle Ayr North LBA tract, and a portion of the undisturbed Caballo Creek watershed are shown on Figure 3-27 in the SGAC EIS document.

Belle Ayr North LBA Tract Wetlands

Wetland inventories have been completed on those portions of Caballo Creek and its tributaries that lie within Belle Ayr Mine's existing permit area. A large portion of the Belle Ayr North LBA tract is within the mine's existing permit area (Figure S1-6 in the SGAC Supplementary Information document); therefore, a wetland inventory on Duck Nest Creek, including the entire stream segment that lies within the BLM study area for the LBA tract, has been conducted and is included in the mine's approved mine permit.

There have been numerous correspondences between the U.S. Army Corps of Engineers (COE) and Belle Ayr Mine on wetland inventories and determinations related to mine permit revisions. Most recently, on September 29, 1999, the COE conducted a site visit of wetland areas within the Belle Ayr Mine's permit area. Following that visit, a revised premining wetland delineation and discussion of wetlands to be impacted for the entire permit area was presented to COE in a letter from the mine, dated September 30, 1999. A response letter from COE to the mine, dated October 1, 1999, authorized the revised delineation and impact determination (FCW 2003). These premining wetland areas that occur within and adjacent to the Belle Ayr North LBA tract are shown on Figure S1-6 in the SGAC Supplementary Information document.

Belle Ayr Mine's most recent delineation of wetlands and other Waters of the U.S. over the existing permit area identified these four types of wetlands: Man Made, Stream Channel, Saline, and Playa (FCW 2003). The man-made wetlands are found in association with small reservoirs and stock ponds. Stream channel wetlands are primarily moist to wet grassy meadows, usually less than 20 feet wide, and restricted to the stream channel and areas immediately adjacent to the stream bank. Saline wetlands occur only along the upper section of Duck Nest Creek and are characterized by saturated soils that commonly have salt deposits on the surface. Playa wetlands occur on areas with internal drainage that are intermittently flooded in response to spring runoff or runoff from intense thunderstorms. These individual wetland units and their respective areas (in acres) are shown within the Belle Ayr North LBA tract wetlands analysis area on Figure S1-6 in the SGAC Supplementary Information document. Accordingly, a total of approximately 193.9 acres of Waters of the U.S., including a total of 14.4 acres of jurisdictional Waters of the U.S. occur within the wetlands analysis area for the Belle Ayr North LBA tract. Approximately 11.9 of those acres are jurisdictional wetlands that occur along the watercourse of Duck Nest Creek. The 2.5 acres of jurisdictional other

Waters of the U.S. that did not qualify as jurisdictional wetlands consist primarily of open water that is held within the in-channel impoundments and intermittent pools along Duck Nest Creek. The non-jurisdictional Waters of the U.S. contained in the wetlands analysis area (approximately 179.5 acres) consists of the internally drained playas.

Within the proposed lease area and adjacent study area there is no “critical” habitat designated by USFWS for T&E species. The following discussion describes species’ habitat requirements and their occurrence in the area of the Belle Ayr North LBA tract and evaluates the potential environmental effects of the Proposed Action and Alternative 2 on federal T&E species.

E1-2.1 Threatened Species

E1-2.1.1 Ute ladies’-tresses

Ute ladies’-tresses, a member of the orchid family, was listed as threatened on January 17, 1992, due to a variety of factors, including habitat loss and modification, hydrological modifications of existing and potential habitat areas, and invasion of exotic plant species. At the time of listing, Ute ladies’-tresses was only known from Colorado, Utah, and extreme eastern Nevada. Ute ladies’-tresses orchids were discovered in Wyoming in 1993. It is currently known from western Nebraska, eastern Wyoming, north-central Colorado, northeastern and southern Utah, east-central and southeastern Idaho, southwestern Montana, and central Washington.

Biology and Habitat Requirements: Ute ladies’-tresses is a perennial, terrestrial orchid with erect, glandular-pubescent stems 12 to 50 cm tall arising from tuberous-thickened roots. Ute ladies’-tresses occurs primarily on moist, subirrigated or seasonally flooded soils bordering wetland meadows, springs, lakes, or perennial streams. The elevation range of known occurrences is 4,200 to 7,000 feet in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows. Most populations are found on alluvial sand, coarse silt, or whitish loamy clay with a slightly basic pH. These soils are derived from Quaternary alluvial deposits or drab Eocene- age sandstones and claystones (Fertig 2000). Ute ladies’-tresses is not found in heavy, tight clay soils, saline, or alkaline soils.

This orchid can be commonly associated with horsetail, milkweed, verbena, blue-eyed grass, reedgrass, goldenrod, bentgrass, and arrowgrass (USFWS 2005). Wyoming populations often occur in moist meadow communities dominated by redtop, common quackgrass, Baltic rush, foxtail barley, or switchgrass within a narrow vegetative band between emergent aquatic vegetation and dry upland prairie (Fertig 2000). Vegetative cover tends to range from 75-90 percent and is usually less than 45 cm tall (Fertig 2000). The orchid seems intolerant of shade. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system.

In Wyoming, this species typically blooms from early August to early September, with fruits produced from mid-August to September (Fertig 2000). Leaves persist during flowering (Moseley 1998). Flowers are white or ivory and are clustered into a spike at the top of the stem. No direct observations of pollination have been made in Wyoming. In their 1994 report, Sipes and Tepedino indicated that large, long-tongued bumblebees in the genus *Bombus* are the primary pollinators in Utah and Colorado (Fertig 2000). Smaller bees may also visit these flowers, but have the incorrect body shape or mass to properly accommodate the orchid's large, sticky anther/pollen clusters (Fertig 2000).

This species reproduces basically by sexual reproduction and can produce as many as 7,300 tiny seeds per fruit (Fertig 2000). The plant requires mycorrhizal fungi to germinate and establish. Individual plants may not flower in consecutive years under adverse environmental conditions but will persist below ground with their mycorrhizal symbionts (Fertig 2000).

Flowers are needed for positive plant identification. The species can be reliably located only when it is flowering (Heidel 2001). Plants probably do not flower every year and may remain dormant below ground during drought years. In general, the species' best flowering years seem to correspond with extreme heat during flowering. Preliminary review of climate data also indicates that growing seasons that start out as relatively cold and wet correspond with low flowering levels (Heidel 2001).

The orchid is well adapted to disturbances from stream movement and is tolerant of other disturbances such as grazing that are common to grassland riparian habitats (USFWS 1995). Populations are often dynamic and "move" within a watershed as disturbances create new habitat or succession eliminates old habitat (Fertig and Beauvais 1999). Ute ladies'-tresses colonize early successional riparian habitats such as point bars, sand bars, and low-lying gravelly, sandy, or cobbly edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing season. The orchid has been known to establish in heavily disturbed sites, such as revegetated gravel pits, heavily grazed riparian edges, and along well-traveled foot trails on old berms (USFWS 1995).

Existing Environment: Prior to 2005, four orchid populations had been documented within Wyoming, all discovered between 1993 and 1997 (Fertig and Beauvais 1999). Four additional sites were located in 2005 and one additional site was found in 2006 (Heidel, 2007). The new locations were in the same drainages or tributaries as the original four populations. Drainages with documented orchid populations include Antelope Creek and tributaries in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County. No occurrences have been recorded in Campbell County including the Belle Ayr North vegetation general analysis.

Areas of suitable habitat within the Belle Ayr North LBA tract and adjacent study area were surveyed by ESCO Associates, Inc. of Boulder, Colorado in August 2006 and August 2007. Topographical and wetland delineation maps for the study area were reviewed to identify all significant drainages and potential habitat that may contain the orchid.

Suitable habitat was traversed on foot during the time of actual flowering of the known population, and it involved walking entire lengths of the drainages documenting locations of potential habitat and searching for this species.

The environs of the Duck Nest Creek drainage that passes through the study area constitute the closest approximation of suitable habitat for the plant. However, while naturally prone to accumulating moisture because of topographic position, they also are underlain by Arvada soils (or the similar saline phases of Heldt and Bidman soils) that have considerable salt accumulation, and, during dry years are themselves quite dry. As such, these areas do not constitute likely habitat for the plant by virtue of lack of dependable moisture and high salinity. A pedestrian survey of these areas in August 2006 revealed no individuals of Ute Ladies'-Tresses Orchid.

Playa Grassland was suggested by USFWS (personal communication) as suitable habitat and the portion of the LBA site occupied by this type was also searched in August 2006 with the same results. Eastern Wyoming playas, except during hypothetically potential extraordinary years of unrelenting rain, would probably never naturally sustain the moist conditions required by the orchid. Even following the springs when the playas do occasionally, but only temporarily, include standing water, subsequent summer conditions accompany a thorough drying that excludes any routine manifestation of moisture-loving perennial plant species such as the orchid.

Effects of the Proposed Project: Mining the federal coal included in the Belle Ayr North LBA tract, if the tract is leased under the Proposed Action or Alternative 2, may affect, but is not likely to adversely affect Ute ladies'-tresses. Typical suitable habitat for this species on the tract is very limited and found along the CBNG-impacted bottomlands of Little Duck Nest Creek and its tributaries. However, the quality of potential habitat is extremely poor. Outside of the narrow riparian strips located along these impacted watercourses, typical suitable habitat is rare or non-existent in the study area. Multiple surveys of the existing suitable habitat at the Belle Ayr Mine and other mines in this area have not found any Ute ladies'-tresses. Because of the ability of this species to persist below ground or above ground without flowering, single season surveys that meet the current USFWS survey guidelines may not detect populations. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for Ute ladies'-tresses within the project area should be identified and surveyed prior to surface mining activities.

Jurisdictional wetlands located in the Belle Ayr North LBA tract that are destroyed by mining operations would be replaced in accordance with the requirements of Section 404 of the Clean Water Act, as determined by COE. The replaced wetlands may not duplicate the exact function and landscape features of the pre-mine wetlands. COE considers the type and function of each jurisdictional wetland that will be impacted and may require restoration of additional acres if the type and function of the restored wetlands will not completely replace the type and function of the original wetland. Replacement of non-jurisdictional and functional wetlands may be required by the surface land owner and/or WDEQ/LQD. WDEQ/LQD allows and sometimes requires mitigation of non-jurisdictional wetlands affected by mining, depending on the values associated with the wetland features.

Cumulative Effects: Alterations of stream morphology and hydrology are believed to have extirpated Ute ladies'-tresses from most of its historical range (USFWS 2002). Disturbance and reclamation of streams by surface coal mining may alter stream morphology and hydrology. The large quantities of water produced with CBNG development and discharged on the surface may also alter stream morphology and hydrology.

E1-2.2 Endangered Species

E1-2.2.1 Black-footed ferret

The black-footed ferret, a nocturnal mammal and an obligate associate of prairie dogs (*Cynomys* spp.), was listed as endangered in March, 1967. This species is thought to have historically inhabited a nearly contiguous matrix of prairie dog colonies spanning the short-grass prairies of the eastern and southern Rockies and the Great Plains of North America (Forrest et al. 1985). Since the early 1930s, numerous factors have led to substantial declines in prairie dog colonies in that region. Reductions in some states are estimated as high as 90% from formerly occupied colonies (Rose 1973, Tyler 1968).

Conversion of grasslands to agricultural landscapes, eradication of prairie dogs, and diseases such as the plague and canine distemper have resulted in severe reductions in prairie dog colonies across the west, colonies which provided food, shelter, and habitat for black-footed ferrets. This species of ferret is currently one of the most endangered mammals in North America and was thought to be extinct until a small population was discovered in Meeteetse, Wyoming in September, 1981. Since then, successful captive breeding and reintroduction programs have released black-footed ferrets back into the wild in several western and Great Plains states including Wyoming, Montana, South Dakota, Colorado, Utah, and Arizona.

Biology and Habitat Requirements: Ferrets rely on prairie dogs to provide both shelter and food (Hillman and Clark 1980). Ferrets produce one litter per year, typically giving birth to four or five kits. The decline in ferret populations has been largely attributed to the reduction in the vast prairie dog colonies that

historically existed in the western United States. Despite extensive ferret surveys over the past 20 plus years throughout Wyoming, the last known wild black-footed ferret population was discovered near Meeteetse in 1981 (Miller et al. 1996). Those surveys included numerous USFWS-approved clearances for coal mining and other development in the Powder River Basin of Wyoming, as well as U.S. Department of Agriculture – Forest Service (USFS) surveys for ferrets on the TBNG. Reintroduction efforts involving captive bred individuals have successfully established one black-footed ferret population in the Shirley Basin area in south-central Wyoming. Currently, this is the only known black-footed ferret population within the state, though other populations are present elsewhere in the United States and Mexico.

Existing Environment: The Belle Ayr North LBA tract is within the historical range of the black-footed ferret, although no black-footed ferrets are presently known to occur in northeastern Wyoming. During the 1980s, WGFD, in cooperation with other agencies, conducted searches for black-footed ferrets in Wyoming in the places they were most likely to be found, but these searches were not successful (Martin Grenier, personal communication, 10/14/2003). In a February 2, 2004 letter to interested parties, the USFWS declared that black-footed ferret surveys are no longer necessary in black-tailed prairie dog colonies within Wyoming.

No black-tailed prairie dog colonies are currently present on the Belle Ayr North wildlife general analysis area. No evidence of ferrets has been recorded during general or specific ferret surveys over the last 30 years (1976–2006) conducted by wildlife consultants for the Belle Ayr Mine and other mines in this area.

Effects of the Proposed Project: **Mining the federal coal included in the Belle Ayr North LBA tract, if a lease is issued under the Proposed Action or Alternative 2, would have no effect on black-footed ferrets.** Given the documented absence of black-footed ferrets in the region, including the general analysis area during specific surveys for this species, the lack of colonies within the LBA tract and surrounding area, the block clearance issued by USFWS for black-tailed prairie dog colonies throughout the entire state, and the distance of the LBA area from future reintroduction sites, mining the general analysis area will not result in any direct or indirect effects on black-footed ferrets.

Mine activities include, but are not limited to, large-scale topsoil stripping, the intense presence of heavy machinery, extended human presence, loud noise and various linear disturbances such as roads, power lines and fences. Additionally, ongoing disturbance (grazing, oil and gas production, etc.) from sources unrelated to mining would likely continue, with some activities occurring within prairie dog colonies in the area. These activities would result in less habitat disturbance than surface mining, but physical disturbance would occur.

Appendix E

Based on more than 20 years of historic and recent survey efforts and other general analysis area data and information, it is unlikely that ferrets exist in the Belle Ayr North wildlife general analysis area.

Cumulative Effects: Mineral development within black-tailed prairie dog colonies is a leading cause of ferret habitat loss in the PRB. Surface coal mining tends to have more intense impacts on fairly localized areas, while oil and gas development tends to be less intensive but spread over larger areas. Oil and gas development and mining activities have requirements for reclamation of disturbed areas as resources are depleted. In reclaimed areas, vegetation cover may differ from undisturbed areas. In the case of surface coal mines, re-established vegetation would be dominated by species mandated in the reclamation seed mixtures (to be approved by WDEQ). The majority of the approved plant species are native to the area; however, reclaimed areas may not serve ecosystem functions presently served by undisturbed vegetation communities and habitats, particularly in the short-term, when species composition, shrub cover, and other environmental factors are likely to be different. Shifts in habitat composition or distribution following reclamation could increase or decrease potential habitat for prairie dogs and associated habitat for black-footed ferrets. However, black-tailed prairie dogs have been recorded invading and establishing towns on reclaimed coal mined lands in northeastern Wyoming (IR 2005).

Potential ferret habitat is also affected by other impacts to prairie dog populations. Plague can infect and eliminate entire prairie dog colonies. Poisoning and recreational prairie dog shooting may locally reduce prairie dog populations, but seldom completely eliminate colonies.

E1-2.2.2 Blowout Penstemon

Blowout Penstemon, a member of the figwort family, was listed as endangered on October 1, 1987. It is known from multiple populations in western Nebraska and in the Ferris dunes area in northwestern Carbon County, Wyoming. The plant was first discovered in Wyoming in 1877 and then rediscovered in 1996 (BLM 2008). The removal of fire, leveling of dunes, reduction of grazing, and cultivation of stabilizing cover crops drastically reduced the amount of habitat available for this species. Loss of habitat, coupled with impacts from insect outbreaks, drought, inbreeding, and potential over collection, has caused problems for the plant (University of Wyoming 2009). Only 3,500-5,000 plants are currently found in Nebraska at about a dozen sites. The Wyoming population is limited to three sites in northern Carbon County that contain several thousand plants (BLM 2008). Threats to the plant may occur when sand dunes are removed or overly disturbed by vehicular traffic (USFWS 2008b).

Biology and Habitat Requirements: Blowout penstemon is a perennial herb with stems less than 12 inches tall. The inflorescence is 2 to 6 inches long and has six to ten compact whorls of milky-blue to pale lavender flowers. This

species typically flowers from mid-June to early-July. The plant's current know range in Wyoming is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25 to 40 percent vegetative cover (USFWS 2008b).

Existing Environment: The Belle Ayr North LBA tract is not within the documented historical range of the blowout penstemon. It is located approximately 150 miles northwest of the Nebraska known occurrences and approximately 150 miles northeast of the Wyoming occurrences. No suitable sand dunes (whether stable or blownout) are currently present on the Belle Ayr North vegetation general analysis area.

Effects of the Proposed Project: **Mining the federal coal included in the Belle Ayr North LBA tract, if a lease is issued under the Proposed Action or Alternative 2, would have no effect on blowout penstemon.** Typical suitable habitat for this species on the tract is non-existent. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for blowout penstemon within the project area should be identified and surveyed prior to surface mining activities.

Cumulative Effects: This species is potentially vulnerable to habitat loss and degradation resulting from sand mining, water development, energy development, ORV use, and associated destabilization of its sand dune habitat. It also could be vulnerable to negative effects related to the spread of non-native species within its range.

E1-3.0 SUMMARY OF DETERMINATIONS

Table E1-1 summarizes the determinations for federally listed T&E species in the area of the Belle Ayr North LBA tract that may result from implementing the Proposed Action or Alternative.

Table E1-1. Effects Evaluation of Sensitive and Federal T&E Species in the Area of the Belle Ayr North LBA Tracts.

Status	Species Common Name	Potential Effects
Threatened:	Ute ladies'-tresses	May affect ¹
Endangered:	Black-footed ferret	No effect
Endangered:	Blowout Penstemon	No effect

¹ Not likely to adversely affect individuals or populations.

E1-4.0 CREDENTIALS OF SURVEY PERSONNEL

E1-4.1 Jones & Stokes of Gillette, Wyoming

Gwyn McKee

Ms. McKee obtained a Master of Science degree in Wildlife Ecology/Management from the University of Missouri-Columbia. She has accumulated nearly 20 years of professional experience, with the last 14 spent working with the energy industry in Wyoming, Montana, and South Dakota. Ms. McKee has conducted the wildlife surveys and impact analyses for most of the surface coal mines in the Powder River Basin during her tenure in Wyoming, including two of the three properties analyzed in the South Gillette Area Coal EIS. She has also provided and/or reviewed the pertinent text related to impact assessments for vertebrate species of concern for most of the coal EISs that have been prepared in the Powder River Basin since 2000.

Jennifer Ottinger

Ms. Ottinger received a B.S. in Zoology from Colorado State University in 1993, with a minor in Microbiology. She has 12 years of professional experience with a variety of vertebrate species, including surveys for sage-grouse and mountain plovers, though her work has focused on raptors during that period. Ms. Ottinger has worked throughout the U.S. and abroad. She joined Jones & Stokes as a Wildlife Biologist in 2004. She has strong raptor identification and handling skills, research experience, proven abilities in data analysis and technical writing, and has presented and/or published several articles in a variety of professional meetings and publications, respectively.

E1-4.2 ESCO Associates Inc. (ESCO) of Boulder, Colorado

David L. Buckner

Education: B.A., M.A., and Ph.D. in Plant Ecology, University of Colorado, Boulder

Familiarity with *Spiranthes diluvialis*: observation of flowering populations in Boulder County, 1991-2005; observation of vegetative sprouts of individuals occurring in Boulder County populations, January to April 1992, June 1993, May 1995.

