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Nance-Brown AVF Coal Exchange Rosebud County, Montana

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Acronyms

AAQS	Ambient Air Quality Standards
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
AVF	Alluvial Valley Floor
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAPS	Crucial Area Planning System
CBNG	Coal Bed Natural Gas
CFR	Code of Federal Regulations
CPIU	Consumer Price Index
CX	Chpt 3.6.1
DEQ	State of Montana Department of Environmental Quality
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FLPMA	Federal Land Policy Management Act
FOB	Free on Board
FWP	Montana Fish, Wildlife and Park's
FWS	U.S. Fish and Wildlife Service
GHG	Greenhouse Gases
GIS	Geographic Information Systems
GPS	Global Positioning System
GNP	Great Northern Properties
KCLA	Known Coal Leasing Area
LMU	Logical Mining Units
MAAQS	Montana Ambient Air Quality Standards
MBTA	Migratory Bird Treaty Act
MDEQ	Montana Department of Environmental Quality
MLA	Mineral Leasing Act
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrous Oxides
NPA	National Programmatic Agreement
NRCS	Natural Resources Conservation Service
O ₃	Ground Level Ozone
OSM	Office of Surface Mining
OSMRE	Office of Surface Mining Reclamation and Enforcement
PFYC	Potential Fossil Yield Classification

PODS	Plan of Development
PPL	Pacific Power and Light – Montana (PPL-MT)
PSD	Prevention of Significant Deterioration
RFD	Reasonably Foreseeable Development
RMP	Powder River Resource Area Resource Management Plan
SAR	Sodium Absorption Ratio
SHPO	State Historic Preservation Office
SIR	Supplementary Information Report
SMCRA	Surface Mining Control and Reclamation Act of 1977
SO2	Sulfur Dioxide
T/E	Threatened / Endangered Species
TDS	Total Dissolved Solids
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
TRRC	Tongue River Railroad Company
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compounds
VRM	Visual Resource Management
WECO	Western Energy Company

Chapter 1

PURPOSE OF AND NEED FOR PROPOSED ACTION

1.0 INTRODUCTION

The proposed Nance-Brown Alluvial Valley Floor (AVF) Fee Coal Exchange would exchange ownership of approximately 3,379.55 acres of fee (privately owned) coal for Federal coal that is not leased. The fee coal lands are located in T. 4 S., R. 43 E., T. 5 S., R. 43 E., T. 5 S., R. 42 E., T. 6 S., R. 42 E., T. 6 S., R. 43 E., and the Federal coal lands in T. 1 N., R. 40 E., T. 1 S., R. 41 E. (Maps 1.1, 1.2 and 1.3). All of the coal lands included in the proposed exchange are located in Rosebud County, Montana. The proposed exchange would be between the Bureau of Land Management (BLM) acting on behalf of the United States of America and Jay Nance, Brett A. Boedecker as Personal Representative for Susanne N. Boedecker, Joseph P. Hayes, Patricia Hayes Rodolph, and the Brown Cattle Company Shareholders Coal Trust (collectively Nance-Brown or the proponents). Under the proposed exchange, the BLM would exchange Federal coal identified by Nance-Brown within the “Ashenhurst Area” near Colstrip, to equal the appraised value of the ±3,379.55 acres of private coal owned by Nance-Brown in the alluvial valley floor of the Tongue River. The Ashenhurst tracts are split estate with Federal owned coal underlying privately owned surface.

Section 510(b)(5) of the Surface Mining Control and Reclamation Act of 1977 (SMCRA), 30 U.S.C. § 1260(b)(5), requires that BLM must conduct a fee coal exchange for qualified AVF proponents. *See Nance v. Kempthorne*, No. CV-06-125-BLG-RFC, at 15 (D. Mont. Dec. 21, 2007) (order denying motion to dismiss); *see also Texaco, Inc., v. Andrus*, No. 79-2448, slip op. at 4 (D.D.C. Aug. 15, 1980) and *Whitney Benefits v. Hodel*, C84-193-K (May 23, 1985). AVF exchanges are processed according to section 206 of the Federal Land Policy and Management Act of 1976 (FLPMA), 43 U.S.C. § 1716, and BLM’s applicable regulations located primarily in 43 CFR subparts 2200, 2201, 2203, and 3436.

The proponents first filed their application for an AVF exchange with BLM in December 1994. On October 10, 1997, the BLM determined that the proponents were qualified to pursue an exchange for ±3,379.55 acres of AVF fee coal. Over the years, BLM continued to process the exchange, but on August 29, 2006, the proponents initiated a lawsuit to compel the completion of the exchange. *See Nance v. Kempthorne*, No. CV-06-125-BLG-RFC (D. Mont. filed Aug. 29, 2006). Following a Court Order issued on December 9, 2008, and revised on May 19, 2009, which mandated a schedule for completion of the exchange, the parties entered into a Stipulation on November 19, 2009, and revised on January 29, 2010. This revised Stipulation allows BLM the ability to follow the regulatory process for completing an AVF exchange with a target exchange execution date of April 1, 2011.

BLM has determined an Environmental Assessment (EA) must be prepared to support BLM’s forthcoming determination as to whether any or all of the Ashenhurst Tract, identified by Nance-Brown in a March 2, 2010 Status Report in *Nance v. Kempthorne*, is appropriate to convey out of

federal ownership to fulfill the Secretary of the Interior's mandatory duty to exchange unleased federal coal for the Nance-Brown's AVF fee coal. This EA serves as BLM's environmental analysis as required by the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 *et seq.*, and 43 CFR 2201.7-1.

1.1 HISTORY OF THE NANCE-BROWN AVF COAL EXCHANGE

Nance-Brown owns coal along the Tongue River in Rosebud County, Montana. The State of Montana issued an AVF determination and a Declaratory Ruling on May 19, 1986, that certain coal lands near the Tongue River in Rosebud County, Montana, cannot be mined using surface mining methods. In December 1994, the proponents submitted an AVF coal exchange proposal to BLM seeking to exchange 3,679.50 acres of AVF fee coal for selected federal coal. During the review of the exchange proposal, BLM sought assistance from the State of Montana, Department of Environmental Quality (DEQ) to determine the amount of the acreage within the AVF. On May 15, 1996, the Montana DEQ clarified that 2,346 acres were within the AVF and could not be surface mined.

Based on this and other information, BLM issued a decision to the proponents on February 26, 1997, which stated that 3,249.68 acres of the proponents' coal qualified for an exchange under Section 510(b)(5) of SMCRA. Upon reconsideration, on October 10, 1997, a second decision was issued to the proponents. At that time, the BLM determined \pm 3,379.55 acres, of the total 3,679.50 acres the proponents proposed for exchange, would be considered for an AVF exchange. This decision was not appealed. (Bureau of Land Management, Montana State Office, Billings, MT)

After this determination was made, BLM began processing the exchange according to SMCRA, FLPMA, and the implementing regulations. BLM and Nance-Brown continued work on the exchange at various times for the next ten years.

On August 29, 2006, Nance-Brown filed a citizen suit in the Federal District Court of Montana seeking to compel an exchange of their AVF fee coal for Federal coal pursuant to 510(b)(5) of SMCRA. By an order issued on December 9, 2008, and amended on May 19, 2009, the United States District Court for the District of Montana, Billings Division ordered that the subject AVF fee coal exchange be completed by July 2, 2010. On November 19, 2009, after a settlement conference before the court, the parties executed a Stipulation that, in part, memorialized the intention of the parties to complete the exchange within 15 months (by approximately February 18, 2011). The Stipulation was revised on January 29, 2010, which extended the intended execution date for the exchange to April 1, 2011.

1.2 PURPOSE OF AND NEED FOR ACTION

The purpose and need of the proposed exchange is to comply with the exchange requirement in Section 510(b)(5) of SMCRA and the Stipulation and direction of the Court in *Nance v. Kempthorne*, as described in Sections 1.0 and 1.1, to provide Nance-Brown with acceptable federal coal for exchange while taking into consideration the BLM's land management

responsibilities to protect Federal resources and public interests related to the federal coal identified for disposal in the proposed exchange.

1.3 APPLICABLE LAWS AND REGULATIONS

The AVF coal exchange application was submitted and will be processed and evaluated under several federal statutes, including:

- Surface Mining Control and Reclamation Act of 1977 (SMCRA);
- Federal Land Policy Management Act of 1976 (FLPMA);
- Mineral Leasing Act of 1920 (MLA), as amended;
- Multiple-Use Sustained Yield Act of 1960;
- National Environmental Policy Act of 1969 (NEPA);
- Federal Coal Leasing Act Amendments of 1976;
- Energy Policy and Conservation Act of 2005.

The BLM is the lead agency responsible for the leasing or exchange of federal coal under MLA as amended. BLM is also responsible for preparation of this EA to evaluate the potential environmental impacts of the exchange and potential development of the federal coal selected for exchange.

SMCRA gives the Office of Surface Mining Reclamation and Enforcement (OSMRE) primary responsibility to administer programs to regulate surface coal mining operations and the surface effects of underground coal mining operations in the United States. Pursuant to section 503 of SMCRA, the Montana Department of Environmental Quality (MDEQ) developed and the Secretary of the Interior (Secretary) approved, Montana's permanent regulatory program authorizing MDEQ to regulate surface coal mining operations and the surface effects of underground coal mining operations on private and state lands within the state of Montana. In April 1981, pursuant to Section 523(c) of SMCRA, MDEQ entered into a cooperative agreement with the Secretary authorizing MDEQ to regulate surface coal mining operations and the surface effects of underground mining operations on federal lands in the State.

In conformance with the cooperative agreement, mine operators must submit a permit application/revision to MDEQ for any proposed coal mining and reclamation operations in Montana. MDEQ reviews the permit application/revision to insure it complies with permitting requirements and the coal mining operation will meet the performance standards of the approved Montana program. With respect to federal coal, OSMRE, BLM, and other federal agencies review the permit application/revision to insure it complies with the terms of any federal coal leases, the MLA, NEPA, and other federal laws and their attendant regulations. If the permit application/revision does comply, MDEQ issues the applicant a permit to conduct mining operations. MDEQ enforces the performance standards and permit requirements for reclamation during a mine's operation.

1.3.1 Specific Statutory and Regulatory Authority

The exchange of AVF fee coal will be completed pursuant to Section 510(b)(5) of SMCRA, which provides AVF fee coal exchanges “shall be made under section 206 of [FLPMA].” 30 U.S.C. § 1260(b)(5). Pursuant to FLPMA, the fee coal lands exchanged must be located in the same state. 43 U.S.C. § 1716(b); *see also* 43 CFR 3436.2-2. In addition, the market value of the Federal and non-Federal coal will be determined by a qualified appraiser and approved by BLM. *See, e.g.*, 43 CFR 2201.3. The coal exchanged must be of equal value, or if they are not equal, the value can be equalized by the payment of money to the grantor or the Secretary so long as the payment does not exceed 25 percent of the total value of the coal or interests transferred out of Federal ownership 43 U.S.C. § 1716(b); *see e.g.*, 43 CFR 2201.5, 2201.6, and 3436.2-3(e). In determining the value of the coal deposit underlying or near an AVF, the Secretary shall proceed as though there were no prohibition on surface coal mining operations on the property 43 CFR 3436.2-3(e). Other relevant regulations are located at 43 CFR subparts 2200, 2201, 2203, and 3436.

1.4 CONFORMANCE WITH THE APPLICABLE LAND USE PLAN

This AVF coal exchange proposal analyzed in this document is within the geographic area covered by the Powder River Resource Area Resource Management Plan (RMP), approved March 15, 1985, and is in conformance with this plan (page 8 of the Record of Decision, Powder River Resource Management Plan).

1.4.1 Coal Land Use Planning Screens

The coal screens applied in the Powder River Resource Area Resource Management Plan were completed in December, 1984. The screening process and the results of the analysis are included in Appendix D, Federal Coal Lands Review Process, of the Final RMP. A copy of the letter sent to the surface owners is also included in the Final RMP.

All the Federal coal tracts discussed with the proponents, including the selected tracts, were identified by the BLM to be acceptable for further consideration for coal leasing or exchange according to 43 CFR 3420.1-4

1.4.2 Other Relevant Documents

- Powder River Resource Area Resource Management Plan (RMP) and Environmental Impact Statement (EIS), Class I Overview of Paleontological and Cultural Resources in Eastern Montana. March 2006.
- EA prepared by the BLM for Western Energy Exploration License Application, MTM 98618, approved February 10, 2009 (MT-020-2009-0013).
- EA prepared by the BLM for Western Energy Exploration License Application, MTM 95451, approved July 12, 2006 (MT-020-2006-353).

1.5 DECISIONS TO BE MADE

BLM must determine whether to:

- Approve the AVF coal exchange, if the transfer of federal coal to the proponents is determined to be in conformance with Section 206 of FLPMA and the SMCRA and FLPMA implementing regulations; or
- Deny the AVF coal exchange.

The project area is located on the following maps (1-1, 1.2 and 1.3). The Ashenhurst Tract map shows the mineable unleased federal coal tract. The Nance-Brown non-federal coal map shows the private AVF coal tracts that have been deemed eligible for exchange under section 510(b)(5) of SMCRA.

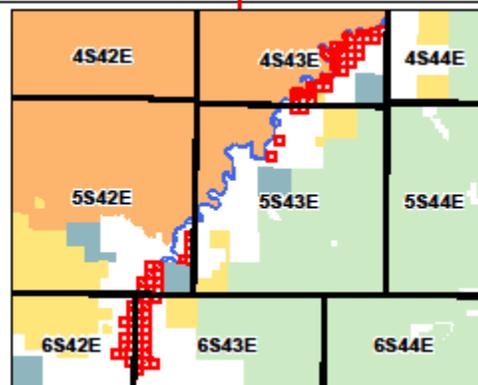
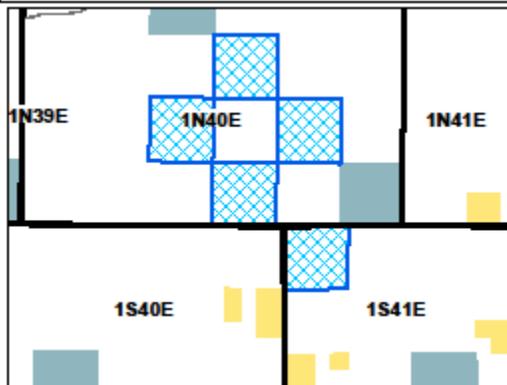
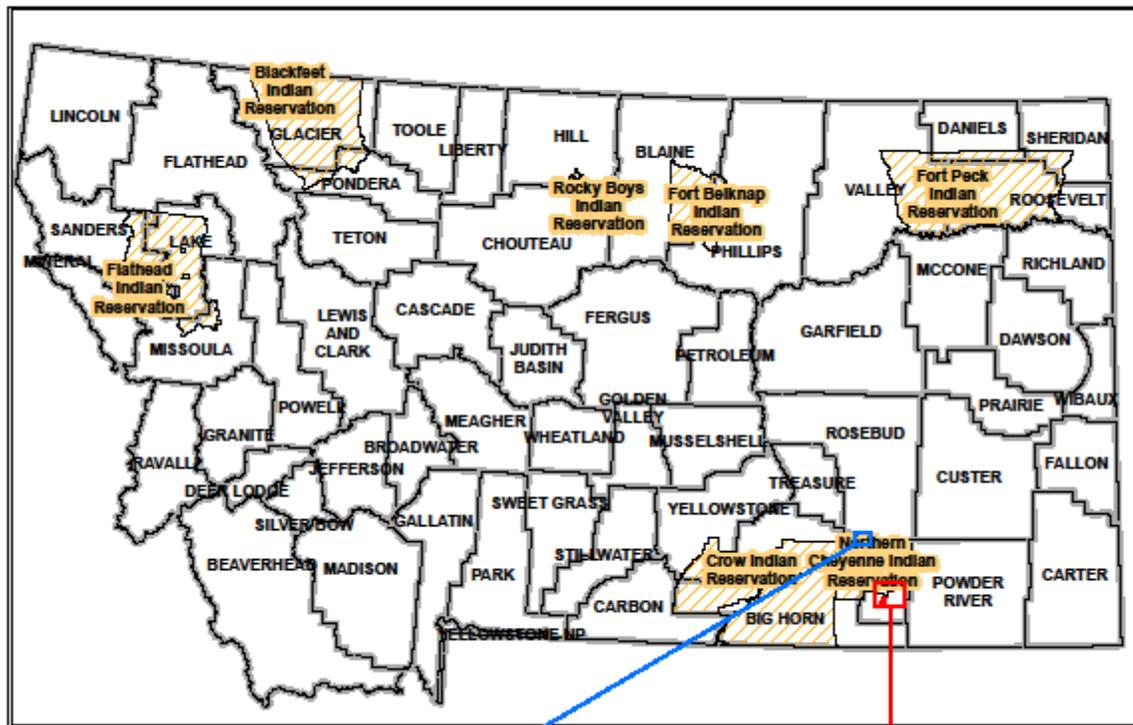
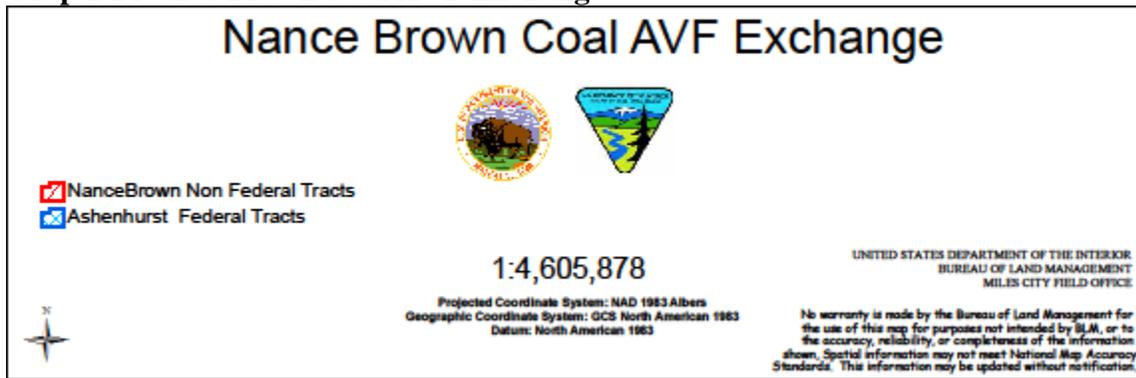
1.6 ISSUE IDENTIFICATION

Public scoping for this project was conducted through a 45 day scoping period and a public scoping meeting held on April 22, 2010. Scoping was initiated on April 8, 2010, and four comments were received through May 24, 2010.