Other Rare Plant Survey Experience (representative): *Asclepias ruthiae*, Grand County, Utah, 1982; *Stellaria irrigua*, La Plata County, Colorado; *Sclerocactus glaucus*, Mesa and Garfield Counties, Colorado, 1987; *Penstemon harringtonii*, Eagle, Grand, and Routt Counties, Colorado, 1982, 1990, 1991, 1993, and 1994; *Ptilagrostis porteri*, Teller County, Colorado, 1992, *Carex oreocharis*, *Carex scirpoidea*, *Rubus (Cylactis) arctica* ssp. *acaulis*, *Mimulus gemmiparus*, *Salix candida*, *Aquilegia saximontana*, *Botrychium lunaria*, and *Listera borealis*,

Clear Creek and Park Counties, Colorado 1995, 1996; *Lesquerella congesta*, *Physaria obcordata*, *Astragalus lutosus*, *Festuca dasyclada*, *Gentianella tortuosa*, *Lesquerella parviflora*, and *Thalictrum heliophilum*, Rio Blanco County, Colorado 2002.

Contacted References for *Spiranthes*: William F. Jennings, Louisville, Colorado

SECTION 2

WEST COAL CREEK LBA TRACT

E2-1.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

E2-1.1 The Proposed Action

On February 10, 2006, Ark Land Company (ALC) filed an application with the BLM to lease federal coal reserves in a tract located west of and immediately adjacent to the Coal Creek Mine (Figure E-1). The Coal Creek Mine is operated by Thunder Basin Coal Company (TBCC), a subsidiary of Arch Western Resources, LLC. In this EIS, ALC is referred to as the applicant and TBCC is referred to in discussions of mine operations. The West Coal Creek LBA tract was assigned case file number WYW172388. Under the Proposed Action the tract as applied for by ALC would be offered for lease at a sealed-bid, competitive lease sale. The boundaries of the tract would be consistent with the tract configuration proposed in the West Coal Creek LBA tract lease application (Figure E2-1). The Proposed Action assumes that ALC will be the successful bidder on the West Coal Creek LBA tract if it is offered for sale.

The legal description of the proposed West Coal Creek LBA tract coal lease lands as applied for by ALC under the Proposed Action is as follows:

T. 46 N., R. 70 W., 6th PM, Campbell County, Wyoming

Section 18: Lots 14 through 17;	161.95 acres
Section 19: Lots 7 through 10, 15 through 18;	323.60 acres
Section 30: Lots 5 through 20.	665.71 acres
Total:	<u>1,151.26 acres</u>

The coal estate underlying this tract described above is owned by the federal government and administered by the BLM. The surface estate of the tract is privately owned. Surface ownership is shown in Figure E2-2.

The tract as applied for includes approximately 1,151.26 mineable acres. It is assumed that an area larger than the tract would have to be disturbed in order to recover all of the coal in the tract. The disturbances outside of the tract would be due to activities like overstripping, matching undisturbed topography, and construction of flood control and sediment control structures.

Under the Proposed Action for the West Coal Creek LBA tract, if a decision is made to hold a competitive lease sale and if there is a successful bidder at that sale, a lease would be issued for the tract of federal coal as applied for. The tract offered for lease would be subject to standard and special lease stipulations developed for the Wyoming PRB. The stipulations that would be attached to a lease for the West Coal Creek LBA tract are listed in appendix D of the SGAC EIS document.

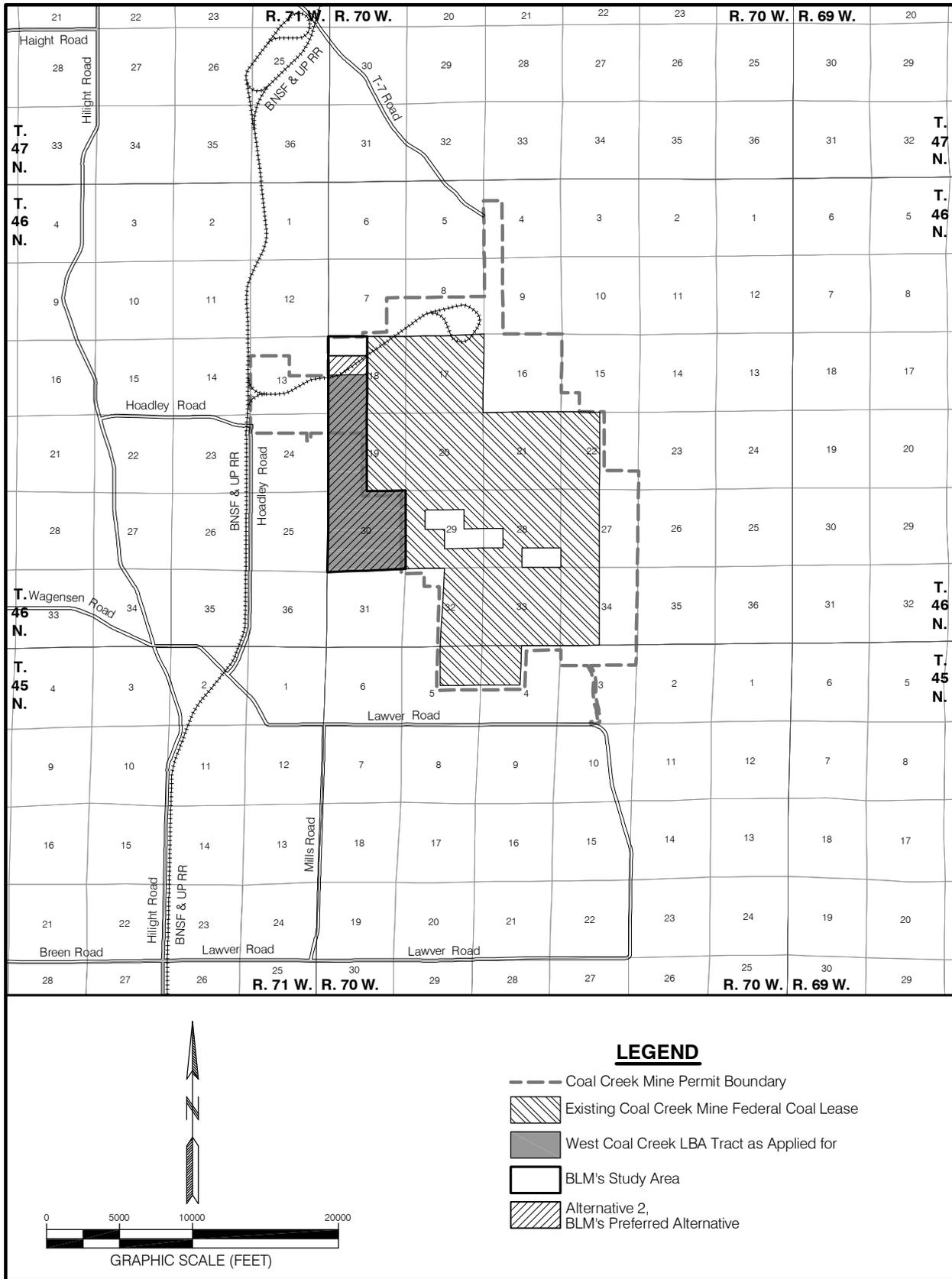


Figure E2-1. West Coal Creek LBA Tract Alternatives.

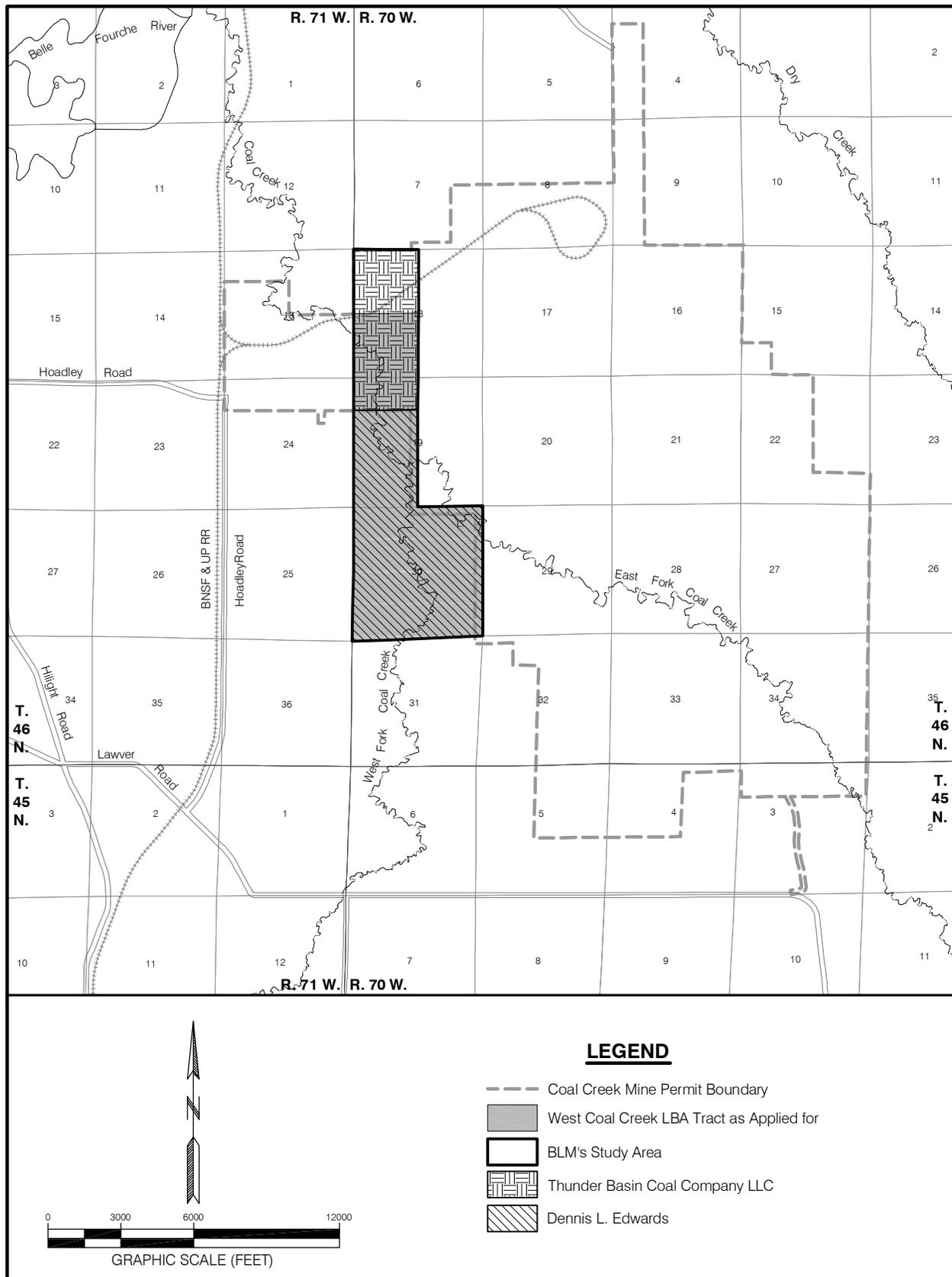


Figure E2-2. Surface Ownership Within the West Coal Creek LBA Tract Alternatives.

TBCC estimates that the West Coal Creek LBA tract under the Proposed Action includes approximately 63.3 million tons of in-place and mineable coal. Using TBCC's projected recovery factor of 90 percent, the tract would contain about 57.0 million tons of recoverable coal.

Under the Proposed Action, it is assumed that the LBA tract would be developed as a maintenance lease to extend the life of the adjacent existing Coal Creek Mine. As a result, under the Proposed Action, the coal included in the tract would be mined by existing employees using existing facilities and roads.

E2-1.2 Alternatives to the Proposed Action

E2-1.2.1 Alternative 1

Under Alternative 1, the No Action Alternative, the application to lease the coal included in the West Coal Creek LBA tract would be rejected, the tract would not be offered for competitive sale, and the coal included in the tract would not be mined. This would not affect permitted mining activities and employment on the existing leases at Coal Creek Mine and would not preclude an application to lease the federal coal included in the West Coal Creek LBA tract in the future. No additional surface of the West Coal Creek LBA tract would be disturbed due to overstripping to allow coal to be removed from the adjacent existing leases.

E2-1.2.2 Alternative 2

Under Alternative 2 for the West Coal Creek LBA tract, BLM would reconfigure the tract, hold one competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. The modified tract would be subject to standard and special lease stipulations developed for the PRB and this tract if it is offered for sale (appendix D). Alternative 2, holding a competitive coal sale for a modified tract, is BLM's Preferred Alternative.

Alternative 2 for the West Coal Creek LBA tract assumes that ALC would be the successful bidder on the tract if a lease sale is held and that the federal coal would be mined as a maintenance lease for the Coal Creek Mine. Assumptions concerning mining methods, facilities, hazardous materials, mitigation and monitoring requirements, etc. are the same as described for the Proposed Action.

As applied for, the West Coal Creek LBA tract consists of a single block of federal coal (Figure 1-3). In order to evaluate the potential that an alternate configuration of the tract would provide for more efficient recovery of the federal coal, increase competitive interest in the West Coal Creek LBA tract, and/or reduce the potential that some of the remaining unleased federal coal in this area would be bypassed in the future, BLM identified a study area. The

BLM study area includes the tract as applied for and unleased federal coal adjacent to the northern edge of the tract as applied for (Figure E2-1). Under this alternative, BLM could add some or all of the adjacent lands to the tract or BLM could reduce the size of the tract, as discussed in Section 2.0.

The area BLM is evaluating in addition to the tract as applied for includes the following lands:

T.46N., R.70W., 6th P.M., Campbell County, Wyoming

Section 18: Lots 7 through 10; 162.00 acres

The land description and acreage are based on the BLM Status of Public Domain Land and Mineral Titles approved Coal Plat as of August 8, 2006.

In identifying a study area, BLM included additional federal coal resources north of the current application area, as shown in Figure E2-1. BLM wanted to evaluate that federal coal in order to determine if it would be possible to economically recover additional coal in this area. After evaluating the tract configuration, BLM concluded that economic considerations preclude extending the West Coal Creek LBA tract in a north direction to the full extent of the study area due to the presence of the Coal Creek Mine railroad spur. BLM did not reduce the size of the tract because the modified tract was configured to allow recovery of the federal coal while maintaining the setback distances necessary to avoid the railroad spur. BLM did make a decision to add approximately 81 acres to the northern portion of the tract. Although most of the coal included in this addition to the tract would not be recoverable due to the required setback distances, including this coal in the tract would potentially allow more efficient recovery of the coal up to the required setback distance.

BLM's preferred tract configuration is to add approximately 81 acres to the northern edge of the tract as applied for (Figure E2-1). Under Alternative 2, BLM would add the following lands to the West Coal Creek LBA tract as applied for:

T.46N., R.70W., 6th P.M., Campbell County, Wyoming

Section 18: Lots 9 and 10; 80.91 acres

The legal description of BLM's preferred configuration of the West Coal Creek LBA tract under Alternative 2 is as follows:

T.46N., R.70W., 6th P.M., Campbell County, Wyoming

Section 18: Lots 7 through 10, 14 through 17; 242.86 acres

Section 19: Lots 7 through 10, 15 through 18; 323.60 acres

Section 30: Lots 5 through 20.

665.71 acres

Total:

1,232.17 acres

TBCC estimates that the reconfigured tract includes approximately 69.3 million tons of in-place coal and approximately 63.3 million tons of mineable coal. Using TBCC's projected recovery factor of 90 percent, the reconfigured tract would contain about 57.0 million tons of recoverable coal.

E2-2.0 SPECIES HABITAT AND OCCURRENCE AND EFFECTS OF THE PROPOSED PROJECT

The Coal Creek Mine began producing coal in 1982. Wildlife monitoring has been conducted annually for the mine since 1983. This wildlife monitoring was designed to meet the WDEQ/LQD, WGFD, and federal requirements for annual monitoring and reporting of wildlife activity on coal mining areas. Detailed procedures and site-specific requirements have been carried out as approved by WGFD and USFWS. The monitoring program was conducted in accordance with Appendix B of WDEQ/LQD Coal Rules and Regulations. Because the areas covered in the wildlife surveys included the mine's permit area and a large perimeter around the permit boundary, the entire West Coal Creek LBA tract has been included in baseline inventories and annual wildlife surveys conducted for the Coal Creek Mine since wildlife studies began.

The approved Coal Creek Mine Permit 483 Term T5 (TBCC 2006) includes monitoring and mitigation measures for the Coal Creek Mine that are required by Surface Mining Control and Reclamation Act and Wyoming State Law. If the West Coal Creek LBA tract is acquired by FCW, these monitoring and mitigation measures would be extended to cover operations on the LBA tract when the Coal Creek Mine's mining permit is amended to include the tract. This amended permit would have to be approved before mining operations could take place on the tract. These monitoring and mitigation measures are considered to be part of the Proposed Action and Alternative 2 during the leasing process because they are regulatory requirements.

Background information on T&E species in the vicinity of the West Coal Creek LBA tract was drawn from several sources, including: wildlife survey reports submitted by the Coal Creek Mine to the WDEQ/LQD from 1983 through 2006, the Final South Powder River Basin Coal EIS (BLM 2003), the Maysdorf Coal FEIS (BLM 2007), and from WGFD and USFWS records and contacts in 2006 and 2007. In addition, the entire West Coal Creek LBA tract and all but the southwestern corner of its corresponding two-mile perimeter wildlife study area fall within the wildlife monitoring areas for the nearby Cordero Rojo Mine (Figure E2-1).

Site-specific data for a substantial portion of the tract as applied for and the study area for Alternative 2 were obtained from several sources, including

WDEQ/LQD permit applications and annual wildlife reports for the Coal Creek Mine and other nearby coal mines. Baseline wildlife studies were conducted by Thunderbird-Jones & Stokes, (TJS) expressly for the West Coal Creek LBA tract during 2006 and 2007. Figure E2-3 depicts TJS's T&E animal species survey areas for the West Coal Creek LBA tract.

The West Coal Creek general analysis area is situated in an area of gently rolling terrain of moderate relief influenced by the East and West forks of Coal Creek. Elevations range from 4,555 to 4,710 ft within the LBA tract and from 4,580 to 4,725 ft within the area added under Alternative 2. Within the LBA tract and the area added under Alternative 2, slopes range from flat to over 33 percent, with the steeper slopes primarily occurring in the southern portion of the study area. The slopes of the gently rolling uplands, which comprise most (about 65 percent) of the BLM study area, seldom exceed 4.4 percent.

Predominant wildlife habitat types classified on the LBA tract and adjacent area correspond with the major plant communities defined during the vegetation baseline study and consist primarily of sagebrush/grassland and mixed grass prairie. Other habitats present in limited extent include streamside meadow and premine disturbance. Networks of road, pipeline, tank battery, and well-pad disturbance areas associated with oil and gas development overlay much of the study area.

All streams within and adjacent to the general analysis area are ephemeral. Storm runoff is typically of short duration and exhibits temporal patterns similar to the precipitation events. Streamflow is characteristically low to nonexistent from October through January. Streamflow frequently results from snowmelt during the late winter and early spring. Although peak discharges from such events are generally small, the duration and therefore the percentage of annual runoff volume can be considerable. During the spring, storms (both rain and snow) can result in both large runoff volumes and high peak discharges. Intense, short-duration summer thunderstorms also result in large runoff volumes and high peak discharges.

All streams draining the general analysis area are categorized as class 3B waters of the state by the WDEQ/Water Quality Division. No playas or topographic depressions have been identified within the general analysis area. Springs are uncommon in the general area and have not been identified in the general analysis area.

Four reservoirs used for livestock watering have been identified in the West Coal Creek general analysis area. None of these reservoirs have been permitted through the SEO. Most appear to have been in place for several decades. Three permitted sediment ponds (industrial and miscellaneous use) for the Coal Creek Mine are also located within the general analysis area. Each of these sediment ponds is associated with a WYPDES outfall.

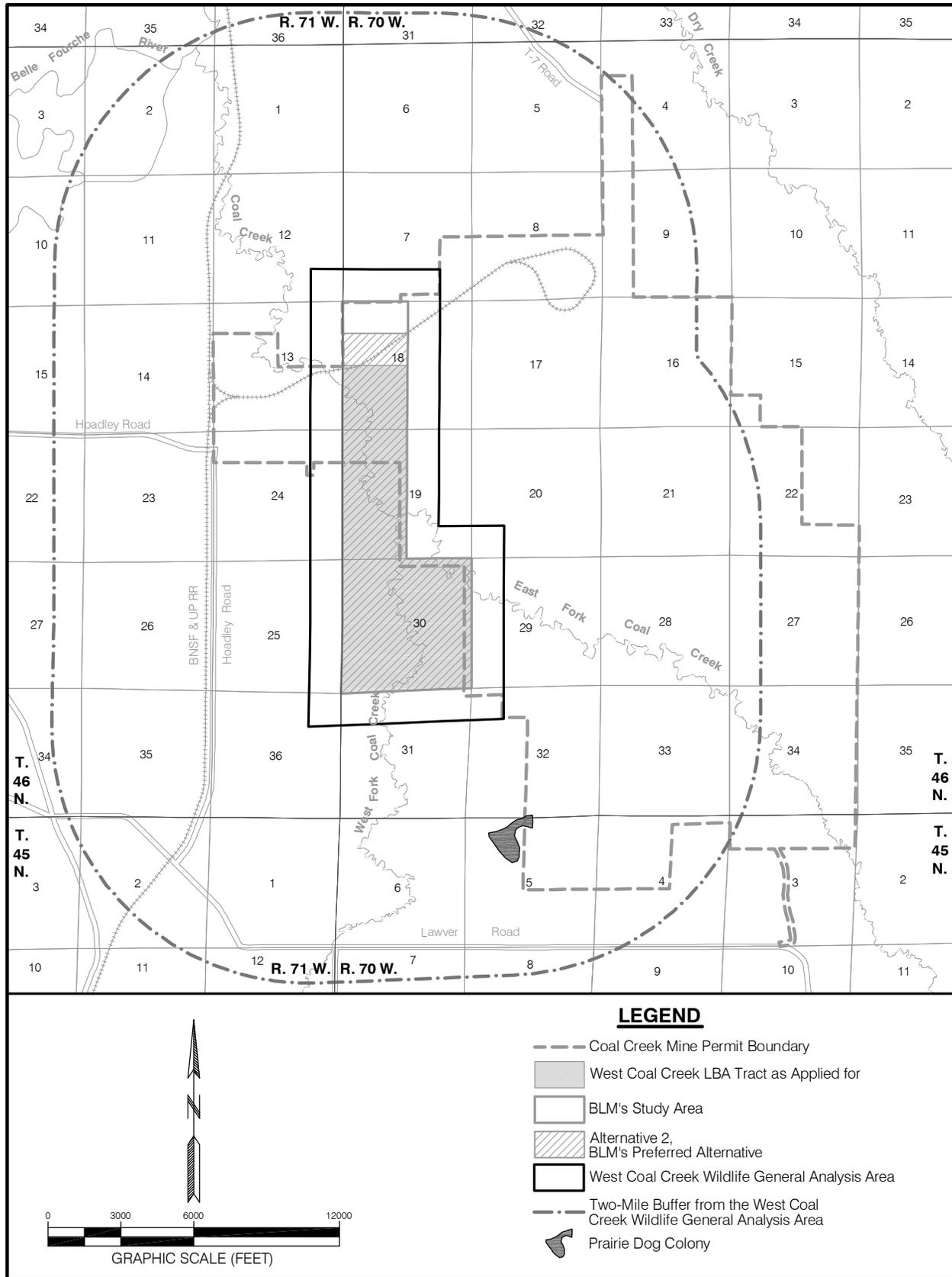


Figure E2-3. T&E Species Survey Area for the Coal Creek Mine and the West Coal Creek LBA Tract.

West Coal Creek LBA Tract Wetlands

A preliminary wetlands inventory, based on USFWS National Wetlands Inventory (NWI) mapping and vegetation mapping in the field, was conducted in 2004. The wetland analysis area includes the West Coal Creek LBA tract as applied for, the lands added under Alternative 2, and a ¼-mile disturbance buffer around the tract sufficient to mine and reclaim the tract as a part of the existing Coal Creek Mine operation. A formal wetland delineation has been confirmed by the U.S. Army Corps of Engineers (COE) for the portion of the LBA tract wetlands analysis area that is within the adjacent existing Coal Creek Mine permit area (TBCC 2006).

Coal Creek Mine conducted a preliminary wetlands inventory in 2007, based on USFWS NWI mapping and vegetation mapping in the field (BKS 2007), for the non-delineated portions of the wetlands analysis area. Some wetland areas previously mapped by the USFWS NWI project have been recently altered somewhat due to CBNG-related water production within and upstream of the West Coal Creek wetlands analysis area. The boundaries of the existing potential wetlands may vary to a greater or lesser extent from the boundaries shown on the NWI maps, and current field conditions may not be representative of the field conditions in the future. A formal wetland delineation survey of the lands proposed for mining disturbance would be conducted and submitted to the COE for verification as part of the mining and reclamation permit process, if the West Coal Creek LBA tract is leased and proposed for mining.

Based on the existing USFWS NWI mapping data (which may be somewhat outdated), the wetlands confirmed to be present within the adjacent Coal Creek Mine's permit area, and the vegetation mapping that was conducted in 2007, a total of approximately 16.92 acres of wetlands and other Waters of the U.S. occur within the West Coal Creek wetlands analysis area. The earlier wetland delineation confirmed by the COE identified a total of approximately 3.48 acres of wetlands, which are associated with the stream channels (both riverine- and palustrine marsh-types), within the wetlands analysis area. The 2007 preliminary wetlands survey identified approximately 13.44 acres of other Waters of the U.S., which were areas of open water held within the stream channels, or in-channel impoundments identified by NWI mapping that were found to be dry at the time. These areas that occur within and adjacent to the West Coal Creek LBA tract are shown on Figure S2-5 in the Supplementary Information document.

Within the proposed lease area and adjacent study area there is no "critical" habitat designated by USFWS for T&E species. The following discussion describes species' habitat requirements and their occurrence in the area of the West Coal Creek LBA tract and evaluates the potential environmental effects of the Proposed Action and Alternative 1 on federal T&E species.

E2-2.1 Threatened Species

E2-2.1.1 Ute ladies'-tresses

Ute ladies'-tresses is a perennial, terrestrial orchid with erect, glandular-pubescent stems 12 to 50 cm tall arising from tuberous-thickened roots. Ute ladies'-tresses occurs primarily on moist, subirrigated or seasonally flooded soils bordering wetland meadows, springs, lakes, or perennial streams. The elevation range of known occurrences is 4,200 to 7,000 feet in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows. Most populations are found on alluvial sand, coarse silt, or whitish loamy clay with a slightly basic pH. These soils are derived from Quaternary alluvial deposits or drab Eocene- age sandstones and claystones (Fertig 2000). Ute ladies'-tresses is not found in heavy, tight clay soils, saline, or alkaline soils.

This orchid can be commonly associated with horsetail, milkweed, verbena, blue-eyed grass, reedgrass, goldenrod, bentgrass, and arrowgrass (USFWS 2005). Wyoming populations often occur in moist meadow communities dominated by redtop, common quackgrass, Baltic rush, foxtail barley, or switchgrass within a narrow vegetative band between emergent aquatic vegetation and dry upland prairie (Fertig 2000). Vegetative cover tends to range from 75-90 percent and is usually less than 45 cm tall (Fertig 2000). The orchid seems intolerant of shade. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system.

In Wyoming, this species typically blooms from early August to early September, with fruits produced from mid-August to September (Fertig 2000). Leaves persist during flowering (Moseley 1998). Flowers are white or ivory and are clustered into a spike at the top of the stem. No direct observations of pollination have been made in Wyoming. In their 1994 report, Sipes and Tepedino indicated that large, long-tongued bumblebees in the genus *Bombus* are the primary pollinators in Utah and Colorado (Fertig 2000). Smaller bees may also visit these flowers, but have the incorrect body shape or mass to properly accommodate the orchid's large, sticky anther/pollen clusters (Fertig 2000).

This species reproduces basically by sexual reproduction and can produce as many as 7,300 tiny seeds per fruit (Fertig 2000). The plant requires mycorrhizal fungi to germinate and establish. Individual plants may not flower in consecutive years under adverse environmental conditions but will persist below ground with their mycorrhizal symbionts (Fertig 2000).

Flowers are needed for positive plant identification. The species can be reliably located only when it is flowering (Heidel 2001). Plants probably do not flower every year and may remain dormant below ground during drought years. In general, the species' best flowering years seem to correspond with extreme heat during flowering. Preliminary review of climate data also indicates that growing

seasons that start out as relatively cold and wet correspond with low flowering levels (Heidel 2001).

The orchid is well adapted to disturbances from stream movement and is tolerant of other disturbances such as grazing that are common to grassland riparian habitats (USFWS 1995). Populations are often dynamic and “move” within a watershed as disturbances create new habitat or succession eliminates old habitat (Fertig and Beauvais 1999). Ute ladies’-tresses colonize early successional riparian habitats such as point bars, sand bars, and low-lying gravelly, sandy, or cobbly edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing season. The orchid has been known to establish in heavily disturbed sites, such as revegetated gravel pits, heavily grazed riparian edges, and along well-traveled foot trails on old berms (USFWS 1995).

Existing Environment: Prior to 2005, four orchid populations had been documented within Wyoming, all discovered between 1993 and 1997 (Fertig and Beauvais 1999). Four additional sites were located in 2005 and one additional site was found in 2006 (Heidel, 2007). The new locations were in the same drainages or tributaries as the original four populations. Drainages with documented orchid populations include Antelope Creek and tributaries in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County. No occurrences have been recorded in Campbell County including the West Coal Creek vegetation general analysis.

Areas of potential habitat within the West Coal Creek LBA tract and adjacent study area were surveyed by BKS Environmental Associates, Inc during vegetation and wetland sampling in July 2007. The Coal Creek channel and its tributaries primarily had water present but for the most part lacked hydrophytic wetland vegetation or in some areas no vegetation was present along the steeply incised creek banks, with soils that primarily had clay textures.

Potential habitat was traversed on foot during the time of typical flowering of the known population, and it involved walking entire lengths of the drainages documenting locations of potential habitat and searching for this species.

No individuals of the Ute ladies’-tresses orchid were located during the 2007 survey. The land within the West Coal Creek LBA tract and adjacent study area is not potential suitable Ute ladies’-tresses habitat. This includes highly disturbed or modified sites, upland habitat types, and sites inundated by standing water. Poor habitat (3.48 acres of Riverine and palustrine wetland channel) within the study area is very limited and is mostly found along the CBNG-impacted bottomlands of the Middle and West Forks of Coal Creek. Poor habitat factors included areas within and immediately adjacent to stream channels and floodplains, less steep stream banks, light soil texture having close lateral or vertical distance (within approximately 18 inches) to perennial

water source during the flowering period, lack of plant competition, lack of general soil alkalinity/salinity, and current or historical management practices that did not promote overgrazing and extensive use of riparian areas.

As discussed above, a total of approximately 16.92 acres of wetlands and other Waters of the U.S. occur within the West Coal Creek wetlands analysis area.

Effects of the Proposed Project: Mining the federal coal included in the West Coal Creek LBA tract, if the tract is leased under the Proposed Action or Alternative 1, may affect, but is not likely to adversely affect Ute ladies'-tresses. Potential habitat for this species on the tract is very limited and found along the CBNG-impacted bottomlands of West Fork, Middle Fork, and East Fork Coal Creek. However, the quality of potential habitat is extremely poor. Outside of the narrow riparian strips located along these impacted watercourses, potential habitat is rare or non-existent in the study area. Multiple surveys of the existing habitat at the Coal Creek Mine and other mines in this area have not found any Ute ladies'-tresses. Because of the ability of this species to persist below ground or above ground without flowering, single season surveys that meet the current USFWS survey guidelines may not detect populations. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for Ute ladies'-tresses within the project area should be identified and surveyed prior to surface mining activities.

Jurisdictional wetlands located in the West Coal Creek LBA tract that are destroyed by mining operations would be replaced in accordance with the requirements of Section 404 of the Clean Water Act, as determined by COE. The replaced wetlands may not duplicate the exact function and landscape features of the pre-mine wetlands. COE considers the type and function of each jurisdictional wetland that will be impacted and may require restoration of additional acres if the type and function of the restored wetlands will not completely replace the type and function of the original wetland. Replacement of non-jurisdictional and functional wetlands may be required by the surface land owner and/or WDEQ/LQD. WDEQ/LQD allows and sometimes requires mitigation of non-jurisdictional wetlands affected by mining, depending on the values associated with the wetland features.

Cumulative Effects: Alterations of stream morphology and hydrology are believed to have extirpated Ute ladies'-tresses from most of its historical range (USFWS 2002). Disturbance and reclamation of streams by surface coal mining may alter stream morphology and hydrology. The large quantities of water produced with CBNG development and discharged on the surface may also alter stream morphology and hydrology.

E2-2.2 Endangered Species

E2-2.2.1 Black-footed ferret

The black-footed ferret, a nocturnal mammal and an obligate associate of prairie dogs (*Cynomys* spp.), was listed as endangered in March, 1967. This species is thought to have historically inhabited a nearly contiguous matrix of prairie dog colonies spanning the short-grass prairies of the eastern and southern Rockies and the Great Plains of North America (Forrest et al. 1985). Since the early 1930s, numerous factors have led to substantial declines in prairie dog colonies in that region. Reductions in some states are estimated as high as 90% from formerly occupied colonies (Rose 1973, Tyler 1968).

Conversion of grasslands to agricultural landscapes, eradication of prairie dogs, and diseases such as the plague and canine distemper have resulted in severe reductions in prairie dog colonies across the west, colonies which provided food, shelter, and habitat for black-footed ferrets. This species of ferret is currently one of the most endangered mammals in North America and was thought to be extinct until a small population was discovered in Meeteetse, Wyoming in September, 1981. Since then, successful captive breeding and reintroduction programs have released black-footed ferrets back into the wild in several western and Great Plains states including Wyoming, Montana, South Dakota, Colorado, Utah, and Arizona.

Biology and Habitat Requirements: Ferrets rely on prairie dogs to provide both shelter and food (Hillman and Clark 1980). Ferrets produce one litter per year, typically giving birth to four or five kits. The decline in ferret populations has been largely attributed to the reduction in the vast prairie dog colonies that historically existed in the western United States. Despite extensive ferret surveys over the past 20 plus years throughout Wyoming, the last known wild black-footed ferret population was discovered near Meeteetse in 1981 (Miller et al. 1996). Those surveys included numerous USFWS-approved clearances for coal mining and other development in the Powder River Basin of Wyoming, as well as the USFS surveys for ferrets on the TBNG. Reintroduction efforts involving captive bred individuals have successfully established one black-footed ferret population in the Shirley Basin area in south-central Wyoming. Currently, this is the only known black-footed ferret population within the state, though other populations are present elsewhere in the United States and Mexico.

Existing Environment: Few ferrets have historically been recorded in locations away from prairie dog colonies. The Coal Creek Mine and LBA study area are beyond the focus area for ferret reintroduction efforts on the nearby Thunder Basin National Grassland and elsewhere in the general region (USFS 2002, Grenier 2003). One small (approximately 34 acres) prairie dog colony is present just south of the BLM study area and its one-mile perimeter (Figure E2-3). As indicated, that colony does not meet the 80-acre minimum, nor does it fall within a larger complex of colonies, to be considered as potential black-

footed ferret habitat by the USFWS (1989). Likewise, the colony does not provide sufficient habitat to persistently support individuals or breeding females, whose needs are estimated to be at least 30 and 123.5 acres, respectively (Forrest et al. 1985). Ferrets have never been documented at Coal Creek Mine or in the surrounding region during surveys conducted over the last 20 plus years by a variety of private, state, and federal entities. The lack of black-footed ferret observations and scat in the BLM study area leads to the conclusion that ferrets are not present in the area. On 2 February 2004, the USFWS declared that surveys for black-footed ferrets are no longer required in black-tailed prairie dog colonies throughout Wyoming (file letter ES-61411/BFF/WY7746).

Effects of the Proposed Project: Mining the federal coal included in the West Coal Creek LBA tract, should the tract be leased under the Proposed Action Alternative, will have no effect on black-footed ferrets. Given the documented absence of this species in the region, including the LBA study area, during specific surveys for this species, the isolated nature and small size of the lone colony within the LBA survey area, the block clearance issued by the USFWS for black-tailed prairie dog colonies throughout the entire state, and the location of the LBA area beyond future reintroduction sites, mining the LBA area will not result in any direct or indirect effects on black-footed ferrets.

Cumulative Effects: As indicated, coal mining and natural gas development have occurred in the general project area for more than 20 years, with energy extraction activities expected to increase in the immediate future. Leasing and mining the West Coal Creek LBA tract would not contribute to cumulative adverse effects to black-footed ferrets within either the study area or region. No black-footed ferret populations exist within northeastern Wyoming. The USFWS issued a block clearance for this species in black-tailed prairie dog colonies throughout the state. The LBA study area and surrounding perimeter are beyond the focus area for future ferret reintroduction efforts in the general region (USFS 2002, Grenier 2003). Furthermore, the Proposed Action Alternative would not conflict with any future objectives to manage the area for, or reintroduce black-footed ferrets into, northeast Wyoming.

Potential ferret habitat is also affected by other impacts to prairie dog populations. Plague can infect and eliminate entire prairie dog colonies. Poisoning and recreational prairie dog shooting may locally reduce prairie dog populations, but seldom completely eliminate colonies.

E2-2.2.2 Blowout Penstemon

Blowout Penstemon, a member of the figwort family, was listed as endangered on October 1, 1987. It is known from multiple populations in western Nebraska and in the Ferris dunes area in northwestern Carbon County, Wyoming. The plant was first discovered in Wyoming in 1877 and then rediscovered in 1996 (BLM 2008). The removal of fire, leveling of dunes, reduction of grazing, and cultivation of stabilizing cover crops drastically

reduced the amount of habitat available for this species. Loss of habitat, coupled with impacts from insect outbreaks, drought, inbreeding, and potential over collection, has caused problems for the plant (University of Wyoming 2009). Only 3,500-5,000 plants are currently found in Nebraska at about a dozen sites. The Wyoming population is limited to three sites in northern Carbon County that contain several thousand plants (BLM 2008). Threats to the plant may occur when sand dunes are removed or overly disturbed by vehicular traffic (USFWS 2008b).

Biology and Habitat Requirements: Blowout penstemon is a perennial herb with stems less than 12 inches tall. The inflorescence is 2 to 6 inches long and has six to ten compact whorls of milky-blue to pale lavender flowers. This species typically flowers from mid-June to early-July. The plant's current know range in Wyoming is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25 to 40 percent vegetative cover (USFWS 2008b).

Existing Environment: The West Coal Creek LBA tract is not within the documented historical range of the blowout penstemon. It is located approximately 150 miles northwest of the Nebraska known occurrences and approximately 150 miles northeast of the Wyoming occurrences. No suitable sand dunes (whether stable or blownout) are currently present on the West Coal vegetation general analysis area.

Effects of the Proposed Project: **Mining the federal coal included in the Belle Ayr North LBA tract, if a lease is issued under the Proposed Action or Alternative 2, would have no effect on blowout penstemon.** Typical suitable habitat for this species on the tract is non-existent. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for blowout penstemon within the project area should be identified and surveyed prior to surface mining activities.

Cumulative Effects: This species is potentially vulnerable to habitat loss and degradation resulting from sand mining, water development, energy development, ORV use, and associated destabilization of its sand dune habitat. It also could be vulnerable to negative effects related to the spread of non-native species within its range.

E2-3.0 SUMMARY OF DETERMINATIONS

Table E2-1 summarizes the determinations for federally listed T&E species in the area of the West Coal Creek LBA tract that may result from implementing the Proposed Action or Alternative.

Appendix E

Table E2-1. Effects Evaluation of Sensitive and Federal T&E Species in the Area of the West Coal Creek LBA Tracts.

Status	Species Common Name	Potential Effects
Threatened:	Ute ladies'-tresses	May affect ¹
Endangered:	Black-footed ferret	No effect
Endangered:	Blowout Penstemon	No effect

¹ Not likely to adversely affect individuals or populations.