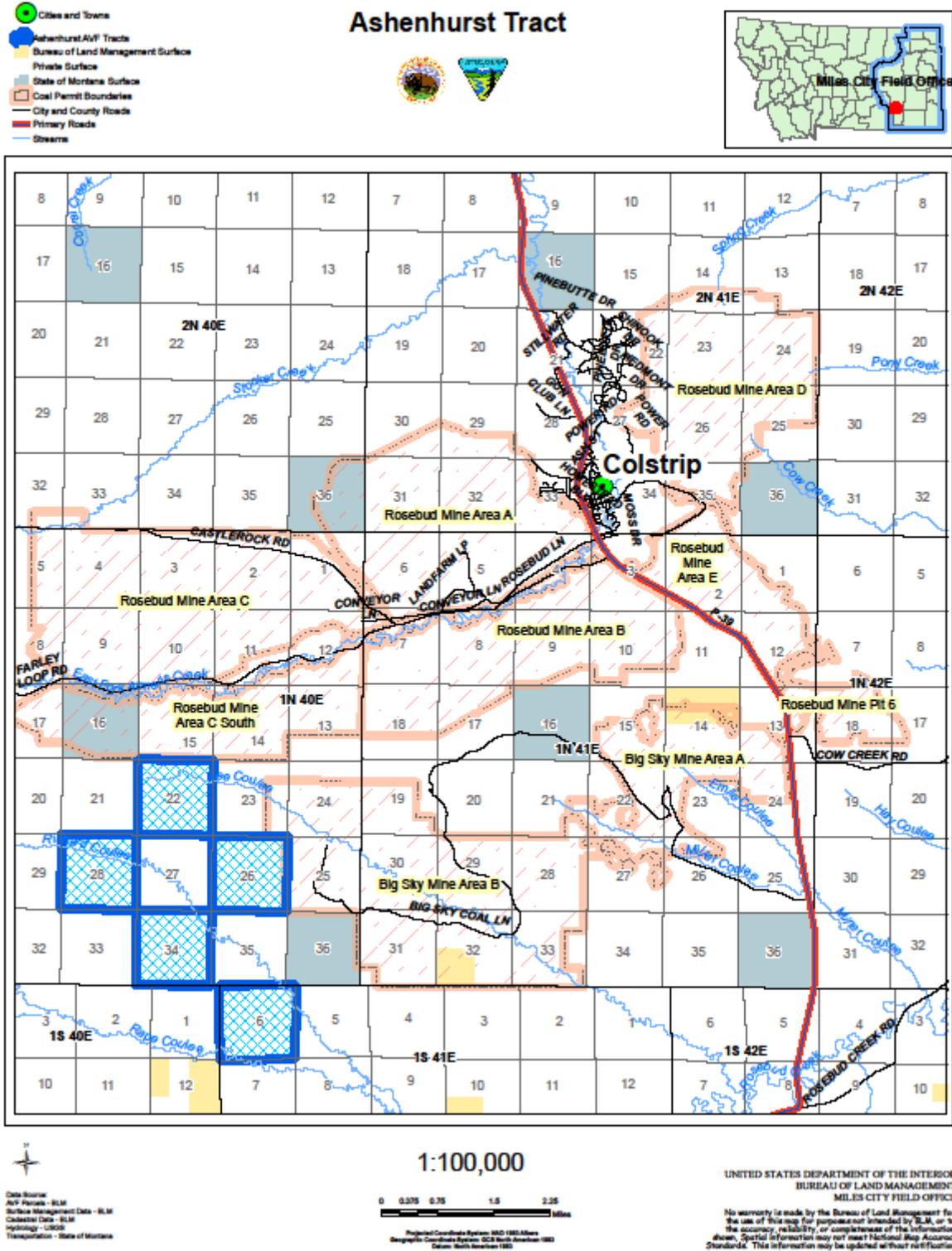
Relevant issues identified through the public scoping period for the proposed Nance-Brown coal exchange are covered in more detail in chapter 3 and 4 of this EA. A list of relevant issues, identified through the scoping process, include the potential effects of the proposed coal exchange on:

- Private surface owner rights;
- The value of private surface land;
- Cultural resources; and
- Coal leasing and mining.

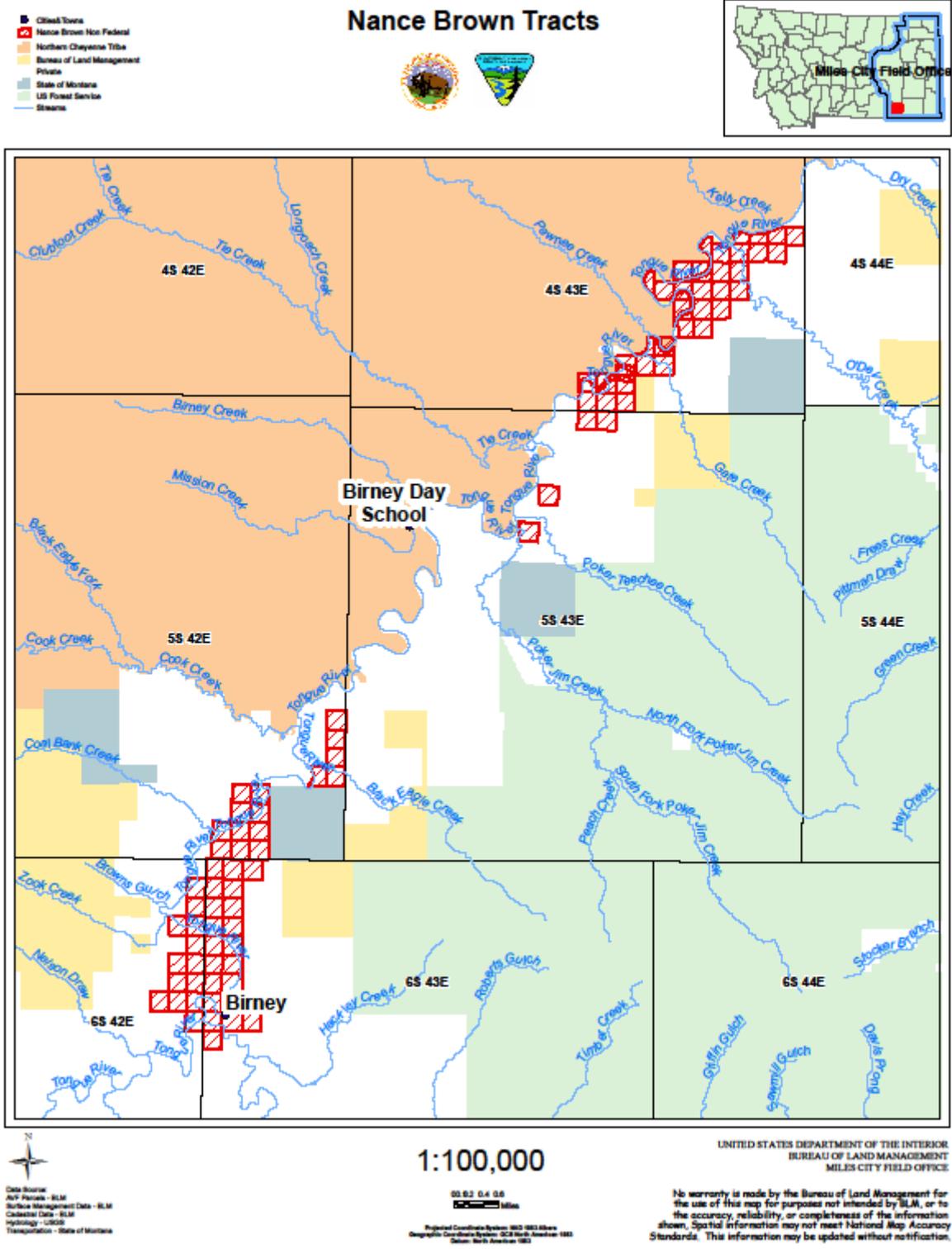
Map 1.1 Nance Brown Coal AVF Exchange



Map 1.2 Ashenhurst Tract



Map 1.3 Nance Brown Tracts



Chapter 2

ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.0 INTRODUCTION

This Chapter describes the Alternatives developed to address the issues and Alternatives considered but not analyzed in detail. The Proposed Action Alternative describes the proposed Nance-Brown AVF coal exchange and demonstrates how the proposed exchange meets the purpose and need. The No Action Alternative generally means the proposed action would not be approved or occur and demonstrates the consequences of not meeting the need for the proposed action.

The proposed exchange is in accordance with SMCRA section 510(b)(5) and the Stipulation, as amended, filed with the United States District Court for the District of Montana. The Stipulation required Nance-Brown to identify one of four tracts of unleased federal coal in Montana they would be willing to accept to satisfy the AVF fee coal exchange requirement of § 510(b)(5) of SMCRA. In March 2010, Nance-Brown chose the “Ashenhurst Tract.” The Ashenhurst Tract is near Colstrip, Montana, adjacent to the Rosebud Mine. The Ashenhurst Tract consists of unleased coal owned by the United States; the surface and other mineral interests within the Ashenhurst Tract are owned by the private parties, excluding 624.21 acres where United States owns all minerals. Once the Federal coal tract was identified, BLM began the process of analyzing whether the exchange of that tract is in the public interest in light of BLM’s statutory duty to complete the AVF fee coal exchange and other land management responsibilities.

2.1 DESCRIPTION OF THE ALTERNATIVES

2.1.1 Alternative A— Exchange of All of the Nance-Brown AVF Fee Coal for Some or All of the Federal Coal Underlying the Ashenhurst Tract (Proposed Action Alternative)

In this Alternative, BLM would exchange unleased federal coal, within the Ashenhurst Tract, to equal the value, as determined by appraisal, of approximately 3,379.55 acres of non-federal coal in the alluvial valley floor of the Tongue River owned by Nance-Brown.¹ Only coal ownership will be exchanged.

BLM would convey the federal coal to Nance-Brown by a United States patent, which would include a reservation of all federal minerals other than coal and subject to existing rights such as oil and gas leases and coal exploration licenses if any. There are 624.21 acres where all minerals other than coal would remain in federal ownership in T. 1 N., R. 40 E., Section 26, N½N½,

¹ In order to equalize the agreed upon values of the lands involved in this exchange, the exchange proposal may be modified by excluding lands and/or cash equalization to comply with 43 CFR 2201.6 after completion of the appraisals.

SW¹/₄NW¹/₄, W¹/₂SW¹/₄, SE¹/₄SW¹/₄ and T. 1 S., R. 41 E., Section 6, Lots 3, 4, 5, 6, SW¹/₄NE¹/₄, SE¹/₄NW¹/₄, NE¹/₄SW¹/₄, NW¹/₄SE¹/₄.

Nance-Brown would convey the non-federal coal to the United States of America by warranty deed free of lien or encumbrance, except as otherwise approved by the BLM. Jurisdiction of any coal acquired by the United States of America within the Northern Cheyenne Indian Reservation would be transferred to the Bureau of Indian Affairs (BIA) in Trust for the Northern Cheyenne Tribe. This Alternative satisfies the requirements of Section 510(b)(5) of SMCRA and any applicable Court Orders and Stipulations.

Map 1.6-3 shows the Nance-Brown AVF fee coal boundary and Map 1.6-2 shows the unleased Federal coal within the Ashenhurst Tract. Appendix B gives a legal description of both the Nance-Brown and Ashenhurst tracts.

2.1.2 Alternative B— No Exchange (No Action Alternative).

In this Alternative, BLM would not approve the exchange of ownership of the Nance-Brown fee coal for some or all of the unleased federal coal in the Ashenhurst Tract. The federal unleased coal in the Ashenhurst Tract would remain available for further consideration for future leasing or exchange. The Nance-Brown AVF coal would not be available for surface mining because of SMCRA and the State's AVF determination. Although Nance-Brown would still be eligible for an exchange of federal coal in Montana, selection of this alternative would further delay BLM's compliance with Section 510(b)(5) of SMCRA and any applicable Court Orders and Stipulations. This alternative would not affect the existing coal mining operations in that geographic area.

2.2 PREFERRED ALTERNATIVE IDENTIFICATION

The BLM has identified *Alternative A- Nance-Brown AVF Fee Coal Exchange*, as its Preferred Alternative. This Alternative will satisfy the requirements of Section 510(b)(5) of SMCRA and any applicable Court Orders and Stipulations, and it is in conformance with Section 206 of FLPMA and the SMCRA and FLPMA implementing regulations.

2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

When Nance-Brown first proposed this exchange in 1994, the proponents identified federal coal near a proposed Montco mine for potential exchange. In 1997, the proponents' agent indicated they wanted to reassess their choice of federal coal. Between 1997 and the time the lawsuit was filed on August 29, 2006, several federal coal lands were identified by the proponents or their agents, but a selection was not made and an agreement to initiate, as required by 43 CFR 2201.1 was not signed.

After the Court Orders in 2008 and 2009, which compelled BLM to execute an exchange, BLM discussed various federal coal tracts with Nance-Brown that could be used to satisfy the requirements of Section 510(b)(5) of SMCRA and the Court Orders. In selecting these tracts for the proponents to consider, BLM started with the premise that any unleased Federal coal in

Montana would satisfy the exchange requirements of SMCRA and FLPMA. Nance-Brown then identified four tracts for potential exchange: Pearson Creek, Colstrip Area F, Bull Mountains North, and Southwest Otter Creek. However, after further analysis, the proponents notified BLM that they would not accept any of those tracts because of their belief in the lack of near term development potential for those tracts. *See Nance v. Kempthorne*, No. CV-06-125-BLG-RFC (D. Mont. July 7, 2009) (Plaintiffs Status Report and Request for Status Conference).

As part of the settlement conference on November 19, 2009, the proponents agreed to choose at least one of three tracts for the proposed exchange. These tracts included: Bridge Creek north of the Otter Creek area, Pearson Creek area south of the Spring Creek mine, or the Ashenhurst area south of the Rosebud mine. *See Nance v. Kempthorne*, No. CV-06-125-BLG-RFC (D. Mont. Nov. 19, 2009) (Stipulation). On March 2, 2010, the proponents identified the Ashenhurst Tract as the only federal coal they would consider for exchange to fulfill the SMCRA AVF exchange requirements. *See Nance v. Kempthorne*, No. CV-06-125-BLG-RFC (D. Mont. March 2, 2010) (Plaintiffs' Status Report). Therefore, while exchange of other tracts might otherwise have been appropriate to carry forward for analysis, these have not been further considered because they were not acceptable to the proponents.

2.4 CUMULATIVE ACTIONS

Cumulative effects are the result of impacts from other past, present, or reasonably foreseeable future actions that would overlap in time and locale with the direct effects of the Proposed Action or the No Action Alternative, thus resulting in "cumulative effects" distinctly different (greater or less) than the direct or indirect effects of just the No Action Alternative or the Proposed Action Alternative. The actions listed below have been considered as potential contributors (relevant) to cumulative effects with the proposed action. A specific cumulative effects analysis for each resource is presented in Chapter 4, by alternative.

2.4.1 Relevant Past and Present Actions

Rosebud Coal Mine

Western Energy Company (WECO) began mining coal at Rosebud Mine near Colstrip, Montana in 1968. All early mine production was shipped out of state by railroad to coal fired electrical generating plants. Beginning in 1975 onsite electrical generation commenced at Colstrip from two 300 megawatt plants. With the completion of two 740 megawatt plants in 1985, coal production from the mine has averaged around 12 million tons per year. The majority of the mine's production goes to the Colstrip power generating facilities, but around two million tons per year are shipped by rail to out of state customers. The Rosebud Mine employs about 370 workers with a yearly payroll of about \$26 million.

For operational and permitting purposes, the Rosebud Mine is divided into discrete mining areas designated as A, B, C, and D. Production from Areas A and B, located just west of Colstrip, supplies coal to WECO's out of state customers. An open-air stockpile, tipple, and rail loop are located between these two mining Areas to handle loading of unit trains. Area C coal production is supplied to Colstrip Units 3 & 4. An overland conveyor belt transports the coal from the Area

C crusher to the power plants, a distance of about 4.6 miles. Area D is located adjacent to Colstrip Units 1 & 2 and supplies coal by truck haulage to these two plants.

WECO was issued a Federal Coal Exploration License by the BLM for the unleased coal in the Ashenhurst Tracts approved as of March 1, 2010. The plan calls for the drilling of 40 exploration holes for the purpose of defining the quantity and quality of the coal deposit.

WECO has a permit covering 25,624 acres for the Rosebud Mine. Through the end of federal fiscal year 2009, over 16,645 acres have been disturbed and 7,499 acres have been reclaimed. Reclamation bonds in excess of \$152 million are being held jointly by the State of Montana and OSMRE pending complete and final reclamation. An appreciable amount of the disturbed acres are tied up in mine facilities, haulroads, and mine buildings which will be unreclaimed until the mine closes down.

Big Sky Coal Mine

Peabody Coal Company began mining coal at Big Sky Mine near Colstrip, Montana in 1969 and closed in 2003. All mine production from the Big Sky Coal Mine was shipped out of state by railroad to coal fired electrical generating plants in the Upper Midwest. Coal production from the mine averaged around 2.3 million tons per year.

For permitting purposes, the Big Sky Mine was divided into mining areas designated as A and B. Mine Area A, located three miles south of Colstrip, opened in 1969 and closed in 1989. An enclosed coal barn, tipple, and rail loop were located adjacent to this area to handle loading of unit trains. Area B, three miles to the west of the loadout, was opened in 1989 and produced until 2003. The mine is now undergoing final reclamation including removal of all the coal handling facilities.

With two separate mining permits, the Big Sky Mine had 7,633 acres permitted for mining. Through the end of federal fiscal year 2009 over 3,918 acres have been disturbed and 3,760 acres have been reclaimed. Reclamation bonds in excess of \$17 million are being held jointly by the State of Montana and OSMRE pending complete and final mine reclamation.

Absaloka Mine

The Absaloka Mine is a surface coal mine located on and adjacent to the Crow Indian Reservation, owned and operated by Westmoreland Resources, Inc. The mine is located 10-12 miles west of the Rosebud Mine. Through the end of the federal fiscal year 2009 over 4,463 acres have been disturbed and 2,694 acres have been reclaimed. Reclamation bonds in excess of \$21 million are being held jointly by the State of Montana and OSMRE pending complete and final mine reclamation.

The Absaloka Mine produces 5 to 7 million tons of coal per year. All production is shipped by rail to electrical generation plants in the Upper Midwest. The Absaloka Mine employs about 210 workers with a yearly payroll of about \$11 million.

Gravel/Scoria Pits

Some gravel or scoria would be used to surface project area roads and would come from already permitted mineral material sites.

Colstrip Electrical Generating Facility,

The mine and the town were established in 1924 by the Northern Pacific Railway to provide coal to their steam locomotives. The railroad switched to diesel locomotives in 1958 and sold the mine and town to Montana Power Company in 1959. The Western Energy Company, a subsidiary of the Montana Power Company, resumed strip mining at Colstrip in 1968 to supply coal to the Corrette plant in Billings. In 1971, Montana Power and their Washington and Oregon utility partners began construction on two 330 megawatt mine-mouth power plants in Colstrip. The first Unit was completed in 1975 and Unit 2 in 1976. Then in 1980 the utilities began construction of two 776 megawatt units; Unit 3 was completed in 1984 and Unit 4 in 1986. Montana Power Company operated the plants until 1998 when its interests in the plants were sold to Pacific Power and Light – Montana (PPL MT). PPL MT is the current owner and operator.

Railroads

The Colstrip area railroad spur was constructed around 1968 to support the coal shipping activities of the Rosebud Coal Mine and Big Sky Coal Mine. Since the Big Sky Coal Mine stopped all development activities, Rosebud Coal Mine is the only shipper of coal by rail. The rail line runs from Colstrip north 30 miles until it intersects the main rail line located 6 miles west of Forsyth, Montana. Rosebud Coal Mine ships around 2 million tons of coal per year.

The Absaloka Mine railroad spur was constructed around 1974 to carry coal shipments from the mine load out to the main rail line just east of Hysham, Montana, a distance of about 35 miles. Approximately 5 to 7 million tons are being shipped per year.

Livestock Grazing

Livestock grazing occurs on all of the lands within the Ashenhurst Tract as well as on other lands adjacent to the Rosebud Mine. Livestock grazing would likely continue on lands not affected by mining operations.

2.4.2 Reasonably Foreseeable Future Actions

Western Energy Coal Mine Expansion, Rosebud Mine, PPL of Montana

BLM has granted Western Energy Coal Mine permit to drill exploratory test holes within the Ashenhurst Tract. Thus, the Rosebud Mine may potentially expand in a southern direction. This potential mine expansion is described in detail in Appendix A.