E2-4.0 CREDENTIALS OF SURVEY PERSONNEL

E2-4.1 Jones & Stokes of Gillette, Wyoming

Gwyn McKee

Ms. McKee obtained a Master of Science degree in Wildlife Ecology/Management from the University of Missouri-Columbia. She has accumulated nearly 20 years of professional experience, with the last 14 spent working with the energy industry in Wyoming, Montana, and South Dakota. Ms. McKee has conducted the wildlife surveys and impact analyses for most of the surface coal mines in the Powder River Basin during her tenure in Wyoming, including two of the three properties analyzed in the South Gillette Area Coal EIS. She has also provided and/or reviewed the pertinent text related to impact assessments for vertebrate species of concern for most of the coal EISs that have been prepared in the Powder River Basin since 2000.

Jennifer Ottinger

Ms. Ottinger received a B.S. in Zoology from Colorado State University in 1993, with a minor in Microbiology. She has 12 years of professional experience with a variety of vertebrate species, including surveys for sage-grouse and mountain plovers, though her work has focused on raptors during that period. Ms. Ottinger has worked throughout the U.S. and abroad. She joined Jones & Stokes as a Wildlife Biologist in 2004. She has strong raptor identification and handling skills, research experience, proven abilities in data analysis and technical writing, and has presented and/or published several articles in a variety of professional meetings and publications, respectively.

E2-4.2 BKS Environmental Associates, Inc of Gillette, Wyoming

Dr. Brenda K. Schladweiler

Dr. Brenda K. Schladweiler obtained her Ph.D. in Soil Science from the University of Wyoming, 2003. M.S. in Soil Science from University of Wyoming 1995, and B.S. Range Management (Land Rehabilitation) from Colorado State University, Fort Collins, Colorado 1980.

Dr. Schladweiler has extensive experience over the last 26 years in conducting rare plant surveys. The following is a list of recent threatened and endangered plant studies she has conducted:

Location	Date	Plants Surveyed
Wharf Mine, Lawrence Co., SD	1992	Various, State of SD Heritage Plants
Ferris Haggerty Mine, Carbon Co., WY	1998	Various, State of WY
Crow AML, Big Horn Co., MT	1999	Various, State of MT
Caballo Mine	1999	<i>Spiranthes diluvialis</i>
Wright Clinic AML, Campbell Co., WY	1999	<i>Spiranthes diluvialis</i>
Kane Environmental, Campbell Co., WY	1999	<i>Spiranthes diluvialis</i>
Atlantic City Mine, Knight Piesold, Fremont Co., WY	2000	<i>Spiranthes diluvialis</i>
Eagle Butte Mine, Campbell Co., WY		<i>Spiranthes diluvialis</i>
West Antelope Mine, Converse Co., WY	2001	<i>Spiranthes diluvialis</i>
BRS, Bighorn Basin Water Project, Washakie Co., WY	2001	Various, State of Wyoming Plant
URS, Transmission Line, Campbell Co., WY	2001	<i>Spiranthes diluvialis</i>
Wright, (bike path) Campbell Co., WY	2001	<i>Spiranthes diluvialis</i>
Gillette, PCA sewer line, Campbell Co., WY	2002-2004	<i>Spiranthes diluvialis</i>
Gillette, PCA trunk line, Campbell Co., WY	2002-2004	<i>Spiranthes diluvialis</i>
Pinehaven (Wester-Wetstein), Crook Co., WY	2003	<i>Spiranthes diluvialis</i>
Spotted Horse, (CBMA CH4), Campbell Co., WY	2003	<i>Spiranthes diluvialis</i>
Bowers Oil (Antelope Creek)Campbell/ Converse Co., WY	2003	<i>Spiranthes diluvialis</i>
Gillette, PCA Swanson Rd., Campbell Co., WY	2003	<i>Spiranthes diluvialis</i>
North Rochelle Mine USFS Survey, Campbell Co., WY	2004	Various USFS Sensitive Species for TBNG
Westport Oil & Gas, Nicholson POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy, Mustang POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
NARM, Beckwith Rd., Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Yates Petroleum, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i> ; various USFS Sensitive Species for TBNG
PRCC, Ridgeroad USFS, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Lance, Black Thunder POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy, Mulie POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy Whitetail POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy, Bighorn POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>

Numerous actions have been taken by Dr. Schladweiler to become acquainted with the known locations and the appearance of *Spiranthes diluvialis*. Research has been conducted through the Wyoming Natural Diversity Database and the Internet for sensitive plants. In addition, she has actually visited the population on the Unnamed Tributary to Antelope Creek numerous times over the last approximate 10 years. This known population verification was completed as part of a field survey conducted for Yates Petroleum Company in the Rochelle Hills POD, Campbell County, Wyoming on August 29, 2004. She has also visited the known population near Chugwater, Wyoming.

Dr. Schladweiler on numerous occasions has been in contact with Mr. Ernie Nelson, University of Wyoming, Rocky Mountain Herbarium, and George Jones, Wyoming Natural Diversity Database. In addition, she has consulted with Mr. Walt Fertig, previously from the University of Wyoming.

Katie Halvorson

Katie Halvorson holds a B.S. in Environmental Studies with a minor in Biology from Bemidji State University, Bemidji, Minnesota (2005). Ms. Halvorson has been employed by BKS Environmental since the spring of 2005. She has been conducting mineland reclamation monitoring for various coal mines in Campbell and Converse County, Wyoming since her employment. She has also performed vegetation sampling for numerous CBM projects and baseline vegetation surveys in the Powder River Basin. In addition, she has conducted rare plant species surveys, wetland delineations, and environmental compliance assessments. Threatened, endangered, proposed and sensitive plant survey experience includes:

- Visited a tributary of Antelope Creek and observed a *Spiranthes diluvialis* (Ute Ladies' Tresses orchid) population. 2005.
- Powder River Coal LLC – North Antelope Rochelle Mine Umbrella Botany Evaluation, in Campbell County, Wyoming. 2005.
- Powder River Coal LLC – Gold Mine Draw AVF Exchange – Ute Ladies' Tresses orchid survey, in Campbell County, Wyoming. 2005.
- West Roundup Resources, Inc. – School Creek Mine – Ute Ladies' Tresses orchid survey in Campbell County, Wyoming. 2005 and 2006.
- Devon Energy Corporation – Juniper Draw Unit – Ute Ladies' Tresses orchid survey in Johnson County, Wyoming. 2005.
- Devon Energy Corporation – Crossroads Unit – Ute Ladies' Tresses orchid survey in Johnson County, Wyoming. 2005.
- Marathon Oil Company – Knudson 9 Unit – Ute Ladies' Tresses orchid survey in Campbell County, Wyoming. 2006.
- Marathon Oil Company – Twenty Mile Butte Unit – Ute Ladies' Tresses orchid survey in Campbell County, Wyoming. 2006.
- Marathon Oil Company – West Innes 27 Unit – Ute Ladies' Tresses orchid survey in Campbell County, Wyoming. 2006.
- Rio Tinto Energy America – Antelope Mine – Ute Ladies' Tresses orchid habitat survey in Converse County, Wyoming. 2007.

Cindy Robinson

Cindy Robinson holds a Masters of Business Administration (MBA) and a B.S. in Environmental Science from the University of Denver, Denver, Colorado (2005). Ms. Robinson has been employed by BKS Environmental since April of 2006. She has been conducting mineland reclamation monitoring for various coal mines in Campbell County, Wyoming during the last year. In addition, she has conducted rare plant species surveys, wetland delineations, and environmental compliance assessments. Ms. Robinson has also visited an *Astragalus barrii* site, on USFS lands at the proposed School Creek Mine area when the species was blooming. Threatened and endangered and sensitive plant survey experience includes:

- West Roundup Resources, Inc., - School Creek Mine - Barr's Milkvetch survey in Campbell County, Wyoming, 2006.
- West Roundup Resources, Inc., - School Creek Mine - Ute Ladies' Tresses orchid survey in Campbell County, Wyoming, 2006.
- Thunder Basin Coal Company, Black Thunder Mine - West Hilight - Barr's Milkvetch survey, August 2006.
- Wellstar Corporation (Jones and Stokes), Ute Ladies Tresses orchid survey, 2007.

Jamie Eberly

Jamie Eberly holds a B.S. in Range Management, Rangeland Livestock Option with a Business Administrations minor from Chadron State College, Chadron, Nebraska (2005). Ms. Eberly has been employed by BKS Environmental since the fall of 2006. She has been conducting mineland reclamation monitoring for various coal mines in Campbell and Converse County, Wyoming since her employment. She has also performed vegetation sampling for numerous CBM projects and baseline vegetation surveys in the Powder River Basin. In addition, she has conducted rare plant species surveys, wetland delineations, and environmental compliance assessments. Threatened, endangered, proposed and sensitive plant survey experience includes:

- Williams Production Company, West Cripple Creek POD, Biological Evaluation/Biological Assessment in Campbell County, Wyoming. 2007.

SECTION 3

CABALLO WEST LBA TRACT

E3-1.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

E3-1.1 The Proposed Action

On March 15, 2006, Caballo Coal Company (CCC) filed an application with the BLM to lease federal coal reserves in a tract located west of and immediately adjacent to the Caballo Mine (Figure E-1). The tract was assigned case file number WYW172657. Under the Proposed Action for the Caballo West LBA tract, the tract as applied for by CCC would be offered for lease at a sealed-bid, competitive lease sale. The boundaries of the tract would be consistent with the tract configuration proposed in the Caballo West LBA tract lease application (Figure E3-1). The Proposed Action assumes that CCC will be the successful bidder on the Caballo West LBA tract if it is offered for sale.

The legal description of the proposed Caballo West LBA tract coal lease lands as applied for by CCC under the Proposed Action is as follows:

T. 48 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 7: Lots 12, 19;	81.88 acres
Section 8: Lot 10;	39.67 acres
Section 17: Lots 1 through 10, 11 (N $\frac{1}{2}$, SE $\frac{1}{4}$), 12 (NE $\frac{1}{4}$), 15 (N $\frac{1}{2}$, SE $\frac{1}{4}$), 16;	521.76 acres
Section 18: Lot 5, 12 (NE $\frac{1}{4}$);	52.32 acres
Section 20: Lots 1, 2 (NE $\frac{1}{4}$), 8 (N $\frac{1}{2}$, SE $\frac{1}{4}$).	<u>81.86 acres</u>
Total:	777.49 acres

The coal estate underlying this tract described above is owned by the federal government and administered by the BLM. The surface estate of the tract is privately owned. The federal surface estate is administered by BLM. Surface ownership is shown in Figure E3-2.

The tract as applied for includes approximately 777.49 mineable acres. It is assumed that an area larger than the tract would have to be disturbed in order to recover all of the coal in the tract. The disturbances outside of the tract would be due to activities like overstripping, matching undisturbed topography, and construction of flood control and sediment control structures.

CCC estimates that the tract as proposed includes approximately 98.2 million tons of in-place coal and 87.5 million tons of mineable coal. Using CCC's

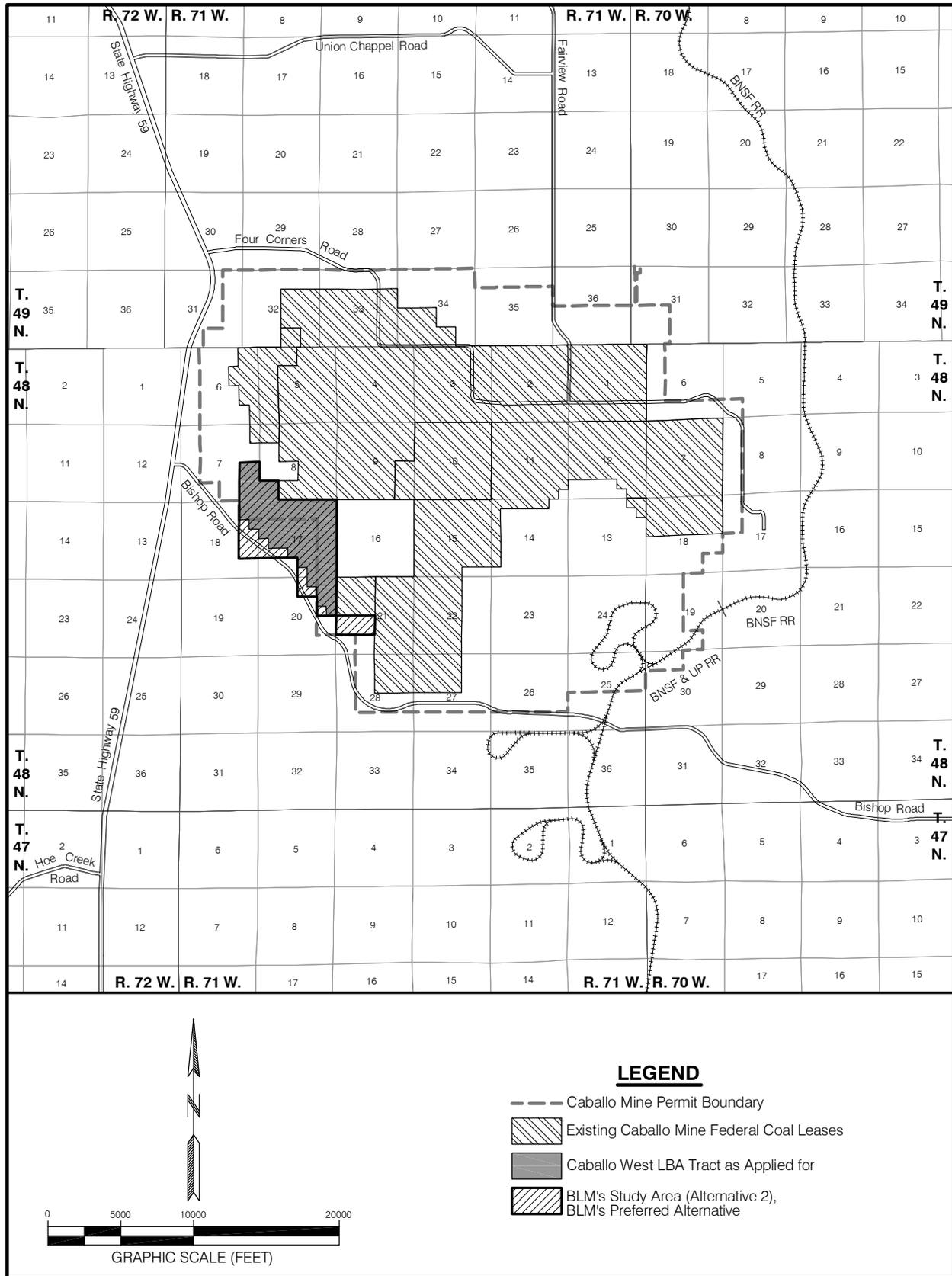


Figure E3-1. Caballo West LBA Tract Alternatives.

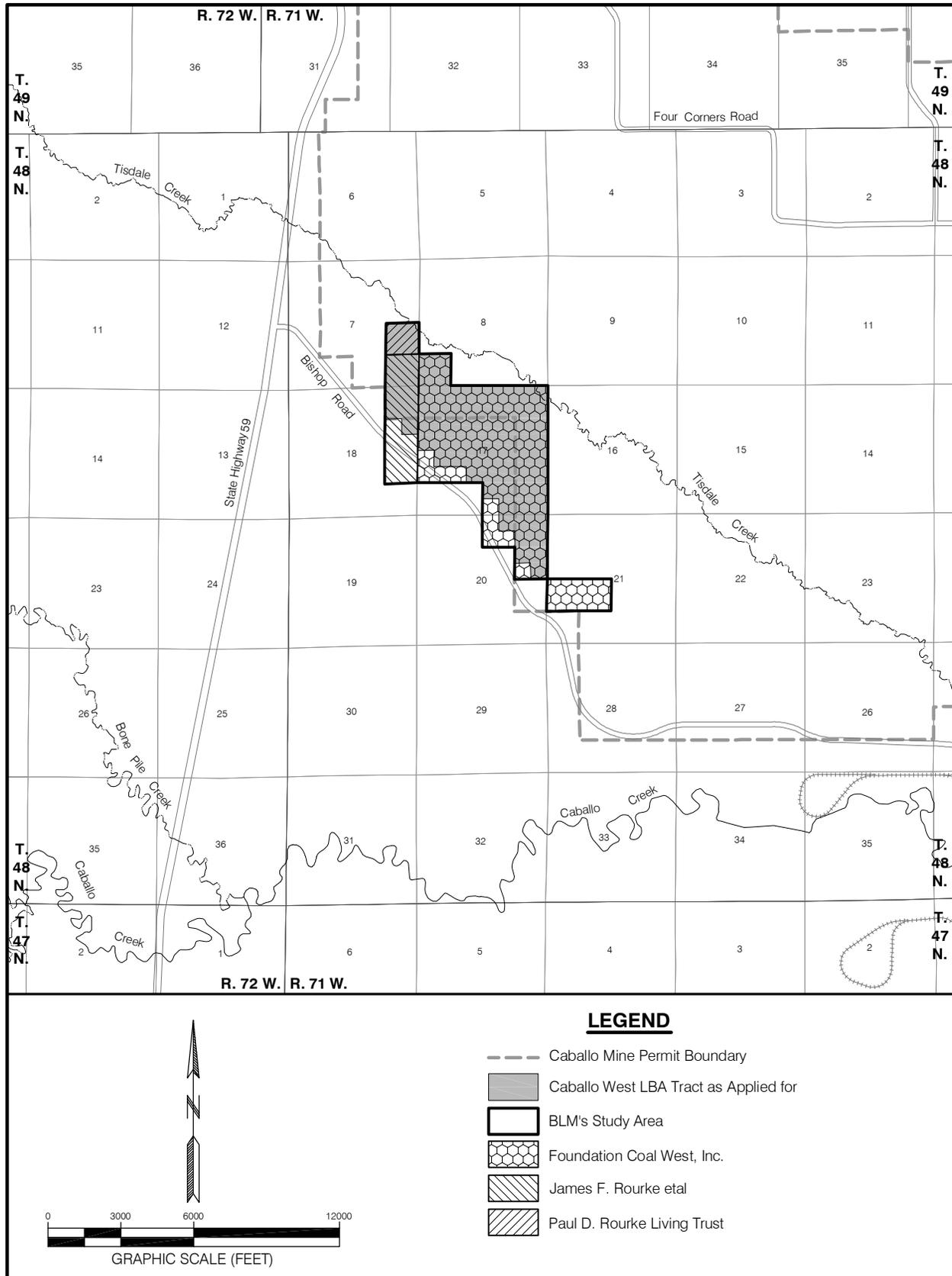


Figure E3-2. Surface Ownership Within the Caballo West LBA Tract Alternatives.

projected recovery factor of 93.5 percent, the tract would contain about 81.8 million tons of recoverable coal.

E3-1.2 Alternatives to the Proposed Action

E3-1.2.1 Alternative 1

Under Alternative 1, the No Action Alternative, the application to lease the coal included in the Caballo West LBA tract would be rejected, the tract would not be offered for competitive sale, and the coal included in the tract would not be mined. This would not affect permitted mining activities and employment on the existing leases at Caballo Mine and would not preclude an application to lease the federal coal included in the Caballo West LBA tract in the future. No additional surface of the Caballo West LBA tract would be disturbed due to overstripping to allow coal to be removed from the adjacent existing leases.

E3-1.2.2 Alternative 2

Under Alternative 2 for the Caballo West LBA tract, BLM would reconfigure the tract, hold a competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. In evaluating the Caballo West coal lease application, BLM identified a study area, which includes unleased federal coal adjacent to the southwestern edge of the tract as applied for (Figure E3-1). BLM is evaluating the potential that some or all of these lands could be added to the tract to provide for more efficient recovery of the federal coal, increase competitive interest in the tract, and/or reduce the potential that some of the potentially mineable federal coal in this area would be bypassed in the future if it is not included in the Caballo West LBA tract. The modified tract would be subject to standard and special lease stipulations developed for the PRB and this tract if it is offered for sale, as discussed above. Alternative 2, holding a competitive coal sale for a modified tract, is BLM's Preferred Alternative.