Tongue River Railroad

On October 9, 2007, the Surface Transportation Board issued a decision regarding the Final Supplemental Environmental Impact Statement for the Tongue River Railroad Company's (TRRC) to allow rail line construction and operation in Rosebud and Big Horn Counties, Montana. The document analyzed the 17.3 mile "Western Alignment" route, which had been preceded by two related applications that were considered and approved by the Board in 1986 and 1996, respectively. The Western Alignment is an alternative route for the southernmost portion of the 41-mile Ashland to Decker alignment; known as the Four Mile Creek Alternative. The Western Alignment bypasses the Four Mile Creek alignment, which is generally located from the Birney Road (Hwy 566) and the Tongue River Canyon junction, running west to Hwy 314, then south to the Decker Mine. The Western Alignment would continue south along the Tongue River on the ridge, but paralleling the river and ending around the Spring Creek Mine area. At this time, no construction operations have begun.

Otter Creek Mine

The Montana State Land Board voted at the March 18, 2010 meeting to approve the lease of the Otter Creek tracts totaling 9,543 acres to Ark Land Company, a subsidiary of Arch Coal. The leases were consummated in April of 2010. The three Otter Creek Tracts contain approximately 572.3 million tons of recoverable coal. Arch had previously leased the intervening privately owned tracts containing about 731 million tons from Great Northern Properties (GNP) in November 2009.

Arch's proposed mining plans are currently under development and are unknown at this time. However the State of Montana contracted valuation study identified two possible Logical Mining Units (LMUs), one to be located on each side of Otter Creek. It was assumed that mine production will begin in year nine of the primary term of the coal leases. It was assumed that two years will be required for baseline studies, five years for permitting, and two years for mine construction. Starting in the ninth year, it is assumed that that coal extraction would commence. The valuation study LMUs were designed to be standard surface mining dragline operations with production to be shipped to existing power plants over the proposed Tongue River Railroad. This study estimated total production from the two LMUs to be around 33 million tons per year.

Chapter 3

Affected Environment

3.0 INTRODUCTION

This Chapter describes the affected environment, including the cultural, historical, social and economic conditions that could be affected by implementation of the alternatives described in Chapter 2. Aspects of the affected environments described in this chapter focus on the relevant issues listed in Chapter 2.

The following areas of the affected environment were determined not to be present or not potentially impacted and will not be discussed further in this document: floodplains, wilderness values, Areas of Critical Environmental Concern (ACECs), prime or unique farmlands, wild and scenic rivers.

3.1 AIR QUALITY

The air quality of any region is controlled primarily by the magnitude and distribution of pollutant emissions and the regional climate. The transport of pollutants from specific source areas is strongly affected by local topography.

Air quality conditions in rural areas are likely to be very good, as they are characterized by limited air pollution emission sources (few industrial facilities and residential emissions in the relatively small communities and isolated ranches) and good atmospheric dispersion conditions, resulting in relatively low air pollutant concentrations. However, the potential exists for localized pockets of high concentrations of PM₁₀, sulfur dioxide (SO₂), and nitrogen dioxide (NO₂), due to the large number of minor sources in the area (BLM 2005b).

Surface coal mining activities generate fugitive dust and particulate and gaseous tailpipe emissions from large mining equipment. Specifically, activities such as blasting, excavating, loading and hauling of overburden and coal, and wind erosion of disturbed and unreclaimed mining areas produce fugitive dust. Coal crushing, storage, and handling facilities are the most common stationary or point sources associated with surface coal mining and preparation. Particulate matter is the pollutant emitted from coal mine point sources, although small amounts of gaseous pollutants are emitted from small boilers and off-road diesel engines.

Blasting is also responsible for another type of emission from surface coal mining. Overburden and coal blasting sometimes produces gaseous, orange-colored clouds that contain NO₂. Exposure to NO₂ may have adverse health effects. NO₂ is one of several products resulting from the incomplete combustion of explosives used in the blasting process.

Other existing air pollutant emission sources within the region include:

- CO, NOX, particulates (PM10 and PM2.5), sulfur dioxide (SO2), and volatile organic compounds (VOCs) from gasoline and diesel vehicle tailpipe emissions;
- Particulate matter (dust) generated by vehicle travel on unpaved graded roads, agricultural activities such as plowing, and paved road sanding during the winter months, as well as windblown dust from neighboring areas;
- NO2 and PM10 emissions from railroad locomotives used to haul coal;
- SO2 and NOX from power plants. The closest coal-fired power plants are the Colstrip plant, located about 8 miles northeast of the Ashenhurst Area, and the Hardin plant, located about 50 miles west of the Ashenhurst Area;
- Air pollutants transported from emission sources located outside the Powder River Basin; and
- Ground level ozone (O3) is not emitted directly into the air, but is created by chemical reactions between NOX and VOCs in the presence of sunlight.

The basic regulatory framework that governs air quality in Montana is the Environmental Quality Act, the accompanying Air Quality Rules and Regulations (Montana Ambient Air Quality Standards [MAAQS]), and the Air Quality Bureau of the Montana Department of Health and Environmental Sciences approved by the Environmental Protection Agency (EPA) under the Clean Air Act. This regulatory framework includes state air quality standards, which must be at least as stringent as National Ambient Air Quality Standards (NAAQS) (Table 3.1), and allowable increments for the prevention of significant deterioration (PSD) of air quality.

The program is designed to limit the incremental increase of specific air pollutants from major sources of air pollution above a legally defined baseline level, depending on the classification of a location. The Ashenhurst Area and surrounding area is classified as PSD Class II. The closest PSD Class I area, the Northern Cheyenne Indian Reservation, lies approximately 12 miles south of the Ashenhurst Area.

State governments designate areas within their borders as being in “attainment” or “non-attainment” with the Ambient Air Quality Standards (AAQS). The Ashenhurst Tract is in an area that is designated an attainment area for all pollutants. The town of Lame Deer, Montana, located about 16 miles south of the Ashenhurst Area, is a non-attainment area for PM10. The towns of Laurel and Billings, Montana, non-attainment areas for SO2, are located about 90 miles west of the project area. None of these cities/towns are in line with prevailing winds. There are no non-attainment areas for particulates finer than 2.5 microns in effective diameter (PM2.5) in southeastern Montana (MDEQ/ARM 2009a)

Table 3-1. Federal and Montana Ambient Air Quality Standards.

Emissions	Averaging Period	Montana Standard (MAAQS)	Federal Standard (NAAQS)
Carbon Monoxide (CO)	1-hour ^a	23 ppm ^a	35 ppm ^a
	8-hour ^a	9 ppm ^a	9 ppm ^a
Sulfur Dioxide (SO ₂)	1-Hour	0.50 ppm ^h	--
	3-hour ^a	--	0.50 ppm ^a
	24-hour ^a	0.10 ppm ^{b,j}	0.14 ppm ^{a,i}
Nitrogen Oxide (NO _x)	annual	0.02 ppm ^e	0.03 ppm ^d
	1-Hour	0.30 ppm ^b	--
Hydrogen Sulfide	annual	0.05 ppm ^e	0.053 ppm ^d
	1-Hour	0.05 ppm ^b	--
Ozone (O ₃)	1-hour ^a	0.10 ppm ^b	0.12 ppm ^f
	8-hour ^a	--	0.08 ppm ^g
PM ₁₀	24-hour ^a	150 µg/m ^{3 k}	150 µg/m ^{3 k}
	annual	50 µg/m ³	--
PM _{2.5}	24-hour ^a	--	35 µg/m ^{3 m}
	annual	--	15 µg/m ^{3 n}
Visibility	annual	3 x 10 ⁻⁵ /m ^e	--
Lead (Pb)	90-Day	1.5 µg/m ^{3 c}	1.5 µg/m ^{3 c}

^a Federal violation when exceeded more than once per year.

^b State violation when exceeded more than once per year.

^c Not to be exceeded (ever) for the averaging time period as described in the state and/or federal regulation.

^d Federal violation when the annual arithmetic mean concentration for a calendar year exceeds the standard.

^e State violation when the annual arithmetic average exceeds the standard.

^f Applies only to NA areas designated before the 8-hour standard was approved in July, 1997. Mt. has none.

^g Federal violation when 3-year average of the annual 4th-highest daily max. 8-hour concentration exceeds standard.

^h State violation when exceeded more than 18 times in any 12 consecutive months.

ⁱ Federal standard is based upon a calendar day (midnight to midnight).

^j State standard is based upon 24-consecutive hours (rolling).

^k State and federal violation when more than one expected exceedance per calendar year, averaged over 3-years.

^l State and Federal violation when the 3-year average of the arithmetic means over a

Table 3-2. Maximum Allowable Increases for Federal Prevention of Significant Deterioration of Air Quality.

Emission	Averaging Time	Maximum Allowable Increments of Deterioration ($\mu\text{g}/\text{m}^3$)		
		Class I	Class II	Class III
PM ₁₀	Annual Geom.	4	17	34
	Mean	8	30	60
	24-hour			
Sulfur Dioxide (SO ₂)	Annual Arith.	2	20	40
	Mean	5	91	182
	24-hour ^a	25	512	700
Nitrogen Dioxide (NO ₂)	3-hour			
	Annual Arith. Mean	2.5	25	50

^a Maximum allowable increment may be exceeded once per year at any receptor site.
Source: MDEQ/ARM (2009b).

3.2 CLIMATE CHANGE

Climate change refers to any significant change in measures of climate, such as temperature or precipitation, which last for an extended period of time (decades or longer). Climate change and climate science are discussed in detail in the Climate Change Supplementary Information Report for Montana, North Dakota, and South Dakota, Bureau of Land Management (URS 2010).

The Intergovernmental Panel on Climate Change (as cited in URS 2010) states that “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.” Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24° N) have exhibited temperature increases of nearly 2.1°F since 1900, with nearly a 1.8°F increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of greenhouse gases (GHGs) are likely to accelerate the rate of climate change.

As discussed and summarized in URS (2010), current ongoing global climate change is believed by scientists to be linked to the atmospheric buildup of GHGs, which may persist for decades or even centuries. While GHGs can result from either natural (i.e. solar changes and volcanic activity) or human (i.e. the burning of fossil fuels) related causes, the buildup of GHGs such as CO₂, methane, N₂O, and halocarbons since the start of the industrial revolution has substantially increased atmospheric concentrations of these compounds compared to background levels. At such elevated concentrations, these

compounds absorb more energy from the earth's surface and re-emit a larger portion of the earth's heat back to the earth rather than allowing the heat to escape into space than would be the case under more natural conditions of background GHG concentrations.

A number of activities contribute to the phenomenon of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years.

North Dakota, Montana and South Dakota are all in the lower third of GHG emitting states (by volume). North Dakota ranks 37, Montana ranks 42, and South Dakota ranks 43. Only Hawaii and Idaho have lower emissions than Montana and South Dakota among western states (http://assets.opencrs.com/rpts/RL34272_20071205.pdf, Ramseur 2007). Montana, North Dakota, South Dakota combine for 1.8 percent of the United States' (U.S.) greenhouse gas emissions.

3.2.1 Montana's Contribution to U.S. and Global Greenhouse Gases (GHGs)

Montana's GHG inventory

(<http://www.eia.doe.gov/oiaf/1605/archive/gg04rpt/emission.html>, Center for Climate Strategies 2007) shows that activities within the state contribute 0.6 percent of U.S and 0.076 percent of global GHG emissions (based on 2004 global GHG emission data from the IPCC, summarized in URS 2010). Based on 2005 data in the state-wide inventory, the most pronounced source of Montana's emissions is the use of electricity, which accounts for about 27 percent of Montana's emissions. The next largest contributors are the agriculture and transportation sectors (each at approximately 22 percent) and fossil fuels (13.6 percent). All of the fossil fuels produced and processed in Montana are responsible for approximately 0.010 percent of total global GHG emissions. Inventories at the state and national levels considered a broad range of both sources and sinks.

3.3 CULTURAL RESOURCES

3.3.1 Introduction

Cultural resources are defined by the Bureau of Land Management Cultural Resources Manual 8100 as "a definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence." Cultural resources include "archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups."

A review of existing cultural resource data and information (Class I overview) conducted by BLM provides a baseline cultural context study for the project area and notes that 18.4% (n=1301) of all prehistoric sites and 11.2% (n=321) of all historic sites recorded in Eastern

Montana occur in Rosebud County Prehistoric site types most commonly recorded in the region include rock art, surface and bedrock lithic material quarries, rockshelters, rock structures such as trapping pits, hunting blinds, vision quests, or fortification structures, stone rings, stone cairns, stone alignments, bison processing areas, and lithic reduction areas. Diagnostic artifacts and radiocarbon dates of sites within the project area date as early as the Agate Basin Phase of the Early Precontact/ Paleoindian Period (ca. 10,500 BP – 7800 BP) and include site complexes extending through all of North American prehistory. Historic cultural resources expected in the vicinity of the project area include homesteads and related structures, refuse dumps, transportation features, and military related sites (Aaberg et al. 2006).

3.3.1.1 Previous Inventory

A review of the Montana State Historic Preservation Office and BLM (Miles City Field Office) databases and records indicate that previous cultural resource investigations have been completed in the proposed project area. These previous inventories include large-scale block inventories covering portions of the project area in relation to the neighboring Big Sky Mine and Rosebud Mine, as well as site specific inventories for exploratory wells, access roads, and homesteads (Ferguson 2009, Fredlund, 1980, Greiser, T. et al. 1985, Munson and Ferguson 2002, Schweigert 1983).

Previously recorded cultural resources in the Ashenhurst Area are outlined in Appendix D. These sites were monitored for condition changes, or rerecorded to meet current definitions during the 2010 inventory. Of the eight previously recorded resources, two are historic homesteads (24RB0333/1923, 24RB0393/1913) (Fredlund 1980, Greiser 1985, Schweigert 1983), that may be contributing elements of the National Register Eligible Lee Community Historic District (24RB2053) (Munson and Ferguson 2002), three are historic homesteads with unevaluated National Register status (24RB1912, 24RB1915, 24RB1916), one is a prehistoric lithic scatter not recommended for inclusion National Register status (24RB2282), and one is a prehistoric petroglyph site with historic elements recommended eligible for inclusion on the National Register of Historic Places (24RB2281) (Ferguson 2009). Site 24RB2282 was rerecorded to include an expanded boundary, features, and diagnostic artifacts.

Of the previously recorded cultural resources, at least one petroglyph site (24RB2281) has been recommended eligible for inclusion on the NRHP, requiring mitigation and protective measures to be taken to protect the site and its integrity from future disturbance (Ferguson 2009). The Lee Community Historic District (24RB2043) is recommended as eligible for the NRHP under Criterion A; the National Register nomination has not been completed and was recommended for additional research on the community be conducted prior to disturbance from mining related activities (Munson and Ferguson 2002). Two previously recorded homesteads (24RB0333/1923, 24RB0393/1913) may be contributing elements to the Lee Community Historic District and require additional research prior to disturbance.

3.3.1.2 2010 Inventory

BLM completed a cultural resource block inventory (Class III) of approximately 3200 acres in the Ashenhurst Area in June, July, and August 2010. A total of 49 newly identified cultural properties were recorded in the proposed project area (Table 3.2.1.2). Forty-three of the sites are prehistoric, three of the sites are historic, and three of the sites have both historic and prehistoric components. A total of 33 newly and previously recorded sites have been recommended for inclusion on the National Register of Historic Places (NRHP); 29 are prehistoric sites and two are combined historic and prehistoric sites. Three additional sites have been recommended as contributing elements to the Lee Community Historic District. A total of 70 isolated occurrences of cultural material were identified in the project area. Isolated occurrences are generally not considered eligible for listing on the NRHP. Many of the isolated occurrences identified in the project area were later incorporated within the boundary of larger sites (Blythe 2010).

3.3.2 Traditional Cultural Values

An Ethnographic Overview of Southeast Montana (Peterson and Deaver 2002) was also conducted for the region containing the Ashenhurst Area. The study identified water and a number of site types as culturally sensitive and also urged avoidance of all sites where possible. The Northern Cheyenne Tribal Document (NCT 2002) and Crow Tribal Document (CTI 2002) prepared for the 2003 Statewide Oil and Gas EIS also identified a number of site types as being culturally sensitive to the tribes. These include large stone ring sites, isolated fasting beds, rock art sites and large diameter fasting structures such as medicine wheels. A review of the documents prepared by the Northern Cheyenne Tribe (NCT 2002) and the Ethnographic Overview of Southeast Montana (Peterson and Deaver, 2002) does not indicate the presence of any springs or Northern Cheyenne Homesteads listed within the boundaries of the project area.

The ethnographic studies (Peterson and Deaver 2002, Kooistra-Manning et al. 1993) have not identified any ethnographic landscapes.

The Colstrip area is known to contain features of concern, such as burials, which may be marked by cairns, communal kills sites, stone rings, petroglyphs or other rock art, vision quest sites and environmental locations where plants, water or mineral were gathered. Some of the sites identified in the cultural resource inventory of the Ashenhurst Area are types identified as having cultural significance to the Crow and Northern Cheyenne Tribes.

The coal tracts that would be acquired from Nance-Brown occur in what has been identified as Traditional Cultural Properties District along the Tongue River between Prairie Dog Creek and just north of Ashland, Montana. The proposed district was identified in the 2006 Landscape Scale Overview of the High Potential Coal Bed Natural Gas Development Area. The overview noted the Northern Cheyenne relationship with the Tongue River Valley is comprised of many different facets which are united by a spiritual connection to the river, plants, minerals, and remembered places there. This relationship meets the criteria found in National Register Bulletin 38 for a Traditional Cultural Property

District (McCormick et al 2006).

3.3.3 Indian Trust Assets

"Indian Trust Assets" means lands, natural resources, money, or other assets held by the Federal Government in trust or restricted against alienation for Indian tribes and individual Indians (Secretarial Order No. 3215, April 28, 2000). Trust is a formal, legally defined, property-based relationship that depends on the existence of three elements: (1) a trust asset (lands, resources, money, etc.); (2) a beneficial owner (the Indian tribe or individual Indian allottee); and (3) a trustee (the Secretary of the Interior). Cultural resources and sacred sites on BLM administered lands are not Indian trust assets. Human remains and cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are not Indian trust assets (BLM Cultural Resources Handbook H-8210: *Guidelines for Conducting Tribal Consultation*). The Ashenhurst Area does not include any Indian Trust Assets.

Jurisdiction of any coal acquired by the United States of America within the Northern Cheyenne Indian Reservation would be transferred to the Bureau of Indian Affairs (BIA) in Trust for the Northern Cheyenne Tribe. The Northern Cheyenne Tribe has a Class I PSD Airshed for the reservation and has water rights under the Winters Doctrine on the Tongue River. BLM has a Trust responsibility to ensure that these are not impaired by the proposed exchange. The Miles City Field Office has met with the Northern Cheyenne Tribe and sent a letter introducing the proposed Nance-Brown coal exchange.

3.4 PALEONTOLOGICAL RESOURCES

The Ashenhurst Area is located in an area that contains the Tongue River – Fort Union formation. The formation that has been rated as having moderate potential(3a) to yield vertebrate fossils in the Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands. As a result, no paleontological surveys are necessary. The cultural surveys of the area did not locate or identify any surface exposures of the underlying geologic formations and review of the Miles City Field Office's RMP Class I Paleontological Database (BLM) did not indicate any paleontological localities having been located in the Ashenhurst Area.

3.5 GEOLOGY AND MINERALS

The Powder River Basin is an asymmetric structural and physiographic basin that was formed by mountain building during the Paleocene and Eocene times. It is within the Great Plains Physiographic Province and is almost completely surrounded by structural highlands: the Black Hills Uplift to the east; the Hartville Uplift, Laramie Mountains, and Casper Arch to the south; the Big Horn Uplift to the west; and the Miles City Arch to the north.

The basin contains over 16,000 feet of sedimentary rocks on a Precambrian crystalline core. About 11,000 feet of the rocks are Cambrian to Cretaceous pre-tectonic deposits that crop out discontinuously around the edges of the basin. The pre-tectonic deposits are

composed of Paleozoic marine limestones and sandstones that are relatively uniform in composition and thickness. Above the Paleozoic rocks are continental and shallow marine shales and claystones that range in age from Triassic to early Cretaceous. The remaining sediments are approximately 5,000 feet of Tertiary rocks resulting from the Laramide deformation. The freshwater sedimentary rocks of the Eocene Wasatch Formation overlie most of the basin. The Paleocene Fort Union Formation is immediately beneath the Wasatch and crops out as a band around it.

The axis of the basin is west of the basin's center and trends north-south. The Tertiary rocks surrounding the basin generally dip 2 to 3 degrees toward the center of the basin. The Cretaceous rocks dip more steeply than Tertiary rocks. Faults are relatively rare in most of the basin. The Rosebud Mine is in the northern part of the Powder River Basin and is located west of the structural axis of the basin.

The Fort Union Formation is the surface unit within the study area. It is typically poorly consolidated and consists of light brown and gray interbedded sandstone, silty shale, carbonaceous shale, clay and coal. The coals include the Rosebud seam, the McKay, Stocker Creek, Robinson, and Burley beds.

The overburden is typically interbedded shale, siltstone and sandstone. Some zones in the sandstone are well cemented and form cliffs in outcrops. The outcrop of the Rosebud coal seam is often burned, leaving deposits of baked and fused rock (commonly known as clinker or scoria). Overburden thicknesses range from 0 to 336 feet from the northern edge of the lease to its southern side, respectively.

The Ashenhurst Area is logically positioned to be a southward extension of Area C South of the Rosebud Mine which mines coal from the Rosebud coal seam. The coal reserve underlying the Ashenhurst Area has been determined to contain approximately 217.7 million tons of recoverable coal at an average stripping ratio of about 6:1 (BCY: Ton). The coal resource of the Ashenhurst Area is based upon the Rosebud coal seam. The Rosebud coal seam thickness runs from 26 feet to 16 feet in the reserve area. It is thinnest and separates in two or more benches in the southernmost reaches of the reserve area around the mouth of Richard Coulee. Overburden depths vary from lows of 50-100 feet in the coulee bottoms to over 300 feet beneath the ridges separating the coulees. Rosebud coal seam quality is expected to be consistent with production from the Rosebud and Big Sky Mines; which is 8,600-8,700 BTU/lb, 0.75 to 1.0% Sulfur. This preliminary reserve estimate is based upon work contained in the Coal Resource Occurrence Study conducted by the Colorado School of Mines for the USGS in 1979.

3.5.1 Coal Bed Natural Gas (CBNG)

The CX Field is the closest producing coal bed natural gas (CBNG) field to the Ashenhurst Tract; it is approximately 45 miles south of the Ashenhurst Tract area. The production in the CX Field comes mainly from these four coal beds; the Deitz, Carney, Monarch and Wall. These coal beds outcrop prior to reaching the Ashenhurst Area. The Knobloch coal bed is the coal bed nearest to the Ashenhurst Tract that does produce CBNG in some wells

in the CX field; however, it outcrops near the Ashenhurst Area area, resulting in a low potential for CBNG production because any gas that may have been present in the coal bed would probably have escaped to the atmosphere and the coal is at such a shallow depth that the hydrostatic pressure would not be great enough to retain gas in the coal matrix. The Knobloch coal may have gas present but it would not be in economic quantities.

The deeper Flowers-Goodale coal bed has not been tested for CBNG production this far north in Rosebud County. The Montana Bureau of Mines and Geology has evaluated CBNG in the northern portion of the Powder River Basin and has indicated that it has a low potential for commercial production.

3.5.2 Conventional Oil and Gas

The nearest producing gas wells are in the Liscom Creek field, which is located approximately 30 miles east of the Ashenhurst Area. The wells in Liscom Creek are producing from the Shannon formation.

Approximately 60 oil and gas wells have been drilled within 20 miles of the Ashenhurst Area. Of these wells only one had a gas test but this well was plugged. It was approximately 19 miles north of these tracts. The gas show was from the Eagle formation. Other wells have had slight shows of gas but no test results have been reported. The nearest well having an oil show was in Section 3 T. 1 S., R 42 E., but no amount of oil was reported and the well was plugged. These wells have been drilled to a total depth from 608 feet to 10,660 feet and have all been dry holes. A review of the surrounding wells indicates a low potential for conventional oil or gas occurrence or production.

3.6 HYDROLOGY

3.6.1 Ground Water

Groundwater resources in the area include shallow aquifers in the valley fill materials of West Fork Armells Creek, and tributaries which are used as a livestock water source because of their shallow water table. The sub-McKay portion of the Tongue River Member of the Fort Union Formation is the most widely used aquifer in the area. The Rosebud coal seam is occasionally used as a groundwater source. Because of its low productivity the McKay coal seam is seldom used as a groundwater source.

Groundwater in the area is predominantly used for stockwater and domestic uses. Groundwater is not available in sufficient quantity or of high enough quality to be used for irrigation. Groundwater is used for domestic purposes from various aquifers below the Rosebud coal seam is not of suitable quality to meet federal drinking water standards and is seldom desired as a source of drinking water (DOI-BLM-MT-020-2009-0013). There are two stockwater wells located in Ashenhurst Tract. The Ashenhurst Ranch Inc. well is located in section 22 (GWIC Id: 212086). This well is 480 feet deep and is completed in a sand formation 398 to 480 feet below ground surface and yields 8 gpm (<http://mbmaggwic.mtech.edu/sqlserver/v111/reports/SiteSummary.asp?gwicid=212086&agency=mbmg&session=480645&>). The second Ashenhurst Ranch Inc. well is located in

section 28 (GWIC Id: 212090). This well is 65 feet deep and is completed in a sand formation 46 to 65 feet below ground surface and yields 15 gpm (<http://mbmaggwic.mtech.edu/sqlserver/v11/reports/SiteSummary.asp?gwicid=212090&agency=mbmg&session=480649&>).

3.6.2 Surface Water

The lands within the Ashenhurst Tract are located within the Rosebud Creek 4th order watershed (HUC 10100001) and within the Richard and Lee Coulee 6th order watersheds (HUC 101000030506 and 101000030506, respectively). Surface water resources consist of ephemeral and intermittent drainages with runoff from rainfall or snowmelt events and springs (see Table 3.3 and Map 1.2). Lee, Richard, and Rape Coulees are located within the Ashenhurst Tract. These coulees drain toward the southeast into Rosebud Creek. Rosebud Creek joins the Yellowstone River near Rosebud, Montana. Richard and Rape Coulees have approximately 70 acres of 100-year floodplains located within the Ashenhurst Tract according to Natural Resource Conservation Service (NRCS) soil data. The United States Geological Survey (USGS) 1:24,000 quad map for this area shows one spring which flows into Richard Coulee about 100 yards upstream of T 1 N, R 40 E, section 34.

Table 3.3 Stream Miles within Ashenhurst Area

Name	Approximate Miles
Lee Coulee	1.6
Rape Coulee	1.8
Richard Coulee	0.7
Unnamed	6.9

(NHD 2009)

Some runoff is captured in private stock water ponds. The length of time these ponds contain water is dependent upon the drainage area above the pond, precipitation amounts, and how individual ponds are constructed. Many stock water ponds in the area do not contain water during portions of drier years (DOI-BLM-MT-020-2009-0013).

Surface water flow in the upper reaches of ephemeral drainages in the area is mainly a result of major snowmelt or runoff events, with the majority of precipitation coming in April, May, and June (<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mt4701>). Runoff from rainfall or snowmelt events is usually of short duration and high quality. This results in low total dissolved solids (TDS) concentrations. In Rosebud Creek, flow is nearly continuous resulting in higher TDS due to groundwater derived baseflow. High flows typically occur March to June. Annual runoff averages 4,460 ac-ft as measured at the reservation boundary near Kirby, MT (<http://wdr.water.usgs.gov/wy2009/pdfs/06295113.2009.pdf>).

The MDEQ has not listed Lee, Richard, and Rape Coulees as impaired streams on the 2008 303(d) impaired stream list. The portion of Rosebud Creek which receives runoff from the

Ashenhurst Area (from the Northern Cheyenne Reservation Boundary to an irrigation dam 3.8 miles above the mouth (MT42A001_012)) is listed as Category 5 and a Total Maximum Daily Load (TMDL) is required but not completed. Warm Water Fishery beneficial use is listed as partially supporting with Aquatic Life and Primary Contact Recreation uses not assessed. The source of impairment is identified as Dam Construction (http://cwaic.mt.gov/det_rep.aspx?segId=MT42A001_012&qryId=73252)

No wetland areas are delineated within the Ashenhurst Tract by the National Wetland Index (<http://nris.mt.gov/gis/gisdata/lib/gisDataList.aspx?datagroup=statewide-regional&searchTerms=nwi>).

The coal tracts owned by Nance-Brown are located in the alluvial valley along the Tongue River. The State of Montana issued an AVF determination and a Declaratory Ruling on May 19, 1986, that certain coal lands near the Tongue River in Rosebud County, Montana, cannot be mined using surface mining methods.

3.7 LANDS AND REALTY

The federal coal tracts in the Ashenhurst Area being considered for exchange are split-estate lands where one entity owns the surface and a different entity owns the minerals. The surface lands over the federal coal tracts are privately owned; no BLM surface overlies the federal coal tracts. The Ashenhurst Tract involves two separate owners over the federal coal tracts: Ashenhurst Ranch Corporation and Big Sky Coal Company. The Big Sky Coal Company is the surface owner for T. 1 S., R. 41 E., Section 6 and the Ashenhurst Ranch Corporation is the surface owner of the remaining four sections of the Ashenhurst tracts. Map 3.2 shows privately owned surface and federally owned coal in the Ashenhurst Area.

Other minerals in the non-federal coal tracts in the Ashenhurst Area are also privately owned. It is unknown if the oil and gas is leased on these lands. Of the federal coal lands, there are 624.21 acres where all minerals are federal and are under BLM administration, in T. 1 N., R. 40 E., Section 26, N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ and T. 1 S., R. 41 E., Section 6, Lots 3, 4, 5, 6, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$. No federal oil and gas leases are recorded for these lands. Western Energy Company holds coal exploration licenses MTM-98618 (T1N, R40E, Section 22) and MTM-99242 (T1N, R40E, Sections 26, 28, 34, and T1S, R41E, Section 6) on the subject federal coal lands.

3.7.1 Split Estate

Ashenhurst Tract

SMCRA and the implementing regulations, including 43 CFR subpart 3427, set out the protections that shall be afforded to qualified surface owners of split estate lands, as defined in 43 CFR 3400.0-5(kk). Specifically, SMCRA requires the submission of evidence of written surface owner consent from qualified surface owners of split estate lands when surface mineable Federal coal is considered for lease. 30 U.S.C. § 714(c).

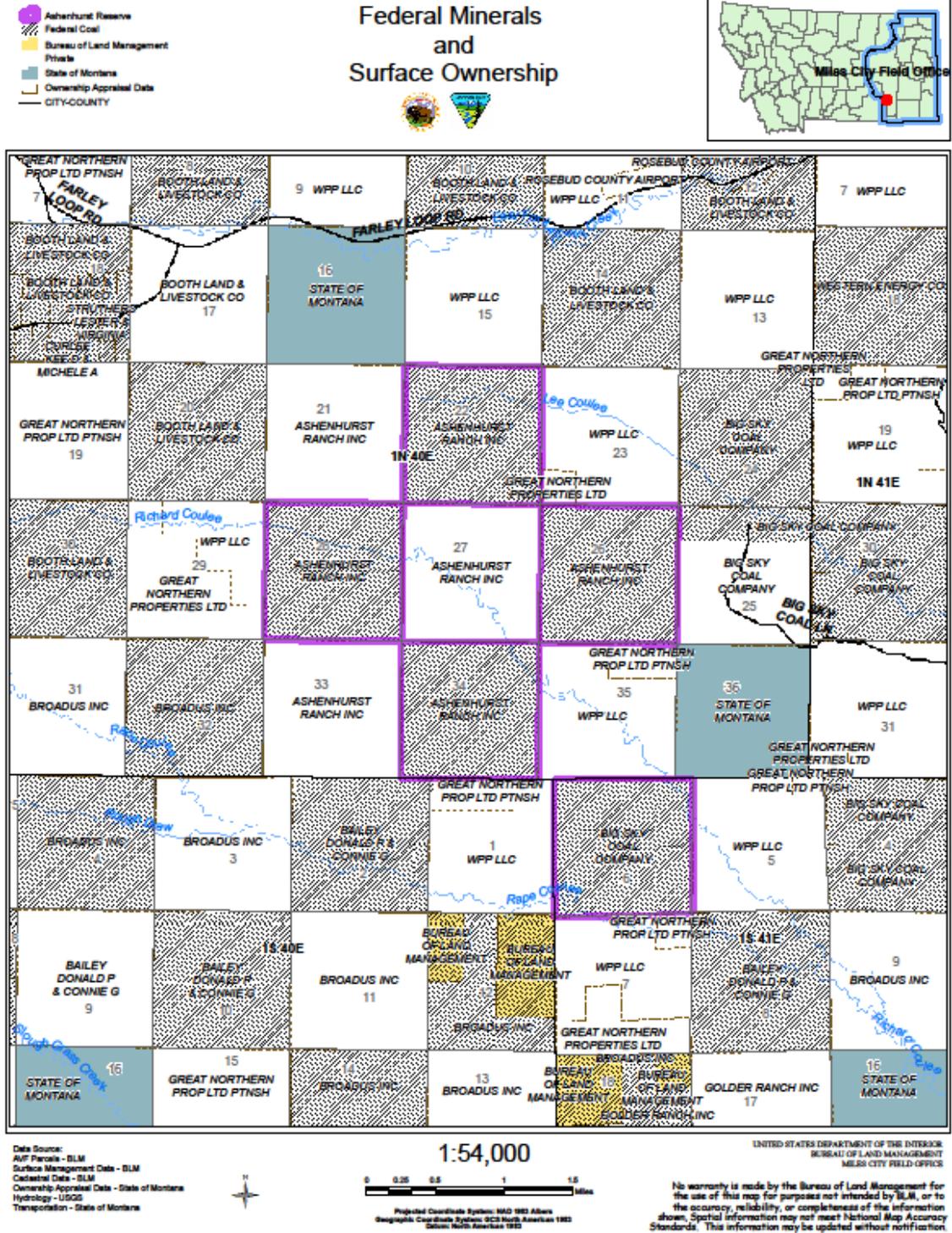
However, if the federal coal estate is transferred to a private owner through exchange, a qualified surface owner may not have the same protection under Montana State law. See MONT. ADMIN. R. 17.24.303(1)(o)(i). If the surface owners are qualified as described by SMCRA and the regulations, the loss of the ability to refuse to consent to a federal lease of the coal may impact the value of the surface. Map 3.2 identifies the split estate for privately owned surface and federally owned subsurface within and around the Ashenhurst Tract.

Nance-Brown Tract

The Nance-Brown Tracts are located along the Tongue River valley. Within the tracts are 3,379.55 acres of privately owned coal eligible for exchange, underlying Nance-Brown's privately owned surface. The Nance-Brown Tracts are located from Birney, Montana to approximately 12 miles north along the Tongue River (Map 1.3).

The Nance-Brown Tracts consist of agricultural land, cottonwood galleries, with hardwood understory along the Tongue River. Livestock grazing and irrigated agricultural land is the predominate use on the Nance-Brown Tract.

Map 3.2 Federal Minerals and Surface Ownership



3.8 LIVESTOCK GRAZING

Livestock grazing is the principal economic use of land within the Ashenhurst Area. Cattle are the predominant domestic grazing animals on the Ashenhurst Tract. Due to the lack of BLM surface ownership within the area there is no associated BLM grazing administration.

3.9 RECREATION

The surface lands in the Ashenhurst Area are privately owned. Surface owners have the authority to grant or deny recreational use of their lands as well as control access across and on lands they own. The main recreational use of the lands is hunting. The primary big game species found throughout the area include mule deer, elk and pronghorn antelope. Sharp-tailed grouse is the most abundant game bird in the Ashenhurst Area followed by the wild turkey.

3.10 SOCIAL AND ECONOMIC CONDITIONS

The 2000 population of Rosebud County was 9,383, a decrease of 10.7 percent since 1990. In 1983 the population of Rosebud County peaked at 14,000 with the construction of Colstrip generating units 3 and 4. Since then, many power plant construction workers, other temporary workers, and the families of these workers have moved away. The population of the Northern Cheyenne Reservation and off-reservation trust land grew 14 percent between 1990 and 2000 and showed a similar peak during the mid-1980s. The Indian population on the Reservation increased 14 percent during the 1990s while the non-Indian population on the Reservation increased by 16 percent during this time period.

The economy of Rosebud County is based upon its abundant natural resources. These resources include the land, which is used for crops and livestock production; coal, which is mined and converted to electricity; and the water and wildlife that offers outdoor recreation opportunities. The economic activity generated by the production, extraction, or utilization of these natural resources provides income and employment.

Energy related developments have shifted the economic base of Rosebud County from agriculture to industrial. Industrial facilities in the area include the Rosebud Mine, Colstrip units 1 - 4 power generating station, and Montana Generation Rosebud Synfuel power plant which burns waste coal to generate electricity.

The Rosebud Mine is expected to continue to operate. The mine produced 10.33 million tons and employed 372 people with a payroll of 26.5 million dollars in 2009 according to the Montana Coal Council. The mining industry has accounted for between 8 and 9 percent of total employment in Rosebud County since 2000. The mine will need to acquire additional coal reserves to supply the mine-mouth Colstrip plants. The reserves in the Ashenhurst Area to the south of Mine Area C South include 217.7 million tons in a checkerboard of unleased federal, state and private fee coal. The average statewide Free on Board (FOB) mine price of coal in Montana was \$12.31 per ton in 2008 according to the

Energy Information Administration. The federal royalty rate is 12.5% of the mine price, or \$1.54 per ton in 2008.

3.10.1 Environmental Justice

(All data is based on the 2000 Census)

The Ashenhurst Area is located within Rosebud County. Rosebud County includes the Northern Cheyenne Indian Reservation with a substantial Native American population. The 2000 population of Rosebud County was 9,383. Slightly over 30% of Rosebud County is Native American. In 2000, over 4,000 Native Americans lived on the Northern Cheyenne Reservation. The Ashenhurst Area is not located within the Northern Cheyenne Indian Reservation, but is approximately 12 miles north of the Reservation.

3.11 SOILS

Soils within the Ashenhurst Tract developed in alluvium, colluvium, and residuum derived from the Tongue River Member of the Tertiary Fort Union Formation. Lithology consists of “soft interbedded light yellow to yellowish-gray lenticular sandstones, yellowish-gray siltstone, gray claystone and shale, thin, dark carbonaceous shale, coal seams, and clinker beds” (Veseth and Montagne 1980). An erosion resistant cap of clinker or sandstone is exposed on higher ridges and hills. Terrain is gentle, consisting of sedimentary plains, hills, ridges, alluvial fans, and terraces. Slopes are generally less than 15 percent, though slopes range up to 65 percent. Elevation ranges from approximately 3,200 to 3,700 feet.