Alternative 2 for the Caballo West LBA tract assumes that CCC would be the successful bidder on the tract if a lease sale is held and that the tract would be developed as a maintenance lease to extend the life of the adjacent Caballo Mine. Other assumptions are the same as for the Proposed Action. The lands that BLM is considering adding to the tract are:

T. 48 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 17: Lots 11 (SW ¹ / ₄), 12 (NW ¹ / ₄ , S ¹ / ₂), 15 (SW ¹ / ₄);	51.42 acres
Section 18: Lot 12 (NW ¹ / ₄ , S ¹ / ₂), 13;	72.82 acres
Section 20: Lots 2 (NW ¹ / ₄ , S ¹ / ₂), 8 (SW ¹ / ₄);	41.02 acres
Section 21: Lots 11, 12.	<u>81.25 acres</u>

Total: 246.51 acres

The legal description of BLM’s reconfiguration of the Caballo West LBA tract under Alternative 2 is as follows:

T. 48 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 7: Lots 12, 19;	81.88 acres
Section 8: Lot 10;	39.67 acres
Section 17: Lots 1 through 12, 15, 16;	573.18 acres
Section 18: Lot 5, 12, 13;	125.14 acres
Section 20: Lots 1, 2, 8.	122.88 acres
Section 21: Lots 11, 12.	<u>81.25 acres</u>
 Total:	 1,024.00 acres

Some of the coal in Caballo West LBA tract under this alternative is not currently considered to be mineable due to the presence of the Bishop Road (County Road 12). A portion the Bishop Road overlies some of the coal included in the tract under Alternative 2. As discussed in Chapter 1, Section 1.1, the Surface Mining Control and Reclamation Act prohibits mining within 100 ft on either side of the right-of-way of any public road (43 CFR 3461). There would also be a quantity of coal south of the Bishop Road that would be isolated from the mining operations if the coal under the road was not mined. The coal underlying the portion of the Bishop Road, its right-of-way, and the estimated layback needed on both sides of the county road to safely recover the coal (including the 100 ft buffer zone) within the Caballo West LBA tract under Alternative 2 could be mined if the Campbell County Board of Commissioners, the authorized agency, determines that the road can be moved [30 CFR 761.11(d)]. CCC is evaluating the feasibility of relocating the road at this time.

CCC estimates that the reconfigured tract includes approximately 131.4 million tons of in-place coal and approximately 98.1 million tons of mineable coal. Using CCC’s projected recovery factor of 93.5 percent, the reconfigured tract would contain about 91.7 million tons of recoverable coal.

E3-2.0 SPECIES HABITAT AND OCCURRENCE AND EFFECTS OF THE PROPOSED PROJECT

The Caballo Mine began producing coal in 1978. Wildlife monitoring has been conducted annually for the mine since 1986. This wildlife monitoring was designed to meet the WDEQ/LQD, WGFD, and federal requirements for annual monitoring and reporting of wildlife activity on coal mining areas. Detailed

procedures and site-specific requirements have been carried out as approved by WGFD and USFWS. The monitoring program was conducted in accordance with Appendix B of WDEQ/LQD Coal Rules and Regulations. Because the areas covered in the wildlife surveys included the mine's permit area and a large perimeter around the permit boundary, the entire Caballo West LBA tract has been included in baseline inventories and annual wildlife surveys conducted for the Caballo Mine since wildlife studies began in the early 1970s.

The approved Caballo Mine Permit 433 Term T5 (CCC 2003) includes monitoring and mitigation measures for the Caballo Mine that are required by Surface Mining Control and Reclamation Act of 1977 (SMCRA) and Wyoming State Law. If the Caballo West LBA tract is acquired by CCC, these monitoring and mitigation measures would be extended to cover operations on the LBA tract when the Caballo Mine's mining permit is amended to include the tract. This amended permit would have to be approved before mining operations could take place on the tract. These monitoring and mitigation measures are considered to be part of the Proposed Action and Alternative 2 during the leasing process because they are regulatory requirements.

Background information on T&E species in the vicinity of the Caballo West LBA tract was drawn from several sources, including: wildlife survey reports submitted by the Caballo Mine to the WDEQ/LQD from 1974 through 2005, the Final South Powder River Basin Coal EIS (BLM 2003), the Final South Powder River Basin Coal EIS (BLM 2003), the Maysdorf Coal FEIS (BLM 2007), a Wyoming Natural Diversity Database search (University of Wyoming 2001), and from WGFD and USFWS records and contacts in 2004 and 2005. In addition, the Caballo West LBA tract wildlife study area falls within the wildlife monitoring area for the nearby Belle Ayr Mine (Figure E3-1).

Site-specific data for a substantial portion of the tract as applied for and the study area for Alternative 2 were obtained from several sources, including WDEQ/LQD permit applications and annual wildlife reports for the Caballo Mine and other nearby coal mines. Baseline wildlife studies were conducted by Thunderbird-Jones & Stokes, (TJS) expressly for the Caballo West LBA tract beginning in April of 2004 and continuing through December of 2004. Figure TJS surveyed T&E animal species within 2 miles of the Caballo West LBA tract.

The Caballo West LBA tract is in an area of gently rolling terrain of moderate relief influenced by Tisdale Creek and its tributaries. Elevations range from 4,532 to 4,704 ft within the LBA tract and from 4,532 to 4,572 ft within the area added under Alternative 2. Within the LBA tract and the area added under Alternative 2, slopes range from flat to over 26 percent in the central portion of the tract. The slopes of the gently rolling uplands, which comprise most (about 60 percent) of the LBA tract, seldom exceed 4.5 percent. A slope analysis would be done for the LBA tract if a lease sale is held and it is proposed for mining.

Predominant wildlife habitat types classified on the LBA tract and adjacent area correspond with the major plant communities defined during the vegetation baseline study and consist primarily of big and silver sagebrush, cropland, and grassland. Other habitats present in limited extent include disturbance and bottomlands. Networks of road, pipeline, tank battery, and well-pad disturbance areas associated with oil and gas development overlay much of the study area.

The Caballo West LBA tract consists predominantly of upland topography between Tisdale and Caballo Creeks, although a portion of Tisdale Creek overlies an AVF. Tisdale Creek flows roughly east-southeast through the northern portion of the tract. Tisdale Creek is now interrupted to the north of the Caballo West LBA tract by Caballo's T7 Reservoir, from where water is pumped around the mine to Gold Mine Draw. Gold Mine Draw and North Tisdale Creek are tributaries to Tisdale Creek, which is a tributary to Caballo Creek and the Belle Fourche River.

All streams, including Tisdale Creek, within and adjacent to the tract are typical for the region, in that flow events are ephemeral. Stream runoff is typically of short duration and exhibits temporal patterns similar to precipitation events. All streams in the region show the characteristic extreme low-flow period from October through January. Flow events frequently result from snowmelt during the late winter and early spring. Although peak discharges from such events are generally small, the duration and corresponding percentage of annual runoff volume can be considerable. During the spring, general storms (both rain and snow) increase soil moisture which decreases infiltration capacity, and subsequent rainstorms can result in both large runoff volumes and high peak discharges. Portions of Tisdale Creek downstream of the Caballo Mine receive recharge from bank storage (groundwater stored in the alluvium and bedrock along the stream channel) creating intermittent reaches.

Caballo West LBA Tract Wetlands

Wetland inventories have been completed and confirmed by the U.S. Army Corps of Engineers on those portions of Caballo Creek and its tributaries that lie within the adjacent Caballo Mine's existing permit area. A large portion of the Caballo West LBA tract is within Caballo Mine's permit area; therefore, a wetland inventory on Tisdale Creek that lies within the BLM study area for the LBA tract has been conducted and is included in the mine's approved mine permit.

Figure S3-6 in the Supplementary Information document depicts the wetlands analysis area for the Caballo West LBA tract, which includes the BLM study area for the LBA tract plus a ¼-mile disturbance buffer around the study area sufficient to mine and reclaim the tract as a part of the Caballo Mine operation. Caballo Mine conducted a preliminary wetlands inventory in 2007, based on USFWS NWI mapping and vegetation mapping in the field, on the portions of

the wetlands analysis area that are outside of the current Caballo Mine permit area. A formal wetland delineation survey would be conducted and submitted to the COE for verification as part of the mining and reclamation permit process, if the tract is leased and proposed for mining.

Based on preliminary wetlands mapping completed in 2007 and earlier wetland delineation confirmed by the COE, a total of approximately 15.0 acres of Waters of the U.S., including a total of 8.63 acres of jurisdictional Waters of the U.S., occur within the entire wetlands analysis area. Approximately 6.51 of those acres are jurisdictional wetlands that occur along the water courses of Tisdale Creek. The 2.12 acres of jurisdictional other Waters of the U.S. that did not qualify as wetlands consist primarily of open water that is held within the in-channel impoundments along Tisdale Creek. The internally drained playa located near the center of Section 7, T.48N., R.71W., adjacent to the LBA tract as applied for and within the wetlands analysis area, was delineated in 1996 as a jurisdictional wetland, but was later declared non-jurisdictional by the COE following a decision of the U.S. Supreme Court in *Solid Waste Agency of Northern Cook County v U.S. Army Corps of Engineers* (No. 99-1178, January 9, 2001). Approximately 6.37 acres of non-jurisdictional wetlands are included in this playa.

Within the proposed lease area and adjacent study area there is no “critical” habitat designated by USFWS for T&E species. The following discussion describes species’ habitat requirements and their occurrence in the area of the Caballo West LBA tract and evaluates the potential environmental effects of the Proposed Action and Alternative 2 on federal T&E species.

E3-2.1 Threatened Species

E3-2.1.1 Ute ladies’-tresses

Ute ladies’-tresses, a member of the orchid family, was listed as threatened on January 17, 1992, due to a variety of factors, including habitat loss and modification, hydrological modifications of existing and potential habitat areas, and invasion of exotic plant species. At the time of listing, Ute ladies’-tresses was only known from Colorado, Utah, and extreme eastern Nevada. Ute ladies’-tresses orchids were discovered in Wyoming in 1993. It is currently known from western Nebraska, eastern Wyoming, north-central Colorado, northeastern and southern Utah, east-central and southeastern Idaho, southwestern Montana, and central Washington.

Biology and Habitat Requirements: Ute ladies’-tresses is a perennial, terrestrial orchid with erect, glandular-pubescent stems 12 to 50 cm tall arising from tuberous-thickened roots. Ute ladies’-tresses occurs primarily on moist, subirrigated or seasonally flooded soils bordering wetland meadows, springs, lakes, or perennial streams. The elevation range of known occurrences is 4,200 to 7,000 feet in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows. Most populations are found on alluvial

sand, coarse silt, or whitish loamy clay with a slightly basic pH. These soils are derived from Quaternary alluvial deposits or drab Eocene- age sandstones and claystones (Fertig 2000). Ute ladies'-tresses is not found in heavy, tight clay soils, saline, or alkaline soils.

This orchid can be commonly associated with horsetail, milkweed, verbena, blue-eyed grass, reedgrass, goldenrod, bentgrass, and arrowgrass (USFWS 2005). Wyoming populations often occur in moist meadow communities dominated by redtop, common quackgrass, Baltic rush, foxtail barley, or switchgrass within a narrow vegetative band between emergent aquatic vegetation and dry upland prairie (Fertig 2000). Vegetative cover tends to range from 75-90 percent and is usually less than 45 cm tall (Fertig 2000). The orchid seems intolerant of shade. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system.

In Wyoming, this species typically blooms from early August to early September, with fruits produced from mid-August to September (Fertig 2000). Leaves persist during flowering (Moseley 1998). Flowers are white or ivory and are clustered into a spike at the top of the stem. No direct observations of pollination have been made in Wyoming. In their 1994 report, Sipes and Tepedino indicated that large, long-tongued bumblebees in the genus *Bombus* are the primary pollinators in Utah and Colorado (Fertig 2000). Smaller bees may also visit these flowers, but have the incorrect body shape or mass to properly accommodate the orchid's large, sticky anther/pollen clusters (Fertig 2000).

This species reproduces basically by sexual reproduction and can produce as many as 7,300 tiny seeds per fruit (Fertig 2000). The plant requires mycorrhizal fungi to germinate and establish. Individual plants may not flower in consecutive years under adverse environmental conditions but will persist below ground with their mycorrhizal symbionts (Fertig 2000).

Flowers are needed for positive plant identification. The species can be reliably located only when it is flowering (Heidel 2001). Plants probably do not flower every year and may remain dormant below ground during drought years. In general, the species' best flowering years seem to correspond with extreme heat during flowering. Preliminary review of climate data also indicates that growing seasons that start out as relatively cold and wet correspond with low flowering levels (Heidel 2001).

The orchid is well adapted to disturbances from stream movement and is tolerant of other disturbances such as grazing that are common to grassland riparian habitats (USFWS 1995). Populations are often dynamic and "move" within a watershed as disturbances create new habitat or succession eliminates old habitat (Fertig and Beauvais 1999). Ute ladies'-tresses colonize early successional riparian habitats such as point bars, sand bars, and low-lying gravelly, sandy, or cobbly edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing

season. The orchid has been known to establish in heavily disturbed sites, such as revegetated gravel pits, heavily grazed riparian edges, and along well-traveled foot trails on old berms (USFWS 1995).

Existing Environment: Prior to 2005, four orchid populations had been documented within Wyoming, all discovered between 1993 and 1997 (Fertig and Beauvais 1999). Four additional sites were located in 2005 and one additional site was found in 2006 (Heidel, 2007). The new locations were in the same drainages or tributaries as the original four populations. Drainages with documented orchid populations include Antelope Creek and tributaries in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County. No occurrences have been recorded in Campbell County including the Caballo West vegetation general analysis.

Areas of suitable habitat within the Caballo West LBA tract and adjacent study area were surveyed by BKS Environmental Associates, Inc. in the latter half of August 2007. Topographical and wetland delineation maps for the study area were reviewed to identify all drainages that may contain the orchid. Suitable habitat factors included less steep stream banks, light soil texture and well drained soils, close lateral or vertical distance to perennial water source during the flowering period, lack of plant competition, lack of general soil alkalinity/salinity, and current or historical management practices that did not promote overgrazing and extensive use of riparian areas. Suitable habitat was traversed on foot during the time of actual flowering of the known population, and it involved walking entire lengths of the drainages documenting locations of potential habitat and searching for this species.

No individuals of the Ute ladies'-tresses orchid were located during the 2007 survey. Most of the habitat suitable for Ute ladies'-tresses orchid within the Caballo West LBA tract and adjacent study area is found within the Lowland Grassland vegetation type. This area covers 21.6 acres of the Caballo West LBA tract. The ephemeral drainage containing Lowland Grassland generally flows from south to north through the northern portion of the Caballo West LBA tract. In response to surface discharge of groundwater associated with CBNG development within the drainage, which is a relatively recent phenomenon, streamflow occurrence is now more persistent and the drainage channel is seldom completely dry. A total of 8.63 acres of jurisdictional Waters of the U.S., occur within the entire wetlands analysis area.

Effects of the Proposed Project: **Mining the federal coal included in the Caballo West LBA tract, if the tract is leased under the Proposed Action or Alternative 2, may affect, but is not likely to adversely affect Ute ladies'-tresses.** Marginal habitat for this species is present within the Lowland Grassland vegetation type only. Surveys of the existing suitable habitat at the Caballo Mine and other mines in this area have not found any Ute ladies'-tresses. Because of the ability of this species to persist below ground or above ground without flowering, single season surveys that meet the current USFWS

survey guidelines may not detect populations. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for Ute ladies'-tresses within the project area should be identified and surveyed prior to surface mining activities.

Jurisdictional wetlands located in the Caballo West LBA tract that are destroyed by mining operations would be replaced in accordance with the requirements of Section 404 of the Clean Water Act, as determined by the U.S. Army Corps of Engineers (COE). The replaced wetlands may not duplicate the exact function and landscape features of the pre-mine wetlands. COE considers the type and function of each jurisdictional wetland that will be impacted and may require restoration of additional acres if the type and function of the restored wetlands will not completely replace the type and function of the original wetland. Replacement of non-jurisdictional and functional wetlands may be required by the surface landowner and/or WDEQ/LQD. WDEQ/LQD allows and sometimes requires mitigation of non-jurisdictional wetlands affected by mining, depending on the values associated with the wetland features. WDEQ/LQD also requires replacement of playas with hydrologic significance.

Cumulative Effects: Alterations of stream morphology and hydrology are believed to have extirpated Ute ladies'-tresses from most of its historical range (USFWS 2002). Disturbance and reclamation of streams by surface coal mining may alter stream morphology and hydrology. The large quantities of water produced with CBNG development and discharged on the surface may also alter stream morphology and hydrology.

E3-2.2 Endangered Species

E3-2.2.1 Black-footed ferret

The black-footed ferret, a nocturnal mammal and an obligate associate of prairie dogs (*Cynomys* spp.), was listed as endangered in March, 1967. This species is thought to have historically inhabited a nearly contiguous matrix of prairie dog colonies spanning the short-grass prairies of the eastern and southern Rockies and the Great Plains of North America (Forrest et al. 1985). Since the early 1930s, numerous factors have led to substantial declines in prairie dog colonies in that region. Reductions in some states are estimated as high as 90% from formerly occupied colonies (Rose 1973, Tyler 1968).

Conversion of grasslands to agricultural landscapes, eradication of prairie dogs, and diseases such as the plague and canine distemper have resulted in severe reductions in prairie dog colonies across the west, colonies which provided food, shelter, and habitat for black-footed ferrets. This species of ferret is currently one of the most endangered mammals in North America and was thought to be extinct until a small population was discovered in Meeteetse, Wyoming in September, 1981. Since then, successful captive breeding and

reintroduction programs have released black-footed ferrets back into the wild in several western and Great Plains states including Wyoming, Montana, South Dakota, Colorado, Utah, and Arizona.

Biology and Habitat Requirements: Ferrets rely on prairie dogs to provide both shelter and food (Hillman and Clark 1980). Ferrets produce one litter per year, typically giving birth to four or five kits. The decline in ferret populations has been largely attributed to the reduction in the vast prairie dog colonies that historically existed in the western United States. Despite extensive ferret surveys over the past 20 plus years throughout Wyoming, the last known wild black-footed ferret population was discovered near Meeteetse in 1981 (Miller et al. 1996). Those surveys included numerous USFWS-approved clearances for coal mining and other development in the Powder River Basin of Wyoming, as well as the USFS surveys for ferrets on the TBNG. Reintroduction efforts involving captive bred individuals have successfully established one black-footed ferret population in the Shirley Basin area in south-central Wyoming. Currently, this is the only known black-footed ferret population within the state, though other populations are present elsewhere in the United States and Mexico.

Existing Environment: The Caballo West LBA tract is within the historical range of the black-footed ferret, although no black-footed ferrets are presently known to occur in northeastern Wyoming. During the 1980s, WGFD, in cooperation with other agencies, conducted searches for black-footed ferrets in Wyoming in the places they were most likely to be found, but these searches were not successful (Martin Grenier, personal communication, 10/14/2003). In a February 2, 2004 letter to interested parties, the USFWS declared that black-footed ferret surveys are no longer necessary in black-tailed prairie dog colonies within Wyoming.

TJS has mapped the current acreage of prairie dog colonies in the vicinity of the Caballo Mine by walking the perimeters of colonies and delineating them on topographic maps. No black-tailed prairie dog colonies are currently present within the Caballo West wildlife general analysis area. No evidence of ferrets has been recorded during general or specific ferret surveys over conducted by wildlife consultants for the Caballo Mine and other mines in this area.

Effects of the Proposed Project: **Mining the federal coal included in the Caballo West LBA tract, if a lease is issued under the Proposed Action or Alternative 2, would have no effect on black-footed ferrets.** Given the documented absence of black-footed ferrets in the region, including the general analysis area during specific surveys for this species, the block clearance issued by USFWS for black-tailed prairie dog colonies throughout the entire state, and the distance of the LBA area from future reintroduction sites, mining the generally analysis area will not result in any direct or indirect effects on black-footed ferrets (USFWS 2004).

Mine activities include, but are not limited to, large-scale topsoil stripping, the intense presence of heavy machinery, extended human presence, loud noise and various linear disturbances such as roads, power lines and fences. Additionally, ongoing disturbance (grazing, oil and gas production, etc.) from sources unrelated to mining would likely continue, with some activities occurring within prairie dog colonies in the area. These activities would result in less habitat disturbance than surface mining, but physical disturbance would occur.

Based on more than 20 years of historic and recent survey efforts and other general analysis area data and information, it is unlikely that ferrets exist in the Belle Ayr North wildlife general analysis area.