Soils are commonly deep (greater than 80 inches), with loam surface textures, but may also be channery loam, silt loam, and fine sandy loam. Soils are generally productive with an approximate range of 700 to 2000 lbs/ac (air-dry), depending on texture, slope, and other characteristics. There are no sodium salts present in large enough amounts to effect plant growth and productivity. The principal ecological sites are silty, silty-steep, and sandy with 10-14 inches of annual precipitation. The reclamation potential is favorable on approximately 60 percent of the area (1,800 acres). Areas poorly suited to reclamation generally are highly susceptible to water erosion.

Principal soil series (see Table 3.6 for map units) within the Ashenhurst Tract include (NRCS 2009):

- The Birney series consists of very deep, well drained soils that formed in colluvium or alluvium derived from semiconsolidated interbedded sandstone and hard shale. These soils are on sedimentary plains, hills, stream terraces, escarpments, and alluvial fans.
- The Busby series consists of very deep, sandy, well-drained soils that formed in alluvium, eolian material, or residuum derived from semiconsolidated sandstone. These soils are on stream terraces, alluvial fans, sedimentary plains, and hills.

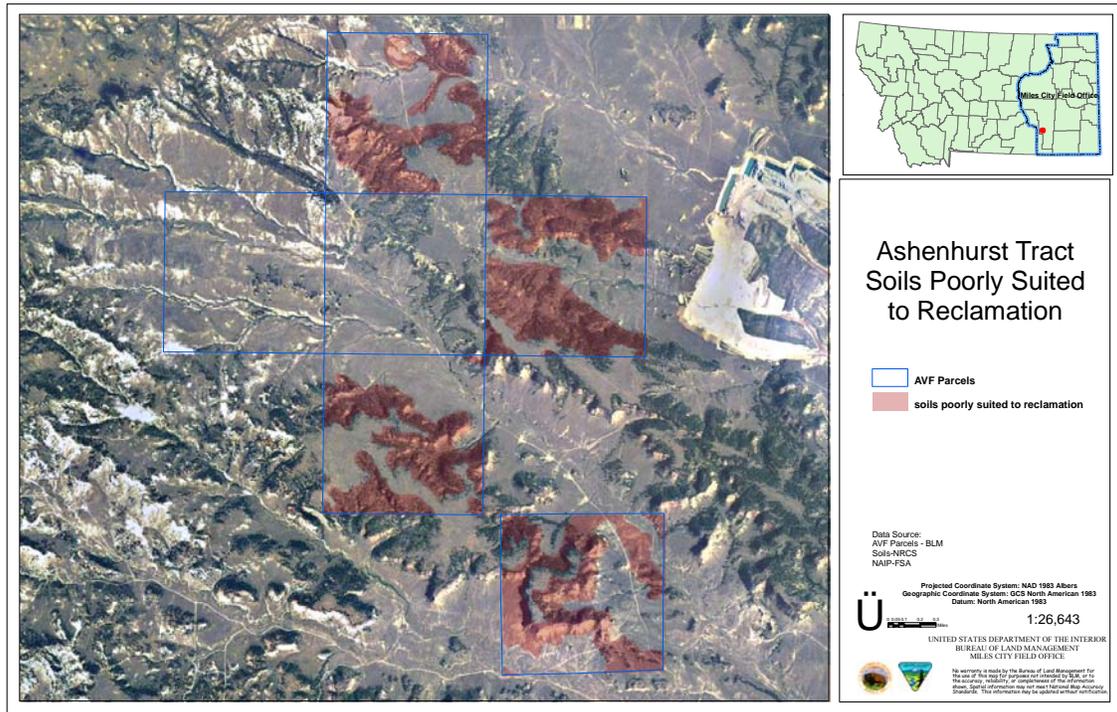
- The Cabbart series consists of shallow, well-drained soils that formed in material derived from semiconsolidated loamy sedimentary beds at depths of 10 to 20 inches. These soils are on hills, ridges, escarpments, and sedimentary plains.
- The Delpoint series consists of moderately deep, loamy, well-drained soils that formed in alluvium, colluvium, or residuum derived from semiconsolidated loamy sedimentary beds or in till over the sedimentary beds. These soils are on sedimentary plains, hills, ridges, strath terraces, or escarpments.
- The Lonna series consists of very deep, loamy, well-drained soils that formed in alluvium derived from semiconsolidated loamy sedimentary beds. These soils are on alluvial fans, stream terraces, sedimentary plains, drainageways, and hills.
- The Yamac series consists of very deep, loamy, well-drained soils that formed in alluvium from soft sedimentary uplands. These soils are on sedimentary fans, terraces, and footslopes (Veseth and Montagne 1980).

*Table 3.4: Principal Map Units within the Ashenhurst Tract**

Map Unit	Acres	Percent
Birney, moist-Armells-Cabbart complex, 25 to 70 percent slopes	588	18
Cabbart-Rock outcrop-Yawdim complex, 15 to 70 percent slopes	212	7
Yamac loam, 2 to 8 percent slopes	204	6
Lonna-Cambeth silt loams, 2 to 8 percent slopes	195	6
Busby-Twilight-Blackhall, warm, fine sandy loams, 2 to 8 percent slopes	194	6
Yamac-Delpoint loams, 4 to 15 percent slopes	170	5

*BLM GIS analysis (NRCS 2010)

Map 3.3 showing areas poorly suited to reclamation



3.12 SOLID OR HAZARDOUS WASTES

Both parties to the land exchange have indicated in the Agreement to Initiate an AVF Fee Coal Exchange that to the best of their knowledge, no known or suspected release, storage or disposal of hazardous substances has occurred on the surface over the federal or non-federal coal lands involved in the proposed exchange. Only coal would be exchanged and no surface would be exchanged. The Environmental Site Assessments completed on the subject coal lands indicated no evidence of hazardous substances, petroleum products, or any other environmental conditions were evident on the property to be exchanged.

3.13 TOPOGRAPHY AND PHYSIOGRAPHY

The Ashenhurst Area is geographically near the western edge of the Great Plains province. This province can be characterized as a plateau-like area that is interrupted in the western portion by mountainous uplifts separated from one another by structural basins, one of which is the Powder River Basin. The Ashenhurst Area are located near the northwest limb of the structural basin lying in the Rosebud Creek Valley.

The Powder River Basin is a large structural depression that is bounded on the west by the Bighorn Mountains and Wolf Mountains, on the east by the Black Hills Uplift, and on the south by the Laramie Mountains, the Casper Arches and Hartville Uplift. The basin extends

northward in Montana where it is separated from the Williston Basin by the Miles City Arch (Glass, 1976).

A more site specific topographical description of the Ashenhurst Area would be rolling hills with grassy meadows and distinct ridges that make up the foot hills of the Little Wolf Mountains. Moving from north to south the land formations transition into a much more aggressive landscape comprised of steep and rugged ridges that lead down into valleys. Lee, Richard, and Rape coulees are the main valleys located within the Ashenhurst Tract. These coulees drain toward the southeast into Rosebud Creek. Rosebud Creek joins the Yellowstone River near Rosebud, Montana.

3.14 VEGETATION

Numerous ecological sites are found within the Ashenhurst Area but the primary ones include the following: Silty (Si), Shallow (Sw), Silty-steep (SiStp), Sandy (Sy), Shallow Clay (SwC) and Very Shallow (VSw). The total dry-weight production expected to be found on these sites during a normal growing season ranges from approximately 800 to 1,500 lbs. /acre. Most of the vegetation found within the Ashenhurst Area is consistent with these ecological sites and for this part of Rosebud County.

The primary native grass species found within the area include both cool and warm season species such as: bluebunch wheatgrass (*Pseudoroegneria spicata*), little bluestem (*Schizachyrium scoparium*), green needlegrass (*Nassella viridula*), needle and thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), sideoats grama (*Bouteloua curtipendula*), plains muhly (*Muhlenbergia cuspidata*) and prairie sandreed (*Calamovilfa longifolia*).

Shrub and tree species found within the area include: Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), silver sagebrush (*Artemisia cana*), skunkbush sumac (*Rhus trilobata*), ponderosa pine (*Pinus ponderosa*), creeping juniper (*Juniperus horizontalis*) and Rocky Mountain juniper (*Juniperus scopulorum*).

A wide variety of perennial native forbs, grasslikes and half shrubs are also found within the area. These species include but are not limited to: winterfat (*Krascheninnikovia lanata*), threadleaf sedge (*Carex filifolia*) and prairie sagewort (*Artemisia frigida*).

No special status plant species are known to occur within the Ashenhurst Area. There have been several occurrences of Little Indian Breadroot (*Psoralea hypogaea*) documented in T1N, R41E. This perennial forb is classified as sensitive by the BLM and is found in loose, sandy soil below sandstone outcrops and in blowouts.

3.14.1 Invasive Species

The main noxious weed species of concern that has invaded and become established within this area is spotted knapweed (*Centaurea biebersteinii*). Canada thistle (*Cirsium arvense*) will also infest areas of disturbance. Private surface owners work with the County to

develop weed treatment plans. Due to the lack of BLM surface ownership within the area there is no associated BLM noxious weed treatment plan.

3.15 WILDLIFE AND AQUATIC WILDLIFE

3.15.1 Aquatic Wildlife

Although there is very limited aquatic wildlife habitat, there are intermittent water and pools. Prairie fish, amphibians, and reptiles are adapted to warm, highly conductive (e.g. water with high amounts of natural minerals), intermittent water-bodies. For example, there are 70 acres of 100 year floodplain (see Hydrology section) within the Ashenhurst Tract which likely are used seasonally or otherwise. In addition to the sensitive species that could or do occur, other fish species in the Ashenhurst Tract may include fathead minnows, sand shiner, white sucker, creek chub, lake chub, plains minnow, and non-native species including sunfish (e.g. green sunfish) and the plains killifish.

3.15.2 Terrestrial Wildlife

A diversity of wildlife habitat, topography, and vegetation types exists across the five sections comprising the Ashenhurst Tracts. This diversity provides habitat for many wildlife species in addition to those previously mentioned.

Utilizing Montana Fish, Wildlife and Park's (MTFWP) Crucial Area Planning System (CAPS) program, all of the Ashenhurst Tract rated a level 1 or 2 (scoring from 1 through 4) for Terrestrial Conservation Species and Terrestrial Species Richness. This rating was due to a diversity of habitats present, including coniferous forest habitat, coupled with large amounts of big sagebrush present. Models used in the CAPS program, indicate species richness would be high for these areas. Terrestrial Game Quality scores were ranged from 2 to 4, with three of the five sections receiving a 4, with scores of 3 and 4 for ones section each. In general, these ratings suggest, that winter range is not an important component of at least three of the sections in the Ashenhurst Tract. Riparian and wetland habitats were not scored or scored very low, indicating a lack of these habitats being present on the Ashenhurst Tract.

Wildlife species and habitat surveys have been conducted throughout the project area at various times and for various species. Coal companies such as Western Energy Company and the Peabody Coal Company have completed annual surveys for several years. Some areas have been surveyed since the mid1970s. In addition, BLM contracted with professional Wildlife Biologist to conduct additional wildlife surveys. This survey was conducted between April 12 and May 30, 2010. Emphasis was placed on inventorying for big game winter ranges, sage and sharp-tailed grouse leks, raptors/nests, black-tailed prairie dogs/obligates and mountain plovers. The entire area has not been comprehensively surveyed for all wildlife resources; however, past surveys provide insight into what species have been documented, and what other species are expected within those habitat types.

3.15.3 Big Game Species

The Ashenhurst Tract provides habitat for mule deer, elk and pronghorn (See map 3.4). These species or their signs were observed during the spring 2010 survey. Sections 6 and 28 of the Ashenhurst Tract have been previously identified as crucial mule deer winter range. A representative from Western Energy reported seeing a herd of pronghorns numbering about 100 in the early spring of 2010. The area is not been designated crucial pronghorn winter range.

Mule deer are likely the most abundant big game species utilizing these tracts on a year-round basis, generally preferring sagebrush, grassland, and conifer types (BLM 1984). Habitat diversity appears to be a good indicator of intensity of deer use. In mule deer habitats, greater vegetative diversity usually is directly impacted by topographic diversity, thus more rugged topography, supporting a greater diversity of vegetative species may be the ultimate factor influencing mule deer use of an area (Mackie et al, 1998). Habitat to support mule deer exists within all of the five sections.

Winter range is often part of year-round habitat in eastern Montana. Winter ranges are typically in areas of rougher topography and are often dominated by shrub species that provide crucial browse. Escape and thermal cover are also important for maintenance and survival. “dog-hair” stands of ponderosa pine and Rocky Mountain Juniper are examples of important escapes and thermal cover used by mule deer in the project area.

Whitetail deer have not been observed during Big Sky Mine’s wildlife monitoring efforts since 1991. This area includes four of the five sections comprising the Ashenhurst Tract. The one remaining section (Section 28) is similar to the remaining four sections, suggesting whitetail deer would be unlikely to occupy this section as well.

Pronghorn are widely distributed across the Ashenhurst Tract. They are generally associated with more gently sloping grasslands and shrublands.

Rocky Mountain elk are most closely associated with ponderosa pine and Rocky Mountain Juniper woodlands. No elk have been observed on the Big Sky Mine’s wildlife monitoring transects since 1991. However, elk signs were observed in the 2010 BLM wildlife survey. Elk are known to make extensive use of the grasslands and shrublands adjacent to the conifer habitats. The species may be either infrequent or common within these habitat types in the project area. Elk parturition areas and winter ranges have not been delineated.

The potential for big game movements or migrations through the project area is not fully known. It is reasonable to assume big game movements occur at least seasonally. Migration corridors have not been identified through the Ashenhurst Tract area.

3.15.4 Upland Game Birds

The project area has the potential to provide habitat for greater sage and sharp-tailed grouse, Merriam's wild turkeys and mourning doves (See map 3.5).

Greater sage-grouse (sage-grouse) are a native prairie grouse species, considered sagebrush obligates. In addition to sagebrush grasslands, sage-grouse may also use mesic areas during brood rearing or during the summer/late summer season for habitat.

Marginal sage-grouse habitat may exist on some parts of the tracts; however, sage-grouse leks are not known to occur on or adjacent to any of the sections comprising the project area. In addition, extensive inventories conducted in the 2010 BLM wildlife survey and the Big Sky Mine yielded no suggestion of sage-grouse occupying any of the potential habitat on the Ashenhurst Tract.

Sharp-tailed grouse are yearlong residents and may be found on the Ashenhurst Tract and adjacent lands. Three historic sharp-tailed grouse dancing locations are located within Section 28 and six additional dancing grounds are located within one mile of the five tracts. None of the locations in Section 28 were active in 2010. Sharp-tailed grouse generally prefer hardwood draws, riparian areas, and prairie grasslands intermixed with shrubs such as chokecherry and buffaloberry. Recent surveys for sharp-tailed grouse leks within the project area yielded no dancing grounds (leks). However, three sharp-tailed grouse were observed in Section 28., suggesting a lek may be present. The presence of coyotes in close proximity to grouse could influence lekking behavior. . Subsequent surveys did not indicate the presence of lekking sharp-tailed grouse. Steep topography and presence of conifer habitat limited the likelihood of the presence of leks. Six sharp-tailed grouse leks have been identified as being within one mile of any of the five sections. Activity level varies from inactive to active.

The Merriam's wild turkey is not native to Montana, being introduced into eastern Montana in the 1950's. Habitat for the Merriam's wild turkeys is present in the project area, with Big Sky Mine observing wild turkeys within section 26. The forested habitat and in particular mature ponderosa pine are key habitat components. Due to cold winters, potential for abundant snow cover and lack of available food, most wild turkeys are dependent on winter cattle feeding operations or cereal grains in order to survive the winter months.

Mourning doves nest throughout eastern Montana, including the project area. Mourning doves migrate south, normally in early September. Nests can be found in any substrate, including trees, shrubs, ground, rock outcrops, etc. No surveys other than Breeding Bird Surveys are geared toward collecting information specific to this species.

3.15.5 Raptors

Raptor species have been observed on or adjacent to the tracts. A total of seven raptor species (red-tailed hawk, Merlin, prairie falcon, golden eagle, great horned owl, northern

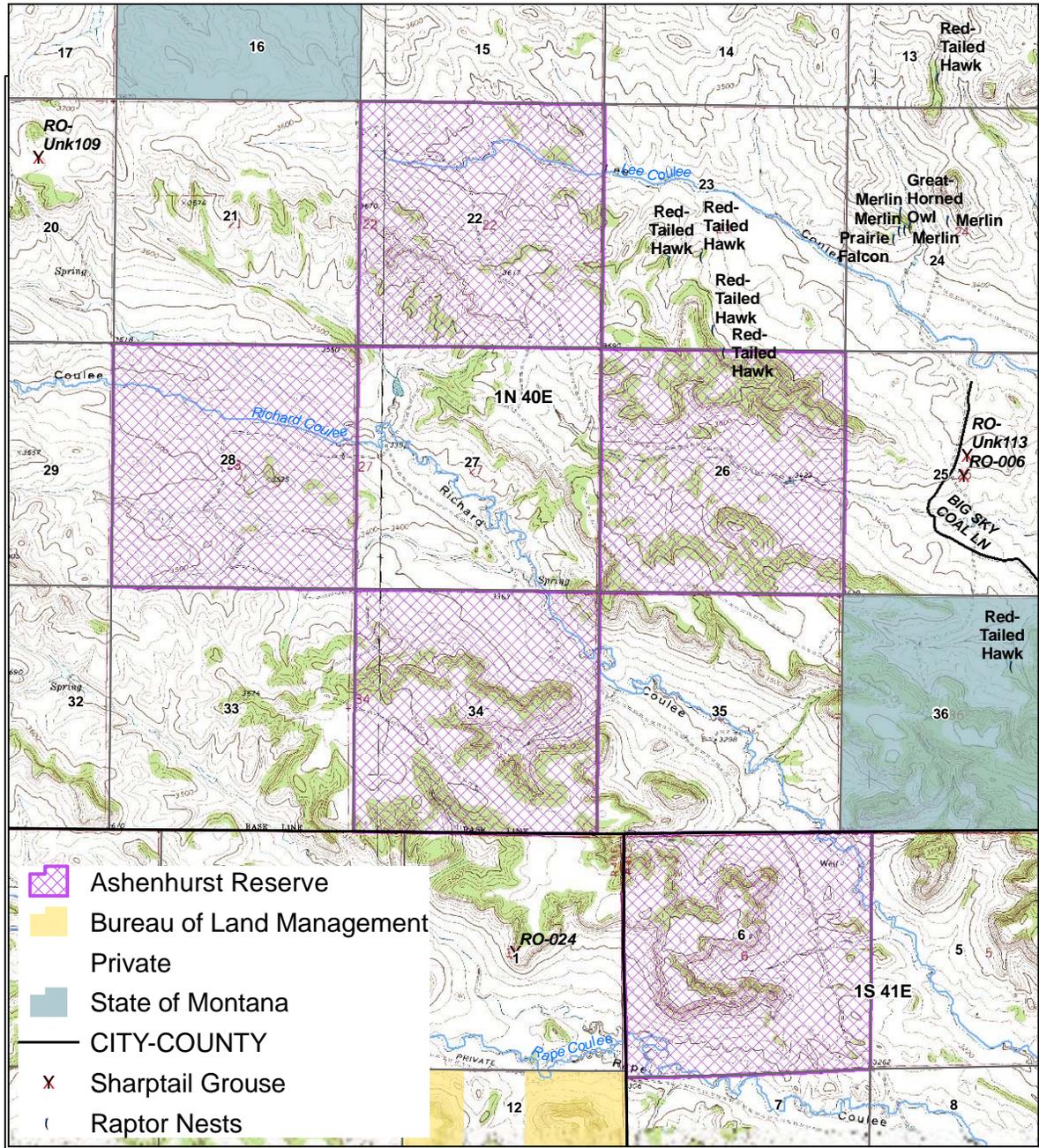
harrier and American Kestrel) have been identified as nesting or observed within or adjacent to the proposed tracts. The area in the general vicinity of the tracts contains several raptor nests with the largest concentration of nesting activity in the area is associated with the rough breaks country and upland areas where trees are established. One intact golden eagle and one red-tailed hawk nest are located within the potential area of disturbance. The Ashenhurst Tract area provides nesting, foraging, and migratory habitat for a wide array of raptor species (See map 3.3). Other species that may utilize the project area in less abundance include bald eagles, sharp-shinned hawks, Cooper's hawks, Ferruginous hawks, Swainson's hawks, burrowing owls, prairie falcons, and Merlins. Peregrine falcons are suspected of migrating through the project area.

Surveys were completed for existing and new raptor nests in the spring, 2010. A limited number of rock outcrops and cliffs (located in Section 6) were noted as potential nest sites. An inactive nest located in a mature cottonwood tree in Section 28 (SW1/4NW1/4NW1/4) was identified. An additional destroyed red-tailed hawk nest was located in the NE1/4NW1/4 of section 26 and an active golden eagle nest has been identified in a ponderosa pine, located in the NW1/4NE1/4 of section 6. Raptors including northern harriers, red-tailed hawks, American kestrel and a golden eagle were observed flying or perched during the 2010 inventory.

Map 3.5 Avian Species



Avian Species



Data Source:
 A/F Parcels - BLM
 Surface Management Data - BLM
 Cadastral Data - BLM
 Hydrology - USGS
 Transportation - State of Montana



1:33,500



Projected Coordinate System: NAD 1983 Albers
 Geographic Coordinate System: GCS North American 1983
 Datum: North American 1983

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 BUREAU OF LAND MANAGEMENT
 MILES CITY FIELD OFFICE

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3.15.6 Migratory Bird Species

A few raptor surveys have been conducted across the Ashenhurst Tract area, but no other bird surveys have been conducted across the area. Numerous surveys and observations have been made in similar habitat types throughout eastern Montana. Surveys have been conducted by the United States Geological Survey, University of Montana Avian Science Center, Rocky Mountain Bird Observatory, The Montana Natural Heritage Program, and other interested “birders”.

3.16 SPECIAL STATUS WILDLIFE AND AQUATIC WILDLIFE

3.16.1 Aquatic Wildlife

There are no special status aquatic animal species within the Ashenhurst Tract area, but there are sensitive species (see Appendix C) downstream of the Ashenhurst tract Richard, Rape, Lee, Ernie, and Miller Coulees enter Rosebud Creek. Rosebud Creek is spawning and rearing habitat for Sauger (*Sander Canadensis*). Depending on water quantity and season Richard, Rape, Lee, Ernie, and Miller Coulees may be intermittent habitat for Great Plains Toad, Northern Leopard Frog, Plains Spadefoot, and the Snapping Turtle. Rosebud Creek is likely habitat for some or all of these species year-round.

3.16.2 Terrestrial Wildlife

The Ashenhurst Tract area includes a wide variety of wildlife habitat consistent with the northern Great Plains. The Ashenhurst Tract is located within sagebrush-grasslands, ponderosa pine and juniper woodlands, short and mixed grass prairies, and others. A portion of the area is characterized by a silver/big sagebrush-grasslands vegetation type. The remaining portion of the area is populated by ponderosa pine and Rocky Mountain juniper, with a shrub understory consisting of silver sagebrush and skunkbush sumac.

Some of these areas provide habitat for wildlife species considered “BLM sensitive” based on the Montana/Dakota’s sensitive species list (2009), or given the status of “federally threatened, endangered, or proposed” by the United States Fish and Wildlife Service (USFWS). Appendix C represent this list of species. In addition, the USFWS’s Birds of Conservation Concern are also noted. Appendix C identified whether these species will be identified within the project area.

3.16.3 Threatened, Endangered, and Proposed species

No threatened or endangered species/habitats are found on any of the tracts.

The greater sage-grouse occupies sagebrush-grassland habitats throughout southeastern Montana. Generally, sage-grouse are non-migratory in southeastern Montana. Sage-grouse rely on large expanses gently rolling big sagebrush (*Artemisia tridentata*) habitats, devoid of trees or tall anthropogenic structures and “connected” to other suitable habitat. Although, both big and silver sagebrush is common on each of the tracts, the presence of

conifers, coupled with the rugged terrain and lack of connectivity would suggest the project area may not support sage-grouse.

3.16.4 Other sensitive species

As illustrated in Appendix C, up to 34 wildlife species considered as BLM “sensitive” have the potential to occur within the project area. These include 4 mammals, 24 birds, 3 amphibians, and 3 reptiles. This list is based on past observations. In some instances, historic observations are the only known record. If a species is noted as in range, it signifies habitat within the tracts would be considered appropriate for species occupation during some phase of its lifecycle. This might be only for a short time frame, during migrations, seasonally, or possibly year round. Documentation and coverage of occupation of habitat by specific wildlife species is considered good across this area for some species and for other species lacking (small mammals, reptiles, amphibians, herptiles, raptors, etc.) However, the table documents the potential for wildlife species occurrence if at least one of the five sections is located within a particular sensitive species known range of habitat occupation based on available science and research.

3.16.5 Prairie Dogs and Associated Species

No black-tailed prairie dog activity or sign was observed throughout the project area. Black-tailed prairie dog habitat, characterized by gently sloping terrain, devoid of trees exists in several areas within the project area.

3.16.6 Mountain Plovers

No mountain plovers were observed during the 2010 survey. Topography for the most part is sloping and well vegetated with somewhat dense sagebrush stands and forested areas. Preferred and typical mountain plover habitat of larger expanses of flat to very gently sloping (less than 5%) and very little to short sparse vegetation is limited, strongly suggests this area is not mountain plover habitat.

Chapter 4

ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

This chapter presents the potential environmental, social and economic effects from the actions described in each Alternative in Chapter 2 as well as potential effects from the Reasonably Foreseeable Development (RFD) Scenario and potential cumulative effects from each Alternative in combination with other relevant activities presented in Section 2.5. This chapter is organized first by alternative and then resource in the same sequence they were discussed in Chapter 3.

4.0.1 Assumptions and Reasonably Foreseeable Development Scenario Summary

The action of exchanging the ownership (title) of the unleased Federal coal for the AVF fee coal would neither result in the issuance of any coal leases nor authorize any coal mining or related activities. Even if the coal exchange is approved, it remains unknown whether any coal development would actually occur in the Ashenhurst Area.

Alternative A Assumptions:

- The proposed coal exchange between Nance-Brown (fee coal tracts) and the BLM (federal coal tracts) would be approved.
- The approved exchange would include some or all of the currently unleased federal coal tracts in the Ashenhurst Area as necessary to equalize the agreed upon value of the non-federal coal in the Nance-Brown tracts.
- Any unleased federal coal in the Ashenhurst Tract area not included in the exchange could be considered for future leasing.
- The non-federal coal tracts in the Ashenhurst Area could be leased or sold and developed (see Map 3.2). The non-federal coal tracts include those that would be acquired by Nance-Brown through approval of the exchange and also non-federal coal tracts not part of the proposed exchange in the Ashenhurst Area.
- The Nance-Brown AVF coal tracts acquired by the United States will not be leased or mined because of the prohibition under SMCRA Section 510(b)(5).
- The non-Federal and Federal (if any) coal in the Ashenhurst Tract area could be surfaced mined as an extension of the adjacent Rosebud Mine under an approved Mining permit from the MDEQ.
- BLM stipulations would not be applied to non-federal coal.

Alternative B Assumptions:

- The proposed coal exchange between Nance-Brown and the BLM would not be approved.
- The federal coal tracts in the Ashenhurst Area could potentially be considered for leasing.
- The non-federal coal tracts in the Ashenhurst Tract area could potentially be leased or sold and developed. The non-federal coal tracts include those that would be acquired by Nance-Brown through approval of the exchange and also non-federal coal tracts not part of the proposed exchange in the Ashenhurst Area.
- The Nance-Brown AVF coal tracts will not be mined.
- The federal and non-federal coal in the Ashenhurst Area could be surface mined under an approved mine permit from the MDEQ.
- BLM stipulations could be applied to federal coal in the Ashenhurst Area.

Reasonably Foreseeable Development Scenario

Appendix A presents a reasonably foreseeable development (RFD) scenario that describes potential coal mining in the area that includes the Ashenhurst Area. The difference between the Alternatives would be the acres of federal coal available for leasing would be fewer in Alternative A if the exchange is approved. A site specific environmental analysis would be prepared by BLM as part of the processing of any federal lease application. For the purpose of identifying possible environmental effects, BLM prepared a surface mining scenario (RFD) in which the Ashenhurst Area would be mined as an extension of the adjacent Rosebud Mine. A detailed environmental analysis would be conducted by MDEQ after receipt of a complete mine permit application. If federal coal was included in the mine permit application, BLM and OSM would also have to comply with NEPA.

4.1 EFFECTS OF ALTERNATIVE A – PROPOSED EXCHANGE ALTERNATIVE

4.1.1 Air Quality

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to air quality. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

Potential impacts to air quality from the coal being developed on the Ashenhurst Area could include increased airborne soil particles blown from pit development or roads; exhaust emissions from equipment, and vehicles; as well as potential releases of GHGs and volatile organic compounds during construction or production activities. The amount of increased emissions cannot be precisely quantified at this time because it is not known with any degree of certainty how much area a coal mine would cover, the types of equipment needed, or what technologies may be employed by a given company for developing a coal

mine. The degree of impact would also vary according to the characteristics of the geologic formations from which production occurs, as well as the scope of specific activities proposed in the coal lease. Assuming coal development in the Ashenhurst Area, additional environmental analyses will be completed during the mine permitting process. A detailed environmental analysis would be conducted by MDEQ after receipt of a complete mine permit application. If federal coal was included in the mine permit application, BLM and OSM would also have to comply with NEPA.

Current monitoring data show that the criteria pollutants fall well below applicable air quality standards indicating very good air quality. The potential level of development is expected to maintain this level of air quality by limiting emissions. In addition, pollutants would be regulated through the use of state-issued air quality permits or air quality registration processes developed to maintain air quality below applicable standards.

Cumulative Effects: No additional impacts to the air quality of the area would occur if the proposed Nance-Brown coal exchange does occur. BLM would need to take into account the impacts of previous coal development and other relevant activities when analyzing future coal projects involving federal coal and design projects to reduce impacts and/or develop appropriate mitigation strategies.

4.1.2 Climate Change:

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to climate change. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

The assessment of GHG emissions and climate change is in its formative phase. As summarized in the Climate Change Supplementary Information Report (SIR), climate change impacts can be predicted with much more certainty over global or continental scales. Existing models have difficulty reliably simulating and attributing observed temperature changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to external forcings (such as contributions from local activities to GHGs). Uncertainties in local forcings and feedbacks also make it difficult to estimate the contribution of GHG increases to observed small-scale temperature changes (Climate Change SIR 2010). It is currently not possible to know with reasonable certainty the net impacts from developing the Ashenhurst Area on climate. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the BLM's ability to quantify potential future impacts of decisions made at this level. It is therefore beyond the scope of existing science to relate a specific source of greenhouse gas emission or sequestration with the creation or mitigation of any specific climate-related environmental effects. Although the effects of greenhouse gas emissions in the global aggregate are well-documented, it is currently

impossible to determine what specific effect GHG emissions resulting from a particular activity might have on the environment.

While it is not possible to predict effects on climate change of potential GHG emissions discussed above in the event of coal development for alternatives considered in this EA, the act of exchanging federal coal does not produce any GHG emissions in and of itself. Releases of GHGs would occur at the exploration/development stage from such activities as vehicles and equipment and the release of any methane found in exposed coal seams (which BLM predicts would be low based upon well drilling data) and would be analyzed further in a separate environmental document before development occurs.

Cumulative Effects: No additional impacts to climate change would occur under this Alternative. BLM would need to take into account the impacts of previous coal development and other relevant activities when analyzing future coal projects involving federal coal and design projects to reduce impacts and/or develop appropriate mitigation strategies.

4.1.3 Cultural Resources

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership may result in impacts to cultural resources. Cultural resources that are located on private surface are owned by that private surface owner. The following analysis assumes the coal in the Ashenurst Area would be mined as described in the RFD (Appendix A) Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

Cultural resource sites recommended by BLM as eligible for listing on the National Register of Historic Places (NHRP) are present in the Ashenurst Tract area; however, the underlying Federal coal would be available for exchange or lease and development. Unsuitability criteria applied to Federal coal leasing, 43 CFR 3465.5.g.1 (Unsuitability Criteria 7), requires cultural properties to be listed on the NHRP. No sites in the Ashenurst Tract or the RFD area have been listed on the NHRP. Portions of the proposed exchange tracts, containing sites BLM recommended as eligible for listing on the NHRP, could require future lease stipulations and mitigative measures to avoid cultural resources. The stipulations and mitigation would be used to preserve information value and integrity of cultural properties, but would be initiated only if such requirements are set forth by the authority of MDEQ or OSM at the mine permitting stage.

Effects from direct surface disturbance associated with coal development activities described in the Ashenurst RFD (Appendix A) have the potential to alter the characteristics of significant cultural or historic properties by diminishing the integrity of any property's location, design, setting, materials, workmanship, feeling, or association. Alterations to visual, atmospheric, and auditory elements that would occur from surface disturbing activities would indirectly impact NHRP eligible properties by diminishing site setting, integrity, and landscapes. The use of future lease stipulations and mitigative

measures protects vulnerable, significant cultural resource values impacted by coal mining in the Ashenhurst Tract area.

4.1.4 Native American Concerns

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to traditional cultural values to the Crow and Northern Cheyenne Tribes. The following analysis assumes the coal resource would be mined in the future. Specific as to how and when would be purely speculative. Therefore, this analysis will focus on a general description of the impacts of mining these tracts.

Federal acquisition of the Nance-Brown Tracts in the Tongue River Valley would ensure that portions of the proposed Tongue River Traditional Cultural Properties District (McCormick et al. 2006) would not be impacted by coal development.

Both the Crow and Northern Cheyenne Tribes in previous coal leasing projects in the Colstrip area have told BLM, they believe that additional coal mining would further disrupt the spiritual environment, destroy cultural resources and endanger wildlife habitats (Kooistra-Manning et al. 1993:81). Provisions of Executive Order 13007 would not apply since there is no Federal surface involved and BLM does not control access to Federal coal in the Ashenhurst Tracts.

4.1.5 Indian Trust Assets

Direct and Indirect Effects to Indian Trust Assets: Under this Alternative, any coal acquired by the United States of America within the Northern Cheyenne Indian Reservation would be transferred to the Bureau of Indian Affairs (BIA) in Trust for the Northern Cheyenne Tribe.

Cumulative Effects: No impacts would occur to Indian Trust Assets if the proposed Nance-Brown coal exchange does occur. BLM would need to take into account traditional cultural values in approving any future coal related developments on leased federal coal.

4.1.6 Paleontological Resources

Direct and Indirect Effects to Paleontological Resources: Since no paleontological resources were identified in the Ashenhurst Tracts, there would be no direct or indirect effects to paleontological resources under this Alternative. The Ashenhurst Area is an area with low potential to contain significant paleontological resources.

Cumulative Effects: Effects to cultural resources could occur from direct surface disturbances associated with coal development activities. The remaining underlying Federal coal if any will still be eligible for leasing, requiring the BLM to take into account the effects of coal development on cultural resources. Standard and special cultural resource stipulations that protect cultural resources will be applied to all lease applications.

Project plans, if required by MDEQ would be developed to minimize impacts to cultural properties recommended as eligible for the NRHP.

4.1.7 Geology and Minerals

Direct and Indirect Effects to Coal: Under this Alternative, the exchange of coal ownership would not result in impacts to geology and minerals. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, if mining was to occur in the area, the result would be an irreversible and irretrievable loss of the coal resource.

Direct and Indirect Effects to Oil and Gas: Potential mining of the coal would not affect the potential production of CBNG because any gas that may have been present in the coal bed would probably have escaped to the atmosphere at the outcrops and the coal is at such a shallow depth that the hydrostatic pressure would not be great enough to retain gas in the coal matrix. Potential mining of the coal would not affect the potential production of oil because well drilling data does not show evidence of oil in the coal seam or above.

Cumulative Effects: No additional impacts would occur to the geology and minerals if the proposed Nance-Brown coal exchange does occur. BLM would need to take into account the impacts of previous coal development and other relevant activities when analyzing future coal projects involving federal coal and design projects to reduce impacts and/or develop appropriate mitigation strategies.

4.1.8 Hydrology

Direct and Indirect Effects to Hydrological Resources: Under this Alternative, the exchange of coal ownership would not result in impacts to hydrology. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area. The following analysis assumes the coal resource would be mined in the future. Specific as to how and when would be purely speculative. Therefore, this analysis will focus on a general description of the impacts of mining these tracts.

Before mining occurs, a reclamation and mine plan, including the restoration of the essential hydrologic function, will be subject to MDEQ and OSM approval. Agricultural beneficial uses would not be supported in isolated areas where groundwater is a major contributor to surface water needed for agricultural uses (PR RMP BLM 1984). However, Montana State regulations require surface coal mine permittees to replace any groundwater supply for domestic, agricultural, industrial, or any other legitimate use if such a supply is diminished, interrupted, or contaminated, to the extent of precluding use of the water, as a result of mining. Surface water quality and discharge impacts would be mitigated by compliance with State regulations.

The potential impacts to groundwater as a result of surface coal development, if it were to occur in the future, may include the following:

- Removal of the coal aquifer and any overburden and alluvial aquifers within the mining area and replacement of these aquifers with backfilled overburden material.
- A lowering of static water levels in the coal and overburden aquifers around the mine by dewatering and the removal of these aquifers within the mine boundaries. This reduction in static water levels would be long term and recharge to the backfill and adjacent undisturbed aquifers would occur following reclamation.
- Coal seam dewatering would increase evaporative losses of groundwater.
- Other groundwater impacts include changes in water quality (usually deterioration) within and outside the area that is mined and reclaimed as a result of communication between the reclaimed aquifer and the unmined aquifer and changes in recharge-discharge conditions and/or groundwater flow patterns.

The overburden and the coal aquifer would be removed during the mining process. These aquifers would be replaced with backfilled overburden and interburden materials. The physical characteristics of the reclaimed backfill material are dependent upon mining methods and premining overburden lithology. Blasting could increase communication between adjacent aquifers. The pre-mining aquifer system would be permanently replaced with a single aquifer which may support groundwater flow patterns that are similar to premining patterns. Overall, the permeability and porosity of the spoil aquifer is expected to be greater than the original material.

After mining and reclamation, groundwater discharges from the spoil aquifer would alter the water quality of the down gradient aquifers. The overburden would be highly fractured and the newly exposed particle surfaces would contain leachable minerals and salts that dissolve in the invading groundwater as the mine backfill resaturates and/or water from impoundments infiltrates. As water moves from the coal aquifer to the recently backfilled overburden, dissolved concentrations of sulfate, sodium, and bicarbonate ions would likely increase, raising the total dissolved solids (TDS) concentration of the backfill aquifer 50 to 200%. After the first pore volume has passed through the previously unsaturated material, soluble salts (calcite, dolomite, gypsum) are mostly flushed from the flow path and TDS concentrations in the spoils water are anticipated to be less than 20% of the maximum increase over background concentrations that had occurred (Van Voast and Reiten 1988).