Cumulative Effects: Mineral development within black-tailed prairie dog colonies is a leading cause of ferret habitat loss in the PRB. Surface coal mining tends to have more intense impacts on fairly localized areas, while oil and gas development tends to be less intensive but spread over larger areas. Oil and gas development and mining activities have requirements for reclamation of disturbed areas as resources are depleted. In reclaimed areas, vegetation cover may differ from undisturbed areas. In the case of surface coal mines, re-established vegetation would be dominated by species mandated in the reclamation seed mixtures (to be approved by WDEQ). The majority of the approved plant species are native to the area; however, reclaimed areas may not serve ecosystem functions presently served by undisturbed vegetation communities and habitats, particularly in the short-term, when species composition, shrub cover, and other environmental factors are likely to be different. Shifts in habitat composition or distribution following reclamation could increase or decrease potential habitat for prairie dogs and associated habitat for black-footed ferrets. However, black-tailed prairie dogs have been recorded invading and establishing towns on reclaimed coal mined lands in northeastern Wyoming (IR 2005).

Potential ferret habitat is also affected by other impacts to prairie dog populations. Plague can infect and eliminate entire prairie dog colonies. Poisoning and recreational prairie dog shooting may locally reduce prairie dog populations, but seldom completely eliminate colonies.

E3-2.2.2 Blowout Penstemon

Blowout Penstemon, a member of the figwort family, was listed as endangered on October 1, 1987. It is known from multiple populations in western Nebraska and in the Ferris dunes area in northwestern Carbon County, Wyoming. The plant was first discovered in Wyoming in 1877 and then rediscovered in 1996 (BLM 2008). The removal of fire, leveling of dunes, reduction of grazing, and cultivation of stabilizing cover crops drastically reduced the amount of habitat available for this species. Loss of habitat, coupled with impacts from insect outbreaks, drought, inbreeding, and potential over collection, has caused problems for the plant (University of Wyoming

2009). Only 3,500-5,000 plants are currently found in Nebraska at about a dozen sites. The Wyoming population is limited to three sites in northern Carbon County that contain several thousand plants (BLM 2008). Threats to the plant may occur when sand dunes are removed or overly disturbed by vehicular traffic (USFWS 2008b).

Biology and Habitat Requirements: Blowout penstemon is a perennial herb with stems less than 12 inches tall. The inflorescence is 2 to 6 inches long and has six to ten compact whorls of milky-blue to pale lavender flowers. This species typically flowers from mid-June to early-July. The plant's current know range in Wyoming is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25 to 40 percent vegetative cover (USFWS 2008b).

Biology and Habitat Requirements: Blowout penstemon is a perennial, perennial herb with stems less than 12 inches tall. The inflorescence is 2 to 6 inches long and has six to ten compact whorls of milky-blue to pale lavender flowers. This species typically flowers from mid-June to early-July. The plant's current know range in Wyoming is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25 to 40 percent vegetative cover (USFWS 2008b).

Existing Environment: The Caballo West LBA tract is not within the documented historical range of the blowout penstemon. It is located approximately 150 miles northwest of the Nebraska known occurrences and approximately 150 miles northeast of the Wyoming occurrences. No suitable sand dunes (whether stable or blownout) are currently present on the Caballo West vegetation general analysis area.

Effects of the Proposed Project: **Mining the federal coal included in the Belle Ayr North LBA tract, if a lease is issued under the Proposed Action or Alternative 2, would have no effect on blowout penstemon.** Typical suitable habitat for this species on the tract is non-existent. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for blowout penstemon within the project area should be identified and surveyed prior to surface mining activities.

Cumulative Effects: This species is potentially vulnerable to habitat loss and degradation resulting from sand mining, water development, energy development, ORV use, and associated destabilization of its sand dune habitat. It also could be vulnerable to negative effects related to the spread of non-native species within its range.

E3-3.0 SUMMARY OF DETERMINATIONS

Table E3-1 summarizes the determinations for federally listed T&E species in the area of the Caballo West LBA tract that may result from implementing the Proposed Action or Alternative.

Table E3-1. Effects Evaluation of Sensitive and Federal T&E Species in the Area of the Caballo West LBA Tracts.

Status	Species Common Name	Potential Effects
Threatened:	Ute ladies'-tresses	May affect ¹
Endangered:	Black-footed ferret	No effect
Endangered:	Blowout Penstemon	No effect

¹ Not likely to adversely affect individuals or populations.

E3-4.0 CREDENTIALS OF SURVEY PERSONNEL

E3-4.1 Jones & Stokes of Gillette, Wyoming

Gwyn McKee

Ms. McKee obtained a Master of Science degree in Wildlife Ecology/Management from the University of Missouri-Columbia. She has accumulated nearly 20 years of professional experience, with the last 14 spent working with the energy industry in Wyoming, Montana, and South Dakota. Ms. McKee has conducted the wildlife surveys and impact analyses for most of the surface coal mines in the Powder River Basin during her tenure in Wyoming, including two of the three properties analyzed in the South Gillette Area Coal EIS. She has also provided and/or reviewed the pertinent text related to impact assessments for vertebrate species of concern for most of the coal EISs that have been prepared in the Powder River Basin since 2000.

Jennifer Ottinger

Ms. Ottinger received a B.S. in Zoology from Colorado State University in 1993, with a minor in Microbiology. She has 12 years of professional experience with a variety of vertebrate species, including surveys for sage-grouse and mountain plovers, though her work has focused on raptors during that period. Ms. Ottinger has worked throughout the U.S. and abroad. She joined Jones & Stokes as a Wildlife Biologist in 2004. She has strong raptor identification and handling skills, research experience, proven abilities in data analysis and technical writing, and has presented and/or published several articles in a variety of professional meetings and publications, respectively.

E3-4.2 BKS Environmental Associates, Inc of Gillette, Wyoming

Dr. Brenda K. Schladweiler

Dr. Brenda K. Schladweiler obtained her Ph.D. in Soil Science from the University of Wyoming, 2003. M.S. in Soil Science from University of Wyoming 1995, and B.S. Range Management (Land Rehabilitation) from Colorado State University, Fort Collins, Colorado 1980.

Dr. Schladweiler has extensive experience over the last 26 years in conducting rare plant surveys. The following is a list of recent threatened and endangered plant studies she has conducted:

Location	Date	Plants Surveyed
Wharf Mine, Lawrence Co., SD	1992	Various, State of SD Heritage Plants
Ferris Haggerty Mine, Carbon Co., WY	1998	Various, State of WY
Crow AML, Big Horn Co., MT	1999	Various, State of MT
Caballo Mine	1999	<i>Spiranthes diluvialis</i>
Wright Clinic AML, Campbell Co., WY	1999	<i>Spiranthes diluvialis</i>
Kane Environmental, Campbell Co., WY	1999	<i>Spiranthes diluvialis</i>
Atlantic City Mine, Knight Piesold, Fremont Co., WY	2000	<i>Spiranthes diluvialis</i>
Eagle Butte Mine, Campbell Co., WY		<i>Spiranthes diluvialis</i>
West Antelope Mine, Converse Co., WY	2001	<i>Spiranthes diluvialis</i>
BRS, Bighorn Basin Water Project, Washakie Co., WY	2001	Various, State of Wyoming Plant
URS, Transmission Line, Campbell Co., WY	2001	<i>Spiranthes diluvialis</i>
Wright, (bike path) Campbell Co., WY	2001	<i>Spiranthes diluvialis</i>
Gillette, PCA sewer line, Campbell Co., WY	2002-2004	<i>Spiranthes diluvialis</i>
Gillette, PCA trunk line, Campbell Co., WY	2002-2004	<i>Spiranthes diluvialis</i>
Pinehaven (Wester-Wetstein), Crook Co., WY	2003	<i>Spiranthes diluvialis</i>
Spotted Horse, (CBMA CH4), Campbell Co., WY	2003	<i>Spiranthes diluvialis</i>
Bowers Oil (Antelope Creek)Campbell/Converse Co., WY	2003	<i>Spiranthes diluvialis</i>
Gillette, PCA Swanson Rd., Campbell Co., WY	2003	<i>Spiranthes diluvialis</i>
North Rochelle Mine USFS Survey, Campbell Co., WY	2004	Various USFS Sensitive Species for TBNG
Westport Oil & Gas, Nicholson POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy, Mustang POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
NARM, Beckwith Rd., Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Yates Petroleum, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i> ; various USFS Sensitive Species for TBNG
PRCC, Ridgeroad USFS, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>

Lance, Black Thunder POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy, Mulie POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy Whitetail POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>
Devon Energy, Bighorn POD, Campbell Co., WY	2004	<i>Spiranthes diluvialis</i>

Numerous actions have been taken by Dr. Schladweiler to become acquainted with the known locations and the appearance of *Spiranthes diluvialis*. Research has been conducted through the Wyoming Natural Diversity Database and the Internet for sensitive plants. In addition, she has actually visited the population on the Unnamed Tributary to Antelope Creek numerous times over the last approximate 10 years. This known population verification was completed as part of a field survey conducted for Yates Petroleum Company in the Rochelle Hills POD, Campbell County, Wyoming on August 29, 2004. She has also visited the known population near Chugwater, Wyoming.

Dr. Schladweiler on numerous occasions has been in contact with Mr. Ernie Nelson, University of Wyoming, Rocky Mountain Herbarium, and George Jones, Wyoming Natural Diversity Database. In addition, she has consulted with Mr. Walt Fertig, previously from the University of Wyoming.

Katie Halvorson

Katie Halvorson holds a B.S. in Environmental Studies with a minor in Biology from Bemidji State University, Bemidji, Minnesota (2005). Ms. Halvorson has been employed by BKS Environmental since the spring of 2005. She has been conducting mineland reclamation monitoring for various coal mines in Campbell and Converse County, Wyoming since her employment. She has also performed vegetation sampling for numerous CBM projects and baseline vegetation surveys in the Powder River Basin. In addition, she has conducted rare plant species surveys, wetland delineations, and environmental compliance assessments. Threatened, endangered, proposed and sensitive plant survey experience includes:

- Visited a tributary of Antelope Creek and observed a *Spiranthes diluvialis* (Ute Ladies' Tresses orchid) population. 2005.
- Powder River Coal LLC – North Antelope Rochelle Mine Umbrella Botany Evaluation, in Campbell County, Wyoming. 2005.
- Powder River Coal LLC – Gold Mine Draw AVF Exchange – Ute Ladies' Tresses orchid survey, in Campbell County, Wyoming. 2005.
- West Roundup Resources, Inc. – School Creek Mine – Ute Ladies' Tresses orchid survey in Campbell County, Wyoming. 2005 and 2006.
- Devon Energy Corporation – Juniper Draw Unit – Ute Ladies' Tresses orchid survey in Johnson County, Wyoming. 2005.
- Devon Energy Corporation – Crossroads Unit – Ute Ladies' Tresses orchid survey in Johnson County, Wyoming. 2005.
- Marathon Oil Company – Knudson 9 Unit – Ute Ladies' Tresses orchid survey in Campbell County, Wyoming. 2006.

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- Marathon Oil Company – Twenty Mile Butte Unit – Ute Ladies’ Tresses orchid survey in Campbell County, Wyoming. 2006.
- Marathon Oil Company – West Innes 27 Unit – Ute Ladies’ Tresses orchid survey in Campbell County, Wyoming. 2006.
- Rio Tinto Energy America – Antelope Mine – Ute Ladies’ Tresses orchid habitat survey in Converse County, Wyoming. 2007.

Cindy Robinson

Cindy Robinson holds a Masters of Business Administration (MBA) and a B.S. in Environmental Science from the University of Denver, Denver, Colorado (2005). Ms. Robinson has been employed by BKS Environmental since April of 2006. She has been conducting mineland reclamation monitoring for various coal mines in Campbell County, Wyoming during the last year. In addition, she has conducted rare plant species surveys, wetland delineations, and environmental compliance assessments. Ms. Robinson has also visited an *Astragalus barrii* site, on USFS lands at the proposed School Creek Mine area when the species was blooming. Threatened and endangered and sensitive plant survey experience includes:

- West Roundup Resources, Inc., – School Creek Mine – Barr's Milkvetch survey in Campbell County, Wyoming. 2006.
- West Roundup Resources, Inc., – School Creek Mine – Ute Ladies’ Tresses orchid survey in Campbell County, Wyoming. 2006.
- Thunder Basin Coal Company, Black Thunder Mine – West Hilight – Barr's Milkvetch survey. August 2006.
- Wellstar Corporation (Jones and Stokes), Ute Ladies Tresses orchid survey. 2007.

Jamie Eberly

Jamie Eberly holds a B.S. in Range Management, Rangeland Livestock Option with a Business Administrations minor from Chadron State College, Chadron, Nebraska (2005). Ms. Eberly has been employed by BKS Environmental since the fall of 2006. She has been conducting mineland reclamation monitoring for various coal mines in Campbell and Converse County, Wyoming since her employment. She has also performed vegetation sampling for numerous CBM projects and baseline vegetation surveys in the Powder River Basin. In addition, she has conducted rare plant species surveys, wetland delineations, and environmental compliance assessments. Threatened, endangered, proposed and sensitive plant survey experience includes:

- Williams Production Company, West Cripple Creek POD, Biological Evaluation/Biological Assessment in Campbell County, Wyoming. 2007.

SECTION 4

MAYSDORF II LBA TRACT

E4-1.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

E4-1.1 The Proposed Action

On September 1, 2006, Cordero Mining Company filed an application with the BLM to lease federal coal reserves in a tract located west of and immediately adjacent to the Cordero Rojo Mine (figure E-1). The tract was assigned case file number WYW173360. Under the Proposed Action for the Maysdorf II LBA tract, the tract as applied for by CMC would be offered for lease at a sealed-bid, competitive lease sale. The boundaries of the tract would be consistent with the tract configuration proposed in the Maysdorf II LBA tract lease application (figure E4-1). The Proposed Action assumes that CMC will be the successful bidder on the Maysdorf II LBA tract if it is offered for sale.

The legal description of the proposed Maysdorf II LBA tract coal lease lands as applied for by CMC under the Proposed Action is as follows:

T. 46 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 4: Lots 8, 9, 16, 17;	163.79 acres
Section 5: Lots 5, 12, 13, 20;	165.03 acres
Section 9: Lots 6 through 8;	122.86 acres
Section 10: Lots 7 through 10;	162.62 acres
Section 11: Lots 13 through 16;	161.87 acres
Section 14: Lots 1 through 4;	161.69 acres
Section 15: Lots 1 through 4;	162.59 acres

T. 47 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 7: Lots 6 through 11, 14 through 19;	490.18 acres
Section 17: Lots 1 through 15, and W½;	639.73 acres
Section 18: Lots 5 through 14, 19, 20;	481.50 acres
Section 20: Lots 1, 8, 9, 16;	154.31 acres
Section 21: Lots 4, 5, 12, 13;	157.69 acres
Section 28: Lots 4, 5, 12, 13;	165.80 acres

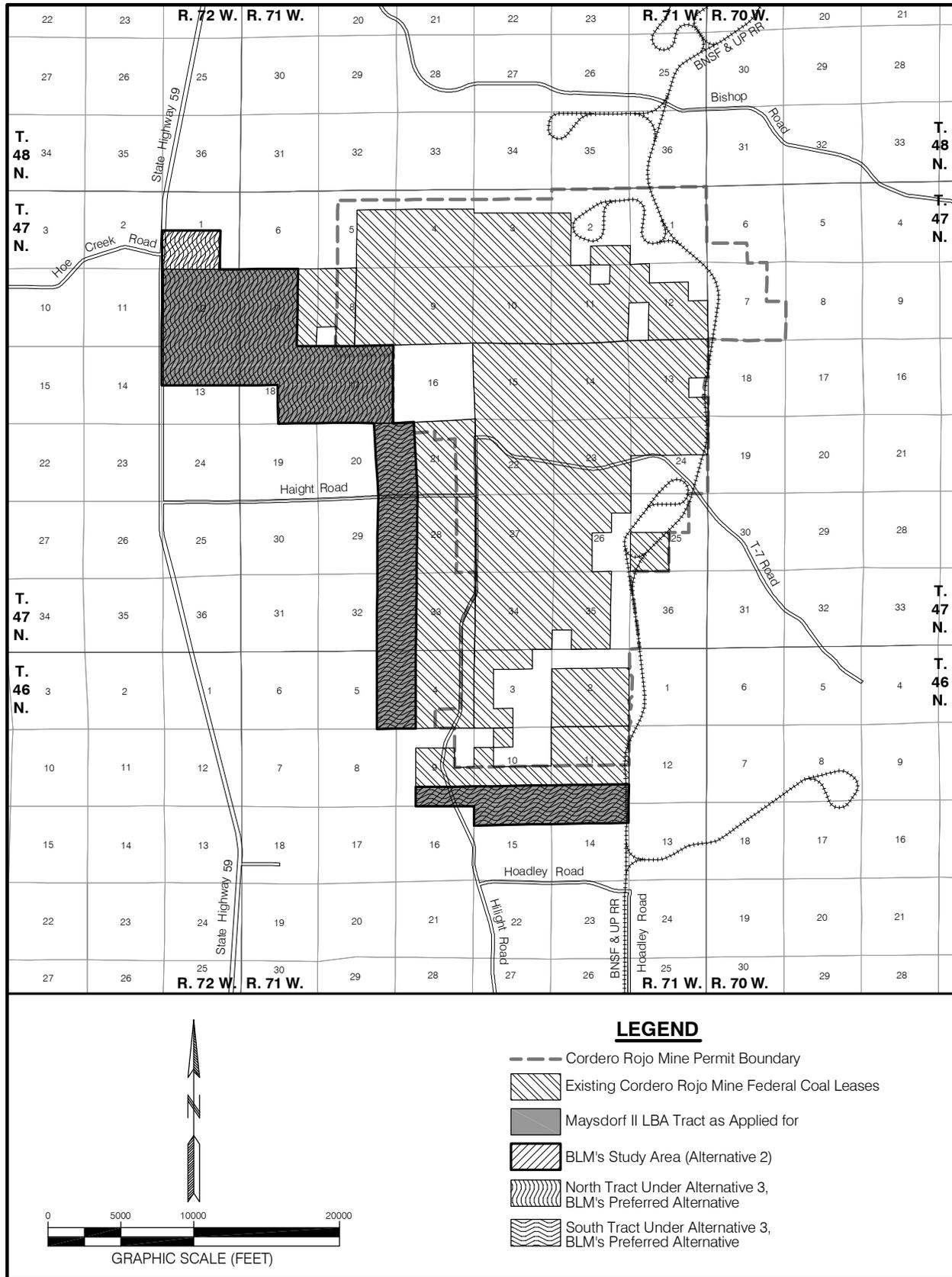


Figure E4-1. Maysdorf II LBA Tract Alternatives.

Section 29: Lots 1, 8, 9, 16;	164.45 acres
Section 32: Lots 1, 8, 9, 16;	162.94 acres
Section 33: Lots 4, 5, 12, 13;	164.64 acres
<u>T. 47 N., R. 72 W., 6th PM, Campbell County, Wyoming</u>	
Section 12: Lots 1 through 16;	647.10 acres
Section 13: Lots 1 through 8.	<u>325.04 acres</u>
Total:	4,653.83 acres

The coal estate underlying this tract described above is owned by the federal government and administered by the BLM. The surface estate of the tract is privately and federally owned. The federal surface estate is administered by BLM. Surface ownership is shown in figure E4-2.

The tract as applied for includes approximately 4,653.8 mineable acres. It is assumed that an area larger than the tract would have to be disturbed in order to recover all of the coal in the tract. The disturbances outside of the tract would be due to activities like overstripping, matching undisturbed topography, and construction of flood control and sediment control structures.

CCC estimates that the tract as proposed includes approximately 98.2 million tons of in-place coal and 87.5 million tons of mineable coal. Using CCC's projected recovery factor of 93.5 percent, the tract would contain about 81.8 million tons of recoverable coal.

The Maysdorf II LBA tract as applied for contains approximately 504.0 million tons of in-place coal reserves. Excluding the federal coal reserves within the railroad right-of-way, the highway and county road rights-of-way and buffer zones, and taking into account the no-coal zone, CMC estimates that the Maysdorf II LBA tract as applied for contains approximately 482.7 million tons of mineable coal reserves. Using CMC's projected recovery factor of 90 percent of the mineable coal reserves included in BLM's tract reconfiguration, the tract would contain about 434.5 million tons of recoverable coal. At the average annual coal production rate of 46.3 mmtpy, mining this coal would extend mine life by over 9 years.