Under typical conditions, groundwater from the backfill will move downgradient to the adjacent, unmined coal aquifer. Anaerobic conditions in the coal would allow for sulfate reduction, which decreases the sulfate concentration. Sulfate reduction also releases bicarbonate, resulting in precipitation of calcium and magnesium as calcite and dolomite (Van Voast and Reiten 1988). As a result, a reduction in the TDS concentration would occur and the sodium absorption ratio SAR would increase.

The magnitude of the impacts to surfacewater resources would be dependent on the specific activity, season, proximity to waterbodies, location in the watershed, upland and riparian vegetation condition, effectiveness of mitigation, and the time until reclamation success.

Coal development would cause the removal of vegetation, soil compaction, and surface disturbance in uplands within the watershed, ephemeral and intermittent drainages and 100-year floodplains of lesser streams including.

- Disruption of the surface drainage system (stream channels and their watershed areas) and the connectivity with groundwater during mining and replacement of these systems during reclamation.
- Changes in streamflow patterns during mining caused by sediment basins; construction of flood control reservoirs or diversion systems needed to prevent runoff from entering the pit; and by permitted discharges of pit inflows to streams or produced water.
- Changes in runoff rates due to changes in precipitation infiltration rates on restored land.
- Changes in erosion and sedimentation rates due to mining, vegetation removal, infrastructure development, hydromodification, topographic moderation, and changes in runoff rates.
- Changes in surface water quality.

Coal mining activities (e.g., surface disturbance, construction of roads, removal of spoils, rerouting of stream systems, and the presence of sediment ponds) would disrupt surface water, reduce streamflow downstream, and reduce peak flows. During mining, streams would be diverted around open pits and other affected areas and would be constructed with a motor grader or a dozer. Topsoil would be removed and stockpiled prior to constructing drainage diversions. Vegetated buffer strips, seeding, check dams, and erosion control such as straw bales, silt fences, wattles, or water bars would potentially be used to reduce erosion and sedimentation. Channel design for diversions would match pre-mine channel gradients, sinuosity, and cross-sectional shapes. Sedimentation would potentially be reduced by sedimentation ponds. Discharge of produced water during operations and discharge of groundwater with leached salts following operations would reduce surface water quality. Surfacewater quantity would increase by about 5% (PR RMP BLM 1984).

A change in surface runoff and natural erosion rates would be associated with topographic moderation. Where topography would be moderated and elevation lowered, there would be a decrease in surface runoff, peak flows, bank stability, and erosion rates and a change in sediment load. The change in base level would cause accelerated erosion, headcutting, incisement, and increased runoff upslope from the recontoured areas. Postmining, stream flow volume and water velocity would be reduced from premining flows due to topographic moderation and a lower elevation. As a result, more precipitation may be absorbed by the soil, sedimentation would increase, and postmining runoff volumes and peak flows may be slightly lower than premining values. There would be an increase in the near-surface bulk density of the soil resources after reclamation. As a result, the average soil infiltration rates would generally decrease, which would increase the potential for runoff and soil erosion. Reclamation would reconstruct drainage with the approximate original contour and lower surface elevation, causing permanent changes in stream channels (PR RMP BLM 1984).

Once vegetation growth and density on reclaimed areas becomes sufficiently reestablished, many of the erosion sediment controls would no longer be necessary and would then be removed and reclaimed.

Monitoring would be conducted by the mining company and would be done in accordance with federal and state requirements to assure compliance with approved permits and to protect surface and groundwater quantity and quality.

Cumulative Effects: Cumulative effects would be the result of past, current, and future coal exploration or development and land use activities such as grazing within the watershed and water quality degradation associated with coal-fired power plants. Accelerated erosion, sedimentation, and reduced water quality would be compounded by the combination of these activities spatially and temporally. Groundwater would be impacted by a cumulative replacement of aquifers with backfill aquifers, decreases in water quality associated with increased TDS and sulfates, and drawdown associated with mine dewatering. The extent of the increases in TDS discharging from reclaimed areas would be difficult to predict.

4.1.9 Lands and Realty

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership (title) would occur. The change in coal ownership would reduce the amount of federal coal within the Ashenhurst Area and increase the amount of federal coal in the Tongue River valley. The change in coal ownership would result in the exchange proponents (Nance-Brown) owning coal that has the potential to be mined and the United States owning AVF coal in the Tongue River valley that would not be mined because of the requirements of Section 510(b)(5) of SMCRA. Surface ownership would not be affected by the exchange of coal ownership.

The Federal coal would be conveyed subject to a reservation of all Federal minerals other than coal and subject to existing rights such as oil and gas leases if any and subject to existing coal exploration licenses. All minerals other than coal on 624.21 acres of the federal coal lands would remain under BLM administration in T. 1 N., R. 40 E., Section 26, N $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ and T. 1 S., R. 41 E., Section 6, Lots 3, 4, 5, 6, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$. No BLM rights-of-way or other BLM land use authorizations would be issued because the Ashenhurst Area does not include any surface administered by BLM.

Cumulative Effects: No additional impacts to the coal ownership would occur if the proposed Nance-Brown coal exchange does occur.

4.1.9.1 Split Estate

Ashenhurst Tract

Direct and Indirect Effects: Under this Alternative, the private surface owners with land over the identified federal coal tracts within the Ashenurst Tract area could potentially be impacted from the proposed coal exchange. The federal regulations implementing SMCRA section 714(c) are located at 43CFR subpart 3427 and set out protections that shall be afforded to qualified surface owners of split estate lands as defined by SMCRA section 714(e) and 43CFR 3400.0-5gg. Specifically, the BLM regulations require the submission of evidence of written surface owner consent to enter and commence mining from a qualified surface owner when lands are considered for lease. However, if the federal coal estate is transferred to a private owner through exchange, a qualified surface owner may not have the same protections under state law. See Mont. Admin. R. 17.24.303(1)(o)(i). If the surface owners are qualified as described by SMCRA and the regulations, the loss of the ability to refuse to consent to a federal lease of the coal may impact the value of the surface.

Nance-Brown Private Surface

Direct and Indirect Effects: There would be no change to surface ownership on the privately owned Nance-Brown property. Only the Nance-Brown AVF coal would be exchanged, no other minerals would be exchanged through this proposed action.

With the State of Montana determination of unminable AVF coal along the Tongue River and SMCRA, Nance-Brown AVF coal would not be surface mined if the exchange takes place; thus, the likelihood of any future federal lease on this property would be remote.

4.1.10 Livestock Grazing

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to livestock grazing. The following analysis assumes the coal in the Ashenurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

Future coal development would result in the temporary loss of vegetation for livestock grazing (e.g., direct removal, introduction of unpalatable plant species, etc.), decrease the palatability of vegetation due to fugitive dust, disrupt livestock management practices, involve vehicle collisions, and decrease grazing capacity. These impacts could vary from short-term impacts to long-term impacts depending on the type of development, the success of reclamation, and the type of vegetation removed for coal development.

Cumulative Effects: No impacts would occur to livestock grazing if the proposed Nance-Brown coal exchange does occur. Cumulative impacts to livestock grazing would increase as additional land is disturbed by mining and other activities. These impacts would moderate as land is reclaimed.

4.1.11 Recreation

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to recreation. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

All of the surface lands in the Ashenhurst Tract area are privately owned. Access to these lands and use of these lands for recreational purposes is only allowed with landowner permission. Development of coal in the Ashenhurst Tract area would decrease or eliminate recreational opportunities during mining development and reclamation.

Cumulative Effects: No impacts would occur to recreation if the proposed Nance-Brown coal exchange does occur. Cumulative impacts to recreation would increase as additional land is disturbed by mining and other activities. These impacts would moderate as land is reclaimed.

4.1.12 Social and Economic Conditions

Direct and Indirect Effects: A direct impact of the approval of the exchange of all or part of the unleased Federal coal in the Ashenhurst Tract area would be the potential loss of Federal revenues, including the state's share, if the coal is developed. The forgone revenue would result from the loss of lease bonus, rents, and royalties from the acreage of unleased federal coal that would be exchanged. The state receives approximately one half of the federal revenues. The state distributes one quarter of the federal revenues to the county.

The most recent federal lease sale at the Rosebud Mine was in 1999, and the bonus bid was \$0.16 per ton. The federal lease rent is \$3 per acre. The average statewide Free On Board (FOB) mine price of coal in Montana was \$12.31 per ton in 2008, according to the Energy Information Administration. The federal royalty rate is 12.5% of the mine price or \$1.54 per ton in 2008. In order to compare the values and to estimate the loss of revenues on a per ton basis, the 1999 bonus bid and the 2008 FOB mine price were adjusted to 2009 dollars using the change in the Consumer Price Index (CPIU). The adjusted values, of the bonus and the royalty, would be \$1.74 per ton in 2009 dollars. However, the adjusted bonus and royalty figures do not reflect what the current market values are.

According to the RFD, mining the reserves could begin in approximately ten years, 2020, and continue for another 20 years, 2040. Currently, the Ashenhurst Reserve Area contains an estimated 81.4 million tons of recoverable unleased federal coal. If the area was to be developed the lease sale would occur approximately three years prior to mining and the bonus bid is paid in five equal payments.

The potential loss of federal revenue is dependent on the amount of unleased federal coal exchanged, the bonus paid for the lease and the FOB mine price at the time of production.

Direct and Indirect Effects to Environmental Justice: Under this Alternative, the exchange of coal ownership would not result in adverse impacts to minority or low income populations or to human health.

Cumulative Effects No impacts would occur in the short-term to social and economic conditions if the proposed Nance-Brown coal exchange does occur

Potential future development of the area may generate impacts to people living near or using the area in the vicinity of the potential mine expansion. The mine could operate for an additional 20 years if the reserves are developed. Mine production would be at the same rate so there would not be an increase in employment or taxes. However, a positive benefit would be realized from the continuation of tax revenues and employment associated with mining activity if the reserves are developed.

4.1.13 Soils

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to soils. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

If coal development did take place at some future point, then topsoil, subsoil, and overburden would be removed and replaced. Such actions result in altered postmining soils. The Mine permitting process requires the operator to map and test (physical and chemical) soils for revegetation suitability and soil salvage planning. Soil material determined to be unsuitable growth medium (e.g., clinker and sandstone outcrops) would not be salvaged as topsoil or subsoil. However, surface rock content would be replaced in order to re-establish premining conditions.

Coal exploration, extraction, and infrastructure development (e.g., roads, ancillary facilities) would cause soil mixing and compaction. Such surface disturbing acts reduce ground cover (e.g., biological soil crust, vegetation, litter, and rock), exposing the soil resource to accelerated erosion by wind and water and mass failure; resulting in the irretrievable loss of topsoil and nutrients and potentially resulting in sedimentation and fugitive dust formation. Surface disturbances also change soil structure, heterogeneity (variable characteristics), temperature regimes, nutrient cycling, biotic richness, and diversity. Along with these likely results of mining, mixed soils have decreased bulk density, and altered porosity, infiltration, air-water relationships, salt content, and pH (Perrow and Davy, 2003; Bainbridge 2007). Soil compaction results in increased bulk density, and reduced porosity, infiltration, moisture, air, nutrient cycling, productivity, and biotic activity (Logan 2001; Perrow and Davy, 2003; Bainbridge 2007). The probability and magnitude of these effects are dependent upon local site characteristics, climatic events, and the specific mitigation applied to the project as part of the mine permit approved by MDEQ.

Altered pH and reduced soil stability, organic matter content, microbial mass, biotic richness and diversity, and phosphorus and nitrogen content would take decades to hundreds of years to recover (Perrow and Davy, 2003). Mixed or removed soil horizons never recover calcium carbonate and clay translocation, texture class, rock fragment content, structure, and depth to bedrock. Such impacts are compounded in areas of poor reclamation suitability, specifically those prone to accelerated water erosion. Considering the reclamation suitability of the site prior to the disturbance and prioritizing land use to sites resilient to disturbance, would minimize the costs and increase the success of mitigation and reclamation. Soil recovery following disturbance would be accelerated by mitigation and reclamation in order to reduce natural recovery rates, typically hundreds of years, to within several decades (Perrow and Davy, 2003). Mitigation measures included with the mine permit approved by MDEQ that minimize the total area of disturbance, control wind and water erosion, maintain topsoil viability, and reduce compaction, as well as rapid implementation of reclamation, would conserve soil resources.

Land application (including dust control) of produced water high in soluble-salt content ($EC > 0.5$ mmhos/cm and/or $SAR > 6$) would lead to surface crusts (chemical and physical), reduced infiltration, increased surface runoff, reduced productivity, and/or biotic toxicity as salts accumulate (McCauley and Jones 2005). Unlined water impoundments would change subsurface water flow regimes, altering natural soil formation processes including nutrient cycling, translocation of clay and calcium carbonate, and salt distribution. Salts would leach into the soil profile below and surrounding the impoundment, making the soil toxic to biota. Moist soils surrounding the impoundment would also be susceptible to compaction. Prohibiting land application of water high in soluble-salt content and lining water impoundments would avoid such impacts. Toxic soils contaminated by accumulated salts from unlined impoundments would require burial, removal, or in-situ remediation.

Surface-disturbing actions provide ideal conditions for weed establishment. Many weed species alter the soil environment by allelopathy, or by reducing soil fertility or moisture; resulting in accelerated erosion and altered biodiversity (DiTomaso, 2000; Radosevich et al. 2007). Vehicles are vectors for weedy species; utilization of vehicle wash stations would minimize the transport and establishment of noxious weeds. Vehicles also cause removal of ground cover, compaction, rutting, increased surface runoff, accelerated erosion, sedimentation, and fugitive dust. Disturbing areas prone to producing dust would reduce air quality and inhibit vegetative production. Wet soils would be especially susceptible to rutting, leading to braiding, channeling, accelerated erosion, and sedimentation. Considering soil resource constraints when maintaining and constructing infrastructure would encourage sustainable use of the soil resource. Designing infrastructure on stable, high-bearing-strength locations, with proper drainage would avoid destabilizing erosive soils. Developing roads with gentle grades and along contours would reduce accelerated erosion from surface runoff. Road/infrastructure maintenance would include control of surface runoff, accelerated erosion, sedimentation, rutting, and fugitive dust. Avoiding vehicle use during conditions which lead to ruts greater than four inches deep would reduce water erosion, channeling, and braiding.

Premining soils are distinguished by their physical, biological, and chemical characteristics. Postmining soils would be homogenized and replaced at a more uniform depth. Vegetative productivity would be restored at the end of mining as a condition of bond release. Replaced soils would return to natural rates of erosion and support stable and productive vegetation capable of sustaining post-mining land uses, rangeland and wildlife habitat, within 2-5 years following reclamation. However there would be localized differences in productivity because:

- Replaced topsoil depths would be more uniform. Vegetative productivity would be reduced in areas where topsoil is thinner than pre-disturbance conditions.
- Soil chemical and physical characteristics would be homogenized: equalizing soil productivity and erodibility.
- Soils poorly suited to reclamation would not be salvaged or would be diluted by other soil materials to create suitable growth medium; such areas would support vegetative communities different from premining conditions.
- Stockpiling soils would additionally: reduce biotic activity and vegetative propagules, and alter structure, texture, and nutrient cycling. Direct-hauling topsoil onto re-graded spoils would maintain soil viability and promote rapid vegetation recovery.

Cumulative Effects: Historic and on-going activities adjacent to, or within, the Ashenhurst Tract area include: minerals exploration and development, livestock grazing, vehicle use on and off-road, recreation, infrastructure, fire suppression, altered fire regimes, noxious weed infestation, pollution, and agriculture. The cumulative effects of such activities have contributed to compaction, increased surface runoff, mass failure, and accelerated erosion by wind and water; resulting in sedimentation, fugitive dust formation, and the irretrievable loss of topsoil and nutrients. Long-term impacts include altered pH and reduced soil stability, organic matter content, microbial mass, biotic richness and diversity, and phosphorus and nitrogen content (Perrow and Davy, 2003). Permanent impacts include altered calcium carbonate and clay translocation, texture class, rock fragment content, structure, and depth to bedrock.

The reclaimed lands would have reduced elevation and gentler slopes than pre-mine lands, which would reduce surface runoff rates and increase infiltration rates, altering natural erosion and deposition rates. Reinstating grazing following reclamation would have a collective effect on the soil resource, augmenting impacts to the soil system within those areas. Surface-disturbing actions in areas of weed infestations would compound the degradation of the soil resource, which has already been altered by the infestation. Extraction and infrastructure development would cause soil system fragmentation, leading to altered soil heterogeneity, microclimate, hydrology, nutrient cycling, biotic richness, and diversity (Perrow and Davy, 2003). From the edge of the fragmented patch, localized impacts would include microclimatic changes tens of meters into the patch; while altered biota and nutrient cycling would extend even further into the patch (Perrow and Davy, 2003). On a landscape-scale, pre-existing disturbance regimes (e.g., fire) would be altered; changing natural rates of soil formation (Perrow and Davy, 2003).

4.1.14 Solid or Hazardous Wastes

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to or from solid or hazardous waste. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

Solid and hazardous wastes could be generated by mining activities. The handling, storage, treatment and disposal of all wastes generated by mining activities would be addressed in the mine permit approved by MDEQ.

Cumulative Effects: No impacts would occur to or from solid or hazardous waste if the proposed Nance-Brown coal exchange does occur.

4.1.15 Topography and Physiography

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to topography and physiography. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

If the Ashenhurst Tract is developed in the future; the resulting coal mining would permanently alter the topography. Topsoil would be removed from the land and stockpiled or placed directly on recontoured areas. Overburden would be blasted and stockpiled or directly placed into the already mined pit, and coal would be removed. The existing topography on the tracts would be substantially changed during mining.

Typically, a direct permanent impact of coal mining and reclamation is topographic moderation. After reclamation, the restored land surfaces are generally gentler, with more uniform slopes and restored basic drainage networks. Portions of the original topography of the tracts are somewhat rugged. As a result, the expected post-mining topography would be more subdued, but would blend with the undisturbed surroundings. Following reclamation, the average post-mining topography would be slightly lower in elevation than the pre-mining topography due to removal of the coal. The removal of the coal would be partially offset by the swelling that occurs when the overburden and interburden are blasted, excavated, and backfilled. The land surface would be restored to the approximate original contour or to a configuration approved by MDEQ during the mine permitting process. Modifications to the landscape would be very noticeable during mining activities and less noticeable after completion of reclamation.

Direct impacts resulting from topographic moderation include a reduction in microhabitats (e.g., cutbank slopes and bedrock bluffs) for some wildlife species and a reduction in habitat diversity, particularly a reduction in slope-dependent shrub communities and associated habitat. A potential indirect impact may be a long-term reduction in carrying capacity for big game, small game, reptiles, amphibians and bats.

A change in surface runoff and natural erosion rates would be associated with topographic moderation. Where topography would be moderated and elevation lowered, there would be a decrease in surface runoff, peak flows, bank stability, and erosion rates and a change in sediment load. The change in base level would cause accelerated erosion, incisement, and increased runoff upslope from the recontoured areas. The approximate original drainage pattern would be restored. Any topographic changes would not conflict with regional land use, and the post-mining topography would adequately support anticipated land use of the Ashenhurst Tract.

Cumulative Effects: No impacts would occur to topography and physiography if the proposed Nance-Brown coal exchange does occur. If surface coal mining is permitted and reclamation is successful, topography would be modified within the permit boundary of the Ashenhurst tracts.