E4-1.2 Alternatives to the Proposed Action

E4-1.2.1 Alternative 1

Under Alternative 1, the No Action Alternative, the application to lease the coal included in the Maysdorf II LBA tract would be rejected, the tract would not be offered for competitive sale, and the coal included in the tract would not be

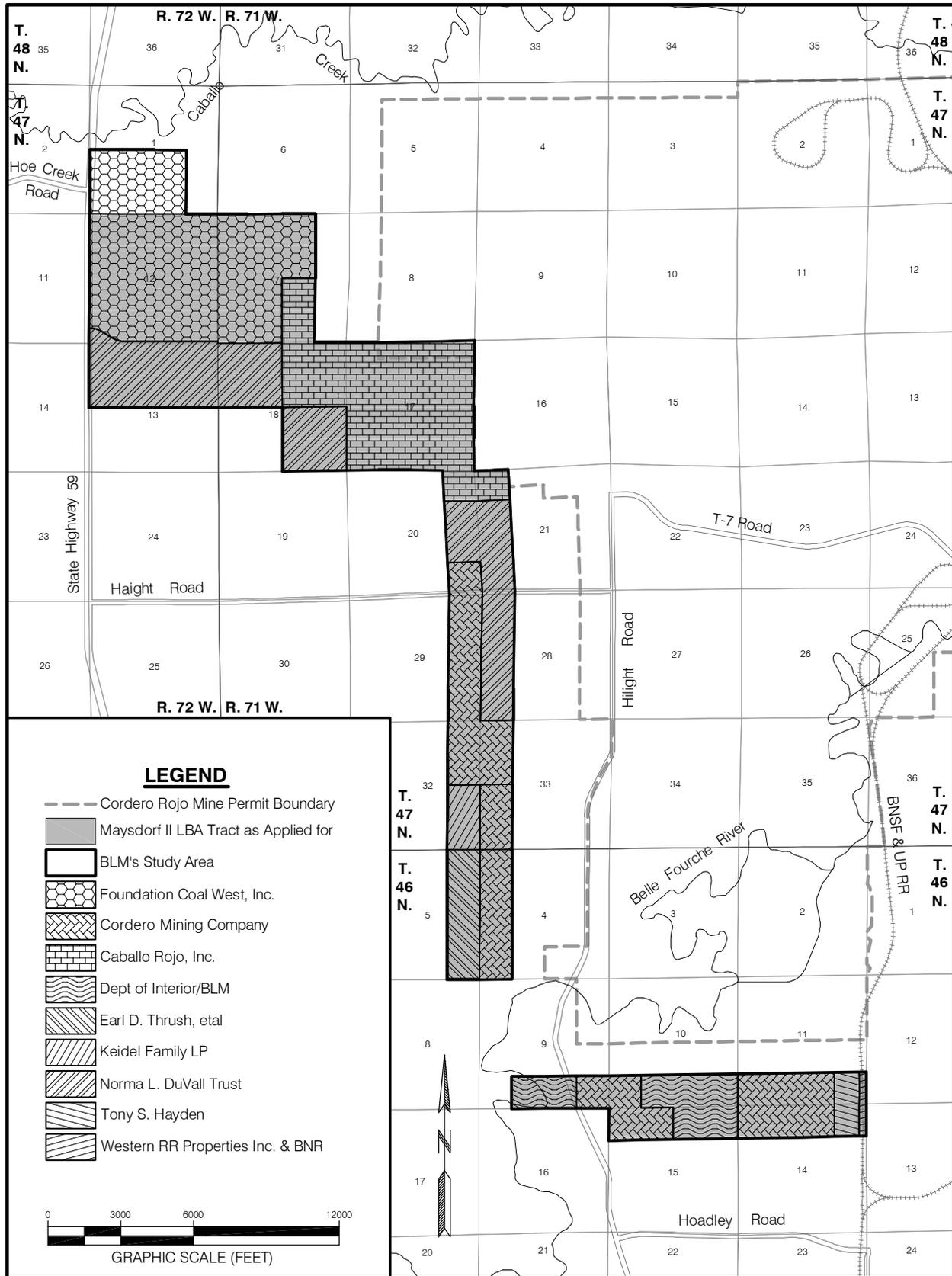


Figure E4-2. Surface Ownership Within the Maysdorf II LBA Tract Alternatives.

mined. This would not affect permitted mining activities and employment on the existing leases at Cordero Rojo Mine and would not preclude an application to lease the federal coal included in the Maysdorf II LBA tract in the future. No additional surface of the Maysdorf II LBA tract would be disturbed due to overstripping to allow coal to be removed from the adjacent existing leases.

E4-1.2.2 Alternative 2

Under Alternative 2 for the Maysdorf II LBA tract, BLM would reconfigure the tract, hold a competitive coal sale for the lands included in the reconfigured tract, and issue a lease to the successful bidder. In evaluating the Maysdorf II coal lease application, BLM identified a study area, which includes unleased federal coal adjacent to the northern edge of the tract as applied for (figure E4-1). BLM is evaluating the potential that some or all of these lands could be added to the tract to provide for more efficient recovery of the federal coal, increase competitive interest in the tract, and/or reduce the potential that some of the potentially mineable federal coal in this area would be bypassed in the future if it is not included in the Maysdorf II LBA tract. The modified tract would be subject to standard and special lease stipulations developed for the PRB and this tract if it is offered for sale, as discussed above.

Alternative 2 for the Maysdorf II LBA tract assumes that CMC would be the successful bidder on the tract if a lease sale is held and that the tract would be developed as a maintenance lease to extend the life of the adjacent Cordero Rojo Mine. Other assumptions are the same as for the Proposed Action. The lands that BLM is considering adding to the tract are:

T.47N., R.72W., 6th P.M., Campbell County, Wyoming

Section 1: Lots 9 through 13, and NW $\frac{1}{4}$ SE $\frac{1}{4}$; 241.80 acres

The legal description of BLM's reconfiguration of the Maysdorf II LBA tract under Alternative 2 is as follows:

T. 46 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 4: Lots 8, 9, 16, 17; 163.79 acres

Section 5: Lots 5, 12, 13, 20; 165.03 acres

Section 9: Lots 6 through 8; 122.86 acres

Section 10: Lots 7 through 10; 162.62 acres

Section 11: Lots 13 through 16; 161.87 acres

Section 14: Lots 1 through 4; 161.69 acres

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Section 15: Lots 1 through 4; 162.59 acres

T. 47 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 7: Lots 6 through 11, 14 through 19; 490.18 acres

Section 17: Lots 1 through 15, and W $\frac{1}{2}$; 639.73 acres

Section 18: Lots 5 through 14, 19, 20; 481.50 acres

Section 20: Lots 1, 8, 9, 16; 154.31 acres

Section 21: Lots 4, 5, 12, 13; 157.69 acres

Section 28: Lots 4, 5, 12, 13; 165.80 acres

Section 29: Lots 1, 8, 9, 16; 164.45 acres

Section 32: Lots 1, 8, 9, 16; 162.94 acres

Section 33: Lots 4, 5, 12, 13; 164.64 acres

T. 47 N., R. 72 W., 6th PM, Campbell County, Wyoming

Section 1: Lots 9 through 13, and NW $\frac{1}{4}$ SE $\frac{1}{4}$; 241.80 acres

Section 12: Lots 1 through 16; 647.10 acres

Section 13: Lots 1 through 8. 325.04 acres

Total: 4,895.63 acres

A portion Wyoming State Highway 59 and portions of the Haight Road (County Road 44) and the Hilight Road (County Road 52) overlie some of the coal included in the tract. As discussed in Chapter 1, Section 1.1, the Surface Mining Control and Reclamation Act prohibits mining within 100 ft on either side of the right-of-way of any public road (43 CFR 3461). The coal underlying the portions of Highway 59, the Haight and Hilight Roads, and their rights-of-way, and the 100 ft buffer zones within the Maysdorf II LBA tract could be mined if WYDOT and the Campbell County Board of Commissioners, the authorized agencies, determine that the road can be moved [30 CFR 761.11(d)]. CMC does not have plans to relocate the highway at this time but CMC is evaluating the feasibility of relocating the county roads. CMC estimates that approximately 3.0 million tons of mineable coal are included within the right-of-way of Highway 59 and associated 100 ft buffer zone that is within the LBA tract. CMC estimates that approximately 17 million tons of mineable coal are included within the rights-of-way of the Haight and Hilight Roads and associated 100 ft buffer zones that are within the LBA tract.

CMC estimates that the reconfigured tract includes approximately 533.2 million tons of in-place coal. After eliminating coal that lies within the railroad ROW, the public road rights-of-way and buffer zones, CMC estimates that the reconfigured tract includes approximately 510.5 million tons of mineable coal. Using CMC's projected recovery factor of 90 percent, the reconfigured tract would contain about 459.5 million tons of recoverable coal.

E4-1.2.3 Alternative 3

Under Alternative 3 for the Maysdorf II LBA tract, BLM is considering dividing the tract and offering two tracts for sale at separate, competitive sealed bid sales (figure E4-1). The two tracts would each be subject to standard and special lease stipulations developed for the PRB and for each tract if they are offered for sale, as discussed above. Alternative 3, offering two tracts for sale, is BLM's Preferred Alternative.

Alternative 3 for the Maysdorf II LBA tract assumes that CMC would be the successful bidder on the two tracts if lease sales are held and that the tracts would be mined as maintenance leases for the Cordero Rojo Mine. Other assumptions would be the same as for the Maysdorf II LBA tract Proposed Action.

As shown in figure E4-1, the Maysdorf II LBA tract is comprised of two non-contiguous blocks of federal coal. Under Alternative 3, the North Maysdorf II LBA tract would consist of the northernmost block of coal and the South Maysdorf II LBA tract would consist of the two southern blocks of coal, as shown in figure E4-1. BLM is considering dividing the tract because the north tract would potentially be of competitive interest to more than one mine.

As discussed under Alternative 2, BLM has identified a study area, described above and shown in figure E4-1. Under Alternative 3, the BLM could add all, part, or none of the study area to the Maysdorf II LBA tract as applied for.

The lands that BLM is considering including in the north tract are:

T. 47 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 7: Lots 6 through 11, 14 through 19;	490.18 acres
Section 17: Lots 1 through 15, and W½;	639.73 acres
Section 18: Lots 5 through 14, 19, 20;	481.50 acres

T. 47 N., R. 72 W., 6th PM, Campbell County, Wyoming

Section 1: Lots 9 through 13, and NW¼SE¼;	241.80 acres
Section 12: Lots 1 through 16;	647.10 acres

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Section 13: Lots 1 through 8; 325.04 acres

Total: 2,825.35 acres

The lands that would be included in the south tract under BLM's Alternative 3 are:

T. 47 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 20: Lots 1, 8, 9, 16; 154.31 acres

Section 21: Lots 4, 5, 12, 13; 157.69 acres

Section 28: Lots 4, 5, 12, 13; 165.80 acres

Section 29: Lots 1, 8, 9, 16; 164.45 acres

Section 32: Lots 1, 8, 9, 16; 162.94 acres

Section 33: Lots 4, 5, 12, 13; 164.64 acres

T. 46 N., R. 71 W., 6th PM, Campbell County, Wyoming

Section 4: Lots 8, 9, 16, 17; 163.79 acres

Section 5: Lots 5, 12, 13, 20; 165.03 acres

Section 9: Lots 6 through 8; 122.86 acres

Section 10: Lots 7 through 10; 162.62 acres

Section 11: Lots 13 through 16; 161.87 acres

Section 14: Lots 1 through 4; 161.69 acres

Section 15: Lots 1 through 4. 162.59 acres

Total: 2,070.28 acres

Under Alternative 3 reconfiguration of the Maysdorf II LBA tract, the north tract would include approximately 2,825.4 acres containing approximately 326.4 million tons of in-place coal and the south tract would include approximately 2,070.3 acres containing approximately 206.8 million tons of in-place coal, according to information provided by the applicant. The north tract includes the area that would not be mined within the highway ROW and buffer zone, as discussed above. The south tract includes the areas that would not be mined within the Haight and Hilight County Roads and buffer zones, the BNSF & UP railroad ROW, as discussed under Alternative 2.

E4-2.0 SPECIES HABITAT AND OCCURRENCE AND EFFECTS OF THE PROPOSED PROJECT

The Cordero Rojo Mine began producing coal in 1976. Wildlife monitoring has been conducted annually for the mine since the early 1980's. This wildlife monitoring was designed to meet the WDEQ/LQD, WGFD, and federal requirements for annual monitoring and reporting of wildlife activity on coal mining areas. Detailed procedures and site-specific requirements have been carried out as approved by WGFD and USFWS. The monitoring program was conducted in accordance with Appendix B of WDEQ/LQD Coal Rules and Regulations. Because the areas covered in the wildlife surveys included the mine's permit area and a large perimeter around the permit boundary, the entire Maysdorf II LBA tract has been included in baseline inventories and annual wildlife surveys conducted for the Cordero Rojo Mine since wildlife studies began.

The approved Cordero Rojo Mine Permit 237 Term T8 (CMC 2007) includes monitoring and mitigation measures for the Cordero Rojo Mine that are required by SMCRA and Wyoming State Law. If the Maysdorf II LBA tract is acquired by CMC, these monitoring and mitigation measures would be extended to cover operations on the LBA tract when the Cordero Rojo Mine's mining permit is amended to include the tract. This amended permit would have to be approved before mining operations could take place on the tract. These monitoring and mitigation measures are considered to be part of the Proposed Action and Alternatives 2 and 3 during the leasing process because they are regulatory requirements.

Background information on T&E species in the vicinity of the Maysdorf II LBA tract was drawn from several sources, including: wildlife survey reports submitted by the Cordero Rojo Mine to the WDEQ/LQD from 1974 through 2005, the Final South Powder River Basin Coal EIS (BLM 2003), the Maysdorf Coal FEIS (BLM 2007), a Wyoming Natural Diversity Database search (University of Wyoming 2001), and from WGFD and USFWS records and contacts in 2004 and 2005. In addition, the Maysdorf II LBA tract wildlife study area falls within the wildlife monitoring areas for the nearby Belle Ayr and Coal Creek Mines (figure E-1).

Site-specific data for a substantial portion of the tract as applied for and the study area for Alternatives 2 and 3 were obtained from several sources, including WDEQ/LQD permit applications and annual wildlife reports for the Cordero Rojo Mine and other nearby coal mines. Baseline wildlife studies were conducted by Intermountain Resources (IR) expressly for the Maysdorf II LBA tract in 2006-2007. Figure E4-3 depicts IR's T&E animal species survey areas for the Maysdorf II LBA tract.

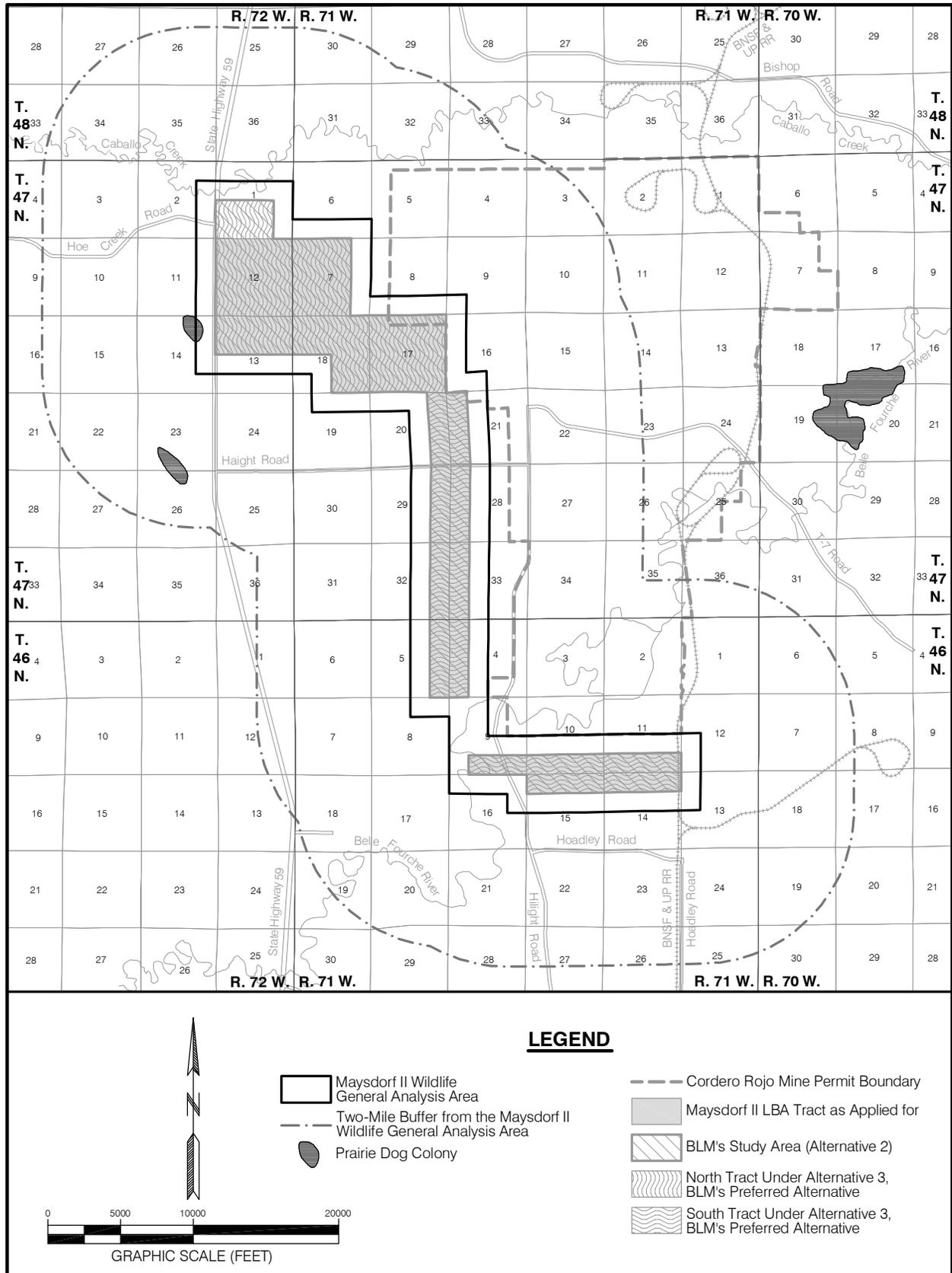


Figure E4-3. T&E Species Survey Area for the Cordero Rojo Mine and the Maysdorf II LBA Tract.

The Maysdorf II LBA tract is in an area of gently rolling terrain of moderate relief influenced by the Belle Fourche River and its tributary, Caballo Creek. Elevation ranges from 4,540 to 4,885 ft within the LBA tract and from 4,520 to 4,885 ft including the area added under Alternatives 2 and 3. Within the LBA tract and the area added under Alternatives 2 and 3, slopes range from flat in the Belle Fourche River floodplain to over 57 percent in the adjacent breaks. The breaks are sharp transitions between the bottomlands and the uplands. The slopes of the gently rolling uplands, which comprise most of the LBA tract, seldom exceed 10 percent. A slope analysis would be done for the LBA tract if a lease sale is held and it is proposed for mining.

Predominant wildlife habitat types classified on the LBA tract and adjacent area correspond with the major plant communities defined during the vegetation baseline study and consist primarily of sagebrush/grassland, grassland, and seeded grassland. Other habitats present in limited extent include disturbance, bottomland, and rough breaks. Networks of road, pipeline, tank battery, and well-pad disturbance areas associated with oil and gas development overlay much of the study area.

The Maysdorf II LBA tract consists predominantly of gently rolling topography, although the southern portion is dissected by the Belle Fourche River bottomlands and breaks. The Belle Fourche River flows roughly east-northeast through the southern portion of the tract and is currently diverted from its natural channel in this area to facilitate mining within the existing Cordero Rojo Mine permit area. The diversion channel was constructed in 1995. All streams in the region show the characteristic extreme low-flow period from October through January. Flow events frequently result from snowmelt during the late winter and early spring. Although peak discharges from such events are generally small, the duration and therefore the percentage of annual runoff volume can be considerable. During the spring, general storms (both rain and snow) increase soil moisture; hence decreasing infiltration capacity, and subsequent rainstorms can result in both large runoff volumes and high peak discharges. Limited segments of the Belle Fourche River do receive recharge from bank storage (groundwater stored in the alluvium along the stream channel) and flow throughout the year, making the stream locally intermittent.

Maysdorf II LBA Tract Wetlands

The wetland analysis area includes the Maysdorf II LBA tract as applied for, the lands added under Alternatives 2 and 3, and a ¼-mile disturbance buffer around the tract sufficient to mine and reclaim the tract as a part of the existing Cordero Rojo Mine operation. Cordero Rojo Mine conducted a preliminary wetlands inventory in 2005 and 2006 of the lands within the wetlands analysis area, based on USFWS NWI mapping and vegetation mapping in the field ESCO (2007). The area investigated is located almost entirely outside of the existing Cordero Rojo Mine permit area, west and south of the current permit boundary. Some wetland areas previously mapped by the USFWS NWI project have been recently altered somewhat due to CBNG-related

water production within and upstream of the Maysdorf II wetlands analysis area. The boundaries of the existing potential wetlands may vary to a greater or lesser extent from the boundaries shown on the NWI maps, and current field conditions may not be representative of the field conditions in the future. Due to the ephemeral nature of CBNG dewatering activities, the wetland boundaries and areas are likewise ephemeral. A formal wetland delineation survey of the area proposed for mining would be conducted and submitted to the COE for verification as part of the mining and reclamation permit process, if the LBA tract is leased.

Based on the existing USFWS NWI mapping data (which may be somewhat outdated) and the vegetation mapping that was conducted in 2005 and 2006, a total of approximately 140.15 acres of wetlands and other Waters of the U.S. occur within the wetlands analysis area. Of this 140.15 acres identified, approximately 133.54 acres are vegetated wetlands and the remaining 6.61 acres are other Waters of the U.S. The majority of the wetlands are associated with the watercourses of the Belle Fourche River and Caballo Creek, diked or impounded reservoirs, and internally drained depressions/playas, while the majority of the other Waters of the U.S. are associated with ephemeral stream channels and areas of open water. These areas that occur within and adjacent to the Maysdorf II LBA tract are shown on figure S4-6 in the SGAC Supplementary Information document.

Within the proposed lease area and adjacent study area there is no “critical” habitat designated by USFWS for T&E species. The following discussion describes species’ habitat requirements and their occurrence in the area of the Maysdorf II LBA tract and evaluates the potential environmental effects of the Proposed Action and Alternatives 2 and 3 on federal T&E species.

E4-2.1 Threatened Species

E4-2.1.1 Ute ladies’-tresses

Ute ladies’-tresses is a perennial, terrestrial orchid with erect, glandular-pubescent stems 12 to 50 cm tall arising from tuberous-thickened roots. Ute ladies’-tresses occurs primarily on moist, subirrigated or seasonally flooded soils bordering wetland meadows, springs, lakes, or perennial streams. The elevation range of known occurrences is 4,200 to 7,000 feet in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows. Most populations are found on alluvial sand, coarse silt, or whitish loamy clay with a slightly basic pH. These soils are derived from Quaternary alluvial deposits or drab Eocene- age sandstones and claystones (Fertig 2000). Ute ladies’-tresses is not found in heavy, tight clay soils, saline, or alkaline soils.

This orchid can be commonly associated with horsetail, milkweed, verbena, blue-eyed grass, reedgrass, goldenrod, bentgrass, and arrowgrass (USFWS 2005). Wyoming populations often occur in moist meadow communities

dominated by redbud, common quackgrass, Baltic rush, foxtail barley, or switchgrass within a narrow vegetative band between emergent aquatic vegetation and dry upland prairie (Fertig 2000). Vegetative cover tends to range from 75-90 percent and is usually less than 45 cm tall (Fertig 2000). The orchid seems intolerant of shade. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system.

In Wyoming, this species typically blooms from early August to early September, with fruits produced from mid-August to September (Fertig 2000). Leaves persist during flowering (Moseley 1998). Flowers are white or ivory and are clustered into a spike at the top of the stem. No direct observations of pollination have been made in Wyoming. In their 1994 report, Sipes and Tepedino indicated that large, long-tongued bumblebees in the genus *Bombus* are the primary pollinators in Utah and Colorado (Fertig 2000). Smaller bees may also visit these flowers, but have the incorrect body shape or mass to properly accommodate the orchid's large, sticky anther/pollen clusters (Fertig 2000).

This species reproduces basically by sexual reproduction and can produce as many as 7,300 tiny seeds per fruit (Fertig 2000). The plant requires mycorrhizal fungi to germinate and establish. Individual plants may not flower in consecutive years under adverse environmental conditions but will persist below ground with their mycorrhizal symbionts (Fertig 2000).

Flowers are needed for positive plant identification. The species can be reliably located only when it is flowering (Heidel 2001). Plants probably do not flower every year and may remain dormant below ground during drought years. In general, the species' best flowering years seem to correspond with extreme heat during flowering. Preliminary review of climate data also indicates that growing seasons that start out as relatively cold and wet correspond with low flowering levels (Heidel 2001).

The orchid is well adapted to disturbances from stream movement and is tolerant of other disturbances such as grazing that are common to grassland riparian habitats (USFWS 1995). Populations are often dynamic and "move" within a watershed as disturbances create new habitat or succession eliminates old habitat (Fertig and Beauvais 1999). Ute ladies'-tresses colonize early successional riparian habitats such as point bars, sand bars, and low-lying gravelly, sandy, or cobbly edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing season. The orchid has been known to establish in heavily disturbed sites, such as revegetated gravel pits, heavily grazed riparian edges, and along well-traveled foot trails on old berms (USFWS 1995).

Existing Environment: Prior to 2005, four orchid populations had been documented within Wyoming, all discovered between 1993 and 1997 (Fertig and Beauvais 1999). Four additional sites were located in 2005 and one additional site was found in 2006 (Heidel, 2007). The new locations were in the

same drainages or tributaries as the original four populations. Drainages with documented orchid populations include Antelope Creek and tributaries in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County. No occurrences have been recorded in Campbell County including the Maysdorf II vegetation general analysis area.

The Maysdorf II LBA includes a reach of the Belle Fourche River and along that reach are wetland and “moist-land” plant communities that offer seemingly possible habitat for Ute Ladies’-Tresses Orchid. Likewise, there exist isolated wet depressions along some upland drainages that support hydrophytes such as common spikerush or field clustered sedge. These latter sites were deemed unlikely though remotely possible habitat so were included in field searches. Pedestrian surveys of the Belle Fourche and isolated upland depression areas were conducted for Ute Ladies’-Tresses Orchid by ESCO Associates in August 2005 and 2006.

Playa Grassland was suggested by USFWS (personal communication) as suitable habitat and the portion of the LBA site occupied by this type was also searched in August 2006 with the same results. Eastern Wyoming playas, except during hypothetically potential extraordinary years of unrelenting spring and summer rain, would probably never naturally sustain the moist conditions required by the orchid. Even following the springs when the playas do occasionally, but only temporarily, include standing water, subsequent summer conditions accompany a thorough drying that excludes any routine manifestation of moisture-loving perennial plant species such as the orchid. The highly saline nature of certain of these interior drainages also makes it unlikely that the orchid would occur.

No individuals of the Ute ladies’-tresses orchid were located during the 2005 and 2006 surveys. Other than limited areas along the Belle Fourche River and at isolated upland depressions, most of the land within the Maysdorf II LBA tract and adjacent study area is not potential Ute ladies’-tresses habitat. This includes highly disturbed or modified sites, upland habitat types, and sites inundated by standing water.

A total of approximately 140.15 acres of wetlands and other Waters of the U.S. occur within the wetlands analysis area. Of this 140.15 acres identified, approximately 133.54 acres are vegetated wetlands and the remaining 6.61 acres are other Waters of the U.S. The majority of the wetlands are associated with the watercourses of the Belle Fourche River and Caballo Creek, diked or impounded reservoirs, and internally drained depressions/playas, while the majority of the other Waters of the U.S. are associated with ephemeral stream channels and areas of open water.

Effects of the Proposed Project: Mining the federal coal included in the Maysdorf II LBA tract, if the tract is leased under the Proposed Action or Alternatives 2 and 3, may affect, but is not likely to adversely affect Ute

ladies'-tresses. Typical suitable habitat for this species on the tract is very limited and found along the CBNG-impacted bottomlands of the Belle Fourche River and its tributaries and at isolated upland depressions. However, the quality of potential habitat is extremely poor. Outside of the narrow riparian strips located along these impacted watercourses, typical suitable habitat is rare or non-existent in the study area. Multiple surveys of the existing suitable habitat at the Cordero Rojo Mine and other mines in this area have not found any Ute ladies'-tresses. Because of the ability of this species to persist below ground or above ground without flowering, single season surveys that meet the current USFWS survey guidelines may not detect populations. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for Ute ladies'-tresses within the project area should be identified and surveyed prior to surface mining activities.

Jurisdictional wetlands located in the Maysdorf II LBA tract that are destroyed by mining operations would be replaced in accordance with the requirements of Section 404 of the Clean Water Act, as determined by COE. The replaced wetlands may not duplicate the exact function and landscape features of the pre-mine wetlands. COE considers the type and function of each jurisdictional wetland that will be impacted and may require restoration of additional acres if the type and function of the restored wetlands will not completely replace the type and function of the original wetland. Replacement of non-jurisdictional and functional wetlands may be required by the surface land owner and/or WDEQ/LQD. WDEQ/LQD allows and sometimes requires mitigation of non-jurisdictional wetlands affected by mining, depending on the values associated with the wetland features.

Cumulative Effects: Alterations of stream morphology and hydrology are believed to have extirpated Ute ladies'-tresses from most of its historical range (USFWS 2002). Disturbance and reclamation of streams by surface coal mining may alter stream morphology and hydrology. The large quantities of water produced with CBNG development and discharged on the surface may also alter stream morphology and hydrology.

E4-2.2 Endangered Species

E4-2.2.1 Black-footed ferret

The black-footed ferret, a nocturnal mammal and an obligate associate of prairie dogs (*Cynomys* spp.), was listed as endangered in March, 1967. This species is thought to have historically inhabited a nearly contiguous matrix of prairie dog colonies spanning the short-grass prairies of the eastern and southern Rockies and the Great Plains of North America (Forrest et al. 1985). Since the early 1930s, numerous factors have led to substantial declines in prairie dog colonies in that region. Reductions in some states are estimated as high as 90% from formerly occupied colonies (Rose 1973, Tyler 1968).

Conversion of grasslands to agricultural landscapes, eradication of prairie dogs, and diseases such as the plague and canine distemper have resulted in severe reductions in prairie dog colonies across the west, colonies which provided food, shelter, and habitat for black-footed ferrets. This species of ferret is currently one of the most endangered mammals in North America and was thought to be extinct until a small population was discovered in Meeteetse, Wyoming in September, 1981. Since then, successful captive breeding and reintroduction programs have released black-footed ferrets back into the wild in several western and Great Plains states including Wyoming, Montana, South Dakota, Colorado, Utah, and Arizona.

Biology and Habitat Requirements: Ferrets rely on prairie dogs to provide both shelter and food (Hillman and Clark 1980). Ferrets produce one litter per year, typically giving birth to four or five kits. The decline in ferret populations has been largely attributed to the reduction in the vast prairie dog colonies that historically existed in the western United States. Despite extensive ferret surveys over the past 20 plus years throughout Wyoming, the last known wild black-footed ferret population was discovered near Meeteetse in 1981 (Miller et al. 1996). Those surveys included numerous USFWS-approved clearances for coal mining and other development in the Powder River Basin of Wyoming, as well as the USFS surveys for ferrets on the TBNG. Reintroduction efforts involving captive bred individuals have successfully established one black-footed ferret population in the Shirley Basin area in south-central Wyoming. Currently, this is the only known black-footed ferret population within the state, though other populations are present elsewhere in the United States and Mexico.

Existing Environment: The Maysdorf II LBA tract is within the historical range of the black-footed ferret, although no black-footed ferrets are presently known to occur in northeastern Wyoming. During the 1980s, WGFD, in cooperation with other agencies, conducted searches for black-footed ferrets in Wyoming in the places they were most likely to be found, but these searches were not successful (Martin Grenier, personal communication, 10/14/2003). In a February 2, 2004 letter to interested parties, the USFWS declared that black-footed ferret surveys are no longer necessary in black-tailed prairie dog colonies within Wyoming.

Intermountain Resources has mapped the current acreage of prairie dog colonies in the vicinity of the Cordero Rojo Mine by walking the perimeters of colonies and delineating them on topographic maps. No black-tailed prairie dog colonies are currently present on the Maysdorf II LBA tract as proposed and on the area added by Alternatives 2 and 3. One black-tailed prairie dog colony is located less than 1 mile east of the Cordero Rojo Mine's current permit area while two other small colonies are located within 2 miles of the Maysdorf II LBA tract. One of these colonies is within the Maysdorf II wildlife general analysis area (figure E4-3). The boundaries shown on figure E4-3 and are historical town boundaries and, although black-tailed prairie dogs still exist

in the areas, their numbers and distribution may be much smaller than previously recorded.

Effects of the Proposed Project: Mining the federal coal included in the Maysdorf II LBA tract, if a lease is issued under the Proposed Action or Alternatives 2 and 3, would have no effect on black-footed ferrets. There are no black-tailed prairie dog colonies present on the Maysdorf II LBA tract or in the BLM study area under Alternatives 2 and 3. The black-footed ferret is almost entirely dependent on the prairie dog for survival. The reductions in black-tailed prairie dog populations due to poisoning prior to 1972 and due to recent plague outbreaks have reduced the potential for black-footed ferret survival in northeastern Wyoming. Searches of the best remaining black-footed ferret habitat in Wyoming conducted in the 1980s were not successful in finding any ferrets. General wildlife surveys and specific ferret surveys have been conducted for many years at the Cordero Rojo Mine, and at other mines in this area. No black-footed ferrets were observed within BLM study area during these surveys. Two black-tailed prairie dog colonies are located within 2 miles of the Maysdorf II LBA tract (one within the Maysdorf II wildlife general analysis area), but they are west of Highway 59 and not within the anticipated Maysdorf II disturbance area (figure E4-3).

Cumulative Effects: Mineral development within black-tailed prairie dog colonies is a leading cause of ferret habitat loss in the PRB. Surface coal mining tends to have more intense impacts on fairly localized areas, while oil and gas development tends to be less intensive but spread over larger areas. Oil and gas development and mining activities have requirements for reclamation of disturbed areas as resources are depleted. In reclaimed areas, vegetation cover may differ from undisturbed areas. In the case of surface coal mines, re-established vegetation would be dominated by species mandated in the reclamation seed mixtures (to be approved by WDEQ). The majority of the approved plant species are native to the area; however, reclaimed areas may not serve ecosystem functions presently served by undisturbed vegetation communities and habitats, particularly in the short-term, when species composition, shrub cover, and other environmental factors are likely to be different. Shifts in habitat composition or distribution following reclamation could increase or decrease potential habitat for prairie dogs and associated habitat for black-footed ferrets. However, black-tailed prairie dogs have been recorded invading and establishing towns on reclaimed coal mined lands in northeastern Wyoming (IR 2005).

Potential ferret habitat is also affected by other impacts to prairie dog populations. Plague can infect and eliminate entire prairie dog colonies. Poisoning and recreational prairie dog shooting may locally reduce prairie dog populations, but seldom completely eliminate colonies.

E4-2.2.2 Blowout Penstemon

Blowout Penstemon, a member of the figwort family, was listed as endangered on October 1, 1987. It is known from multiple populations in western Nebraska and in the Ferris dunes area in northwestern Carbon County, Wyoming. The plant was first discovered in Wyoming in 1877 and then rediscovered in 1996 (BLM 2008). The removal of fire, leveling of dunes, reduction of grazing, and cultivation of stabilizing cover crops drastically reduced the amount of habitat available for this species. Loss of habitat, coupled with impacts from insect outbreaks, drought, inbreeding, and potential over collection, has caused problems for the plant (University of Wyoming 2009). Only 3,500-5,000 plants are currently found in Nebraska at about a dozen sites. The Wyoming population is limited to three sites in northern Carbon County that contain several thousand plants (BLM 2008). Threats to the plant may occur when sand dunes are removed or overly disturbed by vehicular traffic (USFWS 2008b).

Biology and Habitat Requirements: Blowout penstemon is a perennial herb with stems less than 12 inches tall. The inflorescence is 2 to 6 inches long and has six to ten compact whorls of milky-blue to pale lavender flowers. This species typically flowers from mid-June to early-July. The plant's current know range in Wyoming is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25 to 40 percent vegetative cover (USFWS 2008b).

Existing Environment: The Maysdorf II LBA tract is not within the documented historical range of the blowout penstemon. It is located approximately 150 miles northwest of the Nebraska known occurrences and approximately 150 miles northeast of the Wyoming occurrences. No suitable sand dunes (whether stable or blownout) are currently present on the Maysdorf II vegetation general analysis area.

Effects of the Proposed Project: **Mining the federal coal included in the Belle Ayr North LBA tract, if a lease is issued under the Proposed Action or Alternative 2, would have no effect on blowout penstemon.** Typical suitable habitat for this species on the tract is non-existent. If undetected populations are present, they could be lost to surface disturbing activities. Any potential habitat that has not already been surveyed for blowout penstemon within the project area should be identified and surveyed prior to surface mining activities.

Cumulative Effects: This species is potentially vulnerable to habitat loss and degradation resulting from sand mining, water development, energy development, ORV use, and associated destabilization of its sand dune habitat. It also could be vulnerable to negative effects related to the spread of non-native species within its range.

E4-3.0 SUMMARY OF DETERMINATIONS

Table E4-1 summarizes the determinations for federally listed T&E species in the area of the Maysdorf II LBA tract that may result from implementing the Proposed Action or Alternative.

Table E4-1. Effects Evaluation of Sensitive and Federal T&E Species in the Area of the Maysdorf II LBA Tracts.

Status	Species Common Name	Potential Effects
Threatened:	Ute ladies'-tresses	May affect ¹
Endangered:	Black-footed ferret	No effect
Endangered:	Blowout Penstemon	No effect

¹ Not likely to adversely affect individuals or populations.

E4-4.0 CREDENTIALS OF SURVEY PERSONNEL

E4-4.1 Intermountain Resources of Laramie, Wyoming

Jim Orpet

Mr. Orpet obtained a Bachelors of Science degree in Wildlife Management and a Master of Science degree in Range Management from the University of Wyoming and has accumulated over 28 years of field experience in wildlife surveys. This experience includes surveys for T&E species, surveys for species of high state or federal interest and preparation of wildlife reports for over 100 projects throughout Wyoming. Mr. Orpet was qualified in 1987 by the WDEQ/LQD to conduct T&E and other plant and animal surveys on Abandoned Mine Lands (AML) projects within the state. Qualification at that time was based on review and approval of Mr. Orpet's credentials by the WGFD and the USFWS. Mr. Orpet has also completed numerous wetland surveys that have been approved by the COE.

Russel Tait

Mr. Tait obtained a Bachelor of Science degree in Wildlife Management from the University of Wyoming and has accumulated 14 years of field experience in wildlife surveys in Wyoming. Mr. Tait has assisted Mr. Orpet in completion of wildlife inventories for over nine years on coal mines and other resource development projects in Wyoming, including black-footed ferret surveys, bald eagle surveys, sage grouse lek surveys and surveys for other species of high federal or state interest.

E4-4.2 ESCO Associates Inc. of Boulder, Colorado

David Buckner

Mr. Buckner obtained a Bachelors of Arts degree, Master of Arts degree, and Ph.D. in Plant Ecology from the University of Colorado and has accumulated over 21 years of field experience in vegetation and rare plant surveys.

Mr. Buckner's rare plant survey experience includes:

- *Asclepias ruthiae*, Grand County, Utah, 1982;
- *Stellaria irrigua*, La Plata County, Colorado;
- *Sclerocactur glaucus*, Mesa and Garfield Counties, Colorado, 1987;
- *Penstemon harringtonii*, Eagle, Grand, and Routte Counties, Colorado, 1982, 1990, 1991, 1993, and 1994.

Mr. Buckner's familiarity with *Spiranthes diluvialis* includes:

- observation of flowering populations in Boulder County, Colorado, 1991-2004;
- observation of vegetative sprouts of individuals occurring in Boulder County populations, January to April 1982, June 1993, and May 1995.H-9.0

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