4.1.16 Vegetation

Direct and Indirect Effects to Vegetation: Under this Alternative, the exchange of coal ownership would not result in impacts to vegetation. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

Subsequent development of the coal would directly impact the vegetation and impacts would depend on the vegetation type, the vegetative community composition, soil type, hydrology, and the topography of the parcels. Coal development activities would affect vegetation by destroying the vegetation, churning soils, loss of substrates for plant growth, impacting biological crusts, disrupting seedbanks, burying individual plants, reduction of germination rates, covering of plants with fugitive dust, and generating sites for undesirable weedy species. In addition, development could reduce available forage or alter livestock distribution leading to overgrazing or other localized excess grazing impacts to palatable plant species. If these impacts occurred after seed germination but prior to seed set, both current and future generations could be affected.

Direct and Indirect Effects to Special Status Plant Species: No impacts would occur to special status plant species because none are known to exist within the Ashenhurst Tract area.

Direct and Indirect Effects to Invasive Species: Under this Alternative, the exchange of coal ownership would not result in impacts to invasive species. The following analysis assumes the coal resource would be mined in the future. Specific as to how and when would be purely speculative. Therefore, this analysis will focus on a general description of the impacts of mining these tracts.

Coal development within the Ashenhurst Tract area could allow for the spread on noxious weeds. Spotted knapweed is a problem within the area. A reclamation plan for a

proposed coal mine must include actions to control and monitor invasion of noxious weed plant species. Native vegetation from surrounding areas would gradually re-establish and become prevalent on properly reclaimed lands with a noxious weed treatment plan in place.

Cumulative Effects: No impacts would occur to special status plant species or an increase of invasive species if the proposed Nance-Brown coal exchange does occur. Cumulative impacts from invasive species could increase if disturbance from mining and other activities does take place. These impacts would moderate as land is reclaimed.

4.1.17 Wildlife and Fisheries/Aquatics:

4.1.17.1 Fisheries/Aquatics

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to fisheries or aquatics. The following analysis assumes the coal in the Ashenhurst Area would be mined as described in the RFD (Appendix A). Therefore, this analysis will focus on a general description of the impacts if mining was to occur in the area.

If coal development did take place then non-game fish (minnows, bullheads, and suckers), amphibian, and reptile habitat in the intermittent streams and coulees within the Ashenhurst Tract would be affected. Specifically, alteration of the hydrologic regime, dewatering aquifers, and excessive sedimentation from mining activities, roads, and stream crossings would degrade habitat. Often the effects of mining on streams and stream biota are also realized downstream of the event. If salts, metals, or excessive sediments enter the drainages and are transported downstream to Rosebud Creek then Sauger (*Stizostedion canadense*) could suffer from toxic impacts and/or degraded spawning and rearing habitat if coal operation were conducted; however, MDEQ mine permit requirements address surface runoff and sediment control within a mine permit boundary.

Additionally, dewatering aquifers near the intermittent drainages within the Ashenhurst Tract and near Rosebud Creek has the potential to decrease spring or seepage flows that help to maintain stream temperatures especially in winter and summer extremes.

Cumulative Effects to Fisheries/Aquatics: The cumulative impacts could potentially degraded habitat within the coulees and intermittent drainages and potentially downstream to Rosebud Creek if sensitive soils that would not benefit from reclamation are unable to be reclaimed. Specifically, this could be a constant source of erosion filling up pools in the streams and coulees with sediment. Additionally, alteration of the drainage contour and hydrologic regime would alter the habitat-forming events that occur with a normative flow regime and intact floodplain. Amphibians and reptile reproduction in the area could decrease as they use the seasonal high water for breeding and rearing.

4.17.1.2 Wildlife

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to wildlife. The following analysis assumes the coal resource would be mined in the future. Specific as to how and when would be purely speculative. Therefore, this analysis will focus on a general description of the impacts of mining these tracts. Should a Threatened, Endangered or Candidate species or habitat be found, the coal companies would be subject to the provisions as identified in the Threatened and Endangered Species Act. BLM has determined the proposed action would have “No Affect” on Threatened, Endangered or Candidate Species.

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

Big game could potentially be displaced from portions of the Ashenurst Tract to adjacent ranges during mining. Mule deer would be most affected as the Ashenurst Tract contains mule deer habitat. Pronghorn would not be substantially impacted, given they are scattered throughout the Ashenurst Tract and suitable pronghorn habitat is available in adjacent areas. Elk would likely be displaced as they have a low tolerance for disturbance. Big game displacement would be incremental, occurring over several years and allowing for gradual changes in distribution patterns. Big game residing in the adjacent areas could be impacted by increased competition with displaced animals. Noise, dust, and associated human presence would cause some localized avoidance of foraging areas adjacent to mining activities. On existing surface mines big game will occupy areas adjacent to and within active mine operations, suggesting that some animals may become habituated to such disturbances.

Big game animals are highly mobile and can move to undisturbed areas. There may be more restrictions on big game movement on or through the Ashenurst Tract due to additional fences, spoil piles, and pits related to mining. During winter storms, pronghorn may not be able to negotiate these barriers. SMCRA requires that fences, overland conveyors, and other potential barriers be designed to permit passage for large animals [30 CFR 816.97(e)(3)]. MDEQ guidelines require fencing to be designed to permit large mammal passage to the extent possible.

After mining and reclamation, alterations in the topography and vegetative cover, particularly the reduction in sagebrush density and loss of trees, would cause a decrease in carrying capacity and diversity on the tracts. Sagebrush and trees would gradually become re-established on the reclaimed land, but the topographic changes would be permanent.

Medium-sized mammals (such as coyotes, foxes, skunks, and raccoons) would be displaced to other habitats by mining, potentially resulting in increased competition and mortality. However, these animals may rebound on reclaimed areas, as forage developed and small mammal prey species recolonize. Direct losses of small mammals would be higher than for other wildlife, because the mobility of small mammals is limited and many small mammals retreat into burrows when disturbed. Therefore, populations of such prey animals such as voles, mice, chipmunks, and rabbits would decline during mining. However, these animals have a high reproductive potential and tend to re-invade and adapt to reclaimed areas quickly. A research project on habitat reclamation on mined lands within the Powder River Basin (PRB) for small mammals and birds concluded that reclamation objectives to encourage the recolonization of small mammal communities are being achieved (Shelley 1992). The study evaluated sites at five mines in Campbell County, Wyoming. A recent study involving six Montana mines indicated that small mammals are recolonizing reclaimed areas and species richness is similar to native habitats (Clayton, et al. 2006).

Mining/disturbing the Ashenhurst Tract is not anticipated to significantly impact regional raptor populations. Local populations including individual birds or pairs may be impacted and would require further study prior to leasing/permitting.

4.1.17.3 Raptors

Physical destruction of most inactive migratory bird nests/nest sites is not, in and of itself, a violation of the Migratory Bird Treaty Act (MBTA). However, any activity that results in the destruction of eggs or death of birds (including nestlings) constitutes a 'take', and is a violation of MBTA. The Bald and Golden Eagle Protection Act (BGEPA) prohibits "knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing." Permits for nest manipulation, including removal or relocation may, under certain circumstances, be issued only for inactive golden nests. The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over issuing golden eagle nest take/relocation permits. Removal of the golden eagle nest would require such an approval or other mitigation.

Mining near raptor territories would impact availability of raptor forage species. During mining, nesting habitat could be created by the excavation process (highwalls), as well as through enhancement efforts (nest platforms and boxes). However, due to the proximity to mining activity and nest site preference, some species of raptors are not likely to relocate to artificial nesting habitat. SMCRA requires use of the best technology currently available for protection of fish, wildlife, and related environmental values, including ensuring electric powerlines and other transmission facilities are designed and constructed to

minimize electrocution hazards to raptors. After mining, the reclamation plan would reestablish the ground cover necessary for the return of a suitable prey base.

4.1.17.4 Upland Game Birds

Sage-grouse may be found on the Ashenhurst Tract and adjacent lands. No historic sage-grouse strutting grounds were located within one mile of the tracts. Past surveys on and adjacent to the tracts have not identified sage-grouse use.

The impacts of mining/disturbing the Ashenhurst Tract on sharp-tailed grouse would be the temporary loss of nesting habitat and disturbance to breeding activities when the mining operations approach to within close proximity of the birds' dancing grounds. Monitoring of sharp-tailed grouse activities has documented the birds can change breeding sites. During reclamation, shrubs, including big sagebrush, would be reestablished on reclaimed lands; reclaimed lands would be graded to create swales and depressions; and monitoring of sharp-tailed grouse activity would continue in the area before, during, and after mining.

Other upland game bird species (i.e., mourning doves, wild turkey, and gray partridge) potentially occurring on the Ashenhurst Tract could be displaced to adjacent habitats during mining. These birds are highly mobile and can move to undisturbed areas (Lowe and Flake 1988, Hewitt 1967, Kuck 1968, Allen 1984). Their populations are relatively low in the Ashenhurst Tract; therefore, this displacement should not increase competition and mortality.

4.1.17.5 Migratory Bird Species

Displaced songbirds including those Migratory Bird Species of Management Concern would have to compete for available adjacent territories and resources when their habitats are disturbed by mining operations. This competition would result in some mortality where adjacent habitat is at carrying capacity. Losses would also occur when habitat disturbance coincides with egg incubation and rearing of young. Impacts of habitat loss would be short-term for grassland species but would last longer for tree- and shrub-dependent species. Concurrent reclamation would minimize these impacts. A diverse seed mixture planted in a mosaic with a shrubland phase would provide food, cover, and edge effect. Other habitat enhancement practices include the restoration of diverse land forms, direct topsoil replacement, and the construction of brush piles, snags and rock piles. A research project on habitat reclamation on mined lands within Campbell County, Wyoming, for small mammals and birds concluded that the diversity of song birds on reclaimed areas was slightly less than on adjacent undisturbed areas, although their overall numbers were greater (Shelley 1992).

Waterfowl and shorebird habitat on the tracts is minimal and production of these species is very limited. Mining/disturbing the tracts would have a negligible effect on migrating and breeding waterfowl. Sedimentation ponds created during mining would provide interim habitat for these fauna. No delineated wetlands occur on the Ashenhurst Tract.

4.1.17.6 Special Status Species

T&E species potentially occurring in the area include the black-footed ferret. This species has not been observed in the area and no active prairie dog colonies are present. The bald eagle was recently delisted and is no longer a T&E species but will continue to be protected by the BGEPA and MBTA. The least tern is listed as endangered and may migrate through the area but the bird has not been observed in the area and nesting habitat (unvegetated sand-pebble beaches and islands of large reservoirs and rivers) is not present within the potential disturbance areas so the potential for impacts is low. For these reasons we have determined there would be “No Affect” to T&E Species.

Various wildlife species listed by the BLM as sensitive species are listed in Chapter 3. Most of these species will be temporarily displaced but current reclamation practices will promote the return of these species once reclamation has been completed. Species requiring special consideration are discussed above.

Wildlife and habitats would be affected by mining activities in and adjacent to the Ashenhurst Tract area.

Cumulative Effects to Wildlife: No additional impacts would occur to wildlife if the proposed Nance-Brown coal exchange does occur. Cumulative impacts to most wildlife species would increase as additional habitat is disturbed by mining and other activities. These impacts would moderate as land is reclaimed. Raptor and grouse breeding areas have been diminishing statewide due, in part, to land use changes. Coal mining has been identified as potential contributors to the decline in this breeding habitat. Therefore, surface occupancy and disturbance restrictions, as well as seasonal restriction stipulations, have been applied to operations occurring on or near these important areas. These restrictions have helped protect important raptor and grouse habitat.

The placement of artificial nesting structures and planting of trees on land reclaimed by surface coal mines would gradually replace some raptor nesting and perching sites affected by mining. There is no important habitat for waterfowl on the Ashenhurst Tract, so mining would not substantially contribute to impacts to those species. Small- and medium-sized animals would move back into the areas once reclamation is completed.

Numerous grazing management projects (fencing, water development, vegetative treatments, and grazing treatments) have also impacted wildlife habitat in the area. The impacts of these developments have proven beneficial to some species and detrimental to others. Fencing has aided in segregation and distribution of livestock grazing, but sheep-tight woven wire fence has restricted pronghorn movement. Water developments are used by wildlife; however, without proper livestock management, many adjacent areas can become overgrazed. The developed reservoirs provide waterfowl, fish, and amphibian habitat. Vegetation manipulations have included the removal or reduction of native grass-shrublands and replacement with cultivated crops (mainly alfalfa/grass hay), as well as a general reduction of shrubs (mainly sagebrush) in favor of grass. These changes have increased spring and summer habitat for grazing animals but have also reduced the

important shrub component that is critical for winter range, thus reducing winter survival for big game and sage-grouse.

Large-scale surface coal mining could potentially result in cumulative impacts to big game due to habitat loss; restrictions in seasonal and daily movement caused by railroads, access roads, and mining operations; poaching; urban development; range overuse; possible lack of water sources; increased road kills; and crop depredation. No severe direct mine-caused mortalities are likely to occur and no long-lasting impacts on big game populations are likely on reclaimed mined sites.

The Ashenhurst Tract is within the Montana Department of Fish, Wildlife and Parks (MDFWP) pronghorn, elk and deer Hunting District 700.

Mining/disturbing the Ashenhurst Tract is not anticipated to significantly impact regional raptor populations. The regional reproductive capacity of nesting pairs of raptors could decline as a result of mining in the Ashenhurst Tract area if raptors do not adapt to the loss of existing nests. The creation of artificial raptor nest sites and raptor perches may ultimately enhance some raptor populations in the mined area. SMCRA requires surface coal mine operators ensure electric power lines and other transmission facilities are designed and constructed to minimize electrocution hazards to raptors. However, where power poles border roads and road kills of scavenging eagles may occur. Any influx of people into previously undisturbed land may also result in increased disturbance of nesting and fledgling raptors.

Cumulative habitat disturbance from already-approved and proposed mining in the vicinity of the Ashenhurst Tract could affect regional sharp-tailed and sage-grouse populations because leks could potentially be disturbed in previously approved mine boundaries. Also, noise related to the mining activity could influence grouse reproductive success by impacting occupancy of certain areas where noise is a factor. Grouse breeding grounds close to active mining would likely be abandoned if mining-related noise elevates the existing ambient noise levels.

Cumulative impacts to waterfowl would be minor because most of these birds are transient and most of the ponds are ephemeral. In addition, impoundments and reservoirs impacted by mining would be restored. Sedimentation ponds and wetland mitigation sites would provide areas for waterfowl during mining.

The existing mines in the Colstrip area would cumulatively cause a reduction in habitat for other mammal and bird species not specifically addressed above. Many of these species are highly mobile, have access to adjacent habitats, and possess a high reproductive potential. Habitats adjacent to existing and proposed mine areas include sagebrush shrublands, upland grasslands, bottomland grasslands, improved pastures, wetlands, riparian areas, and ponderosa pine woodlands. As a result, these species should respond quickly and invade suitable reclaimed lands as reclamation proceeds. A recent study involving six mines in Montana indicated that small mammals are recolonizing reclamation and species richness is similar to native habitats (Clayton, et al. 2006).

There would be no impact to threatened and endangered species and BLM determined the Ashenhurst Tract does not currently contain habitat for any T&E species.

Any additional cumulative impacts of mining the Ashenhurst Tract will be assessed within the MDEQ's review during the mine permit process if coal development is approved and also any BLM or OSM review during the leasing/mine permitting stage if additional federal coal is leased on the Ashenhurst Tract.

4.1.17.7 Special Status Species

Direct and Indirect Effects: Under this Alternative, the exchange of coal ownership would not result in impacts to special status species. The following analysis assumes the coal resource would be mined in the future. Specific as to how and when would be purely speculative. Therefore, this analysis will focus on a general description of the impacts of mining these tracts. Coal development which results in surface disturbance could indirectly impact special status aquatic and terrestrial wildlife species. These impacts could include loss or reduction in suitability of habitat, improved habitat for undesirable competitors, species shift to disturbance associated species, nest abandonment, mortalities resulting from collisions with vehicles and power lines, barriers to species migration, habitat fragmentation, increased predation, habitat avoidance, and displacement of wildlife species resulting from human presence. The scale, location, and pace of development, combined with implementation of mitigation measures and the specific tolerance of the species to human disturbance all influence the severity of impacts to wildlife species and habitats, including Threatened, Endangered, Candidate, Proposed, and other special status species.

Cumulative Effects: No impacts would occur to special status species if the proposed Nance-Brown coal exchange does occur. Cumulative impacts to special status species would increase as additional habitat is disturbed by mining and other activities. These impacts would moderate as land is reclaimed.

4.2 EFFECTS FROM ALTERNATIVE B – NO ACTION

The action of not approving the proposed Nance-Brown coal exchange would have no direct or indirect impacts to natural resources within the Ashenhurst Tract and the Nance-Brown AVF coal tracts.

The federal unleased coal in the Ashenhurst Tract would remain available for further consideration for future leasing or exchange. If BLM received a lease or exchange proposal, BLM would complete an environmental analysis before issuing a Federal coal lease or before approving an exchange of coal ownership. BLM would require the submission of written surface owner consent from qualified surface owners of split estate lands when surface mineable Federal coal is considered for lease. As a result of the environmental analysis and qualified surface owner consent, BLM would determine whether or not to issue a Federal coal lease, including necessary stipulations, or potential future exchange of coal ownership.

A complete mine permit application would have to be submitted to MDEQ for review and approval before mining activities could occur on Federal and other coal leases. BLM and other Federal agencies would have the opportunity to review the mine permit application and the MDEQ environmental analysis when it includes federal coal and before approval of the application.

4.2.1 Air Quality

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to air quality. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application.

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.2 Climate Change

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to climate change. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application.

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.3 Cultural Resources

Direct and Indirect Effects:

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to cultural resources. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application. MDEQ and BLM have the responsibility to analyze impacts to cultural resources resulting from a coal development.

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.4 Indian Trust Assets and Native American Concerns

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to Indian Trust Assets and Native American Concerns. If federal coal was

leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: BLM would need to take into account traditional cultural values in approving any future coal related development or leasing in the region.

4.2.5 Paleontological Resources

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to Paleontological Resources. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.6 Geology and Minerals

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to geology and minerals. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.7 Hydrology

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to hydrology. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.8 Lands and Realty

Direct and Indirect Effects:

No change in ownership would occur as a result of implementing this alternative. Nance-Brown would retain ownership of the AVF coal which would not be allowed to be surface mined under SMCRA and would not acquire minable coal. The BLM would not be in compliance with the Section 510(b)(5) of SMCRA as directed by the Stipulation filed with the Federal District Court to complete the proposed exchange. Surface owner consent would be required for qualified surface owners of the surface over the federal coal prior to leasing.

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.9 Split Estate

Direct and Indirect Effects: If the exchange does not take place, the BLM would not be compliance with Section 510(b)(5) of SMCRA as directed by the Stipulations filed with the Federal District Court to complete the mandatory AVF fee coal exchange. The BLM would have to work with Nance-Brown to find another tract that would satisfy Nance-Brown's interest. If the exchange does not occur it would result in additional time and money to complete.

4.2.10 Livestock Grazing

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to livestock grazing. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.11 Recreation

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to recreation. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.12 Social and Economic Conditions

Direct and Indirect Effects: There would not be an impact to the local economy. If coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects are the same as Alternative A.

Cumulative Effects: The mine would continue operating according to the RFD appendix A, there would be no anticipated change in the levels of employment, income or taxes and no loss of federal revenues.

4.2.13 Environmental Justice

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to environmental justice. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.14 Soils

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to soils. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.15 Solid or Hazardous Wastes

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to solid or hazardous wastes. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.16 Topography and Physiography

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to topography and physiography. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.17 Vegetation

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to vegetation. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Direct and Indirect Effects to Special Status Species: By not approving the proposed exchange, there would not be an impact to special status species. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application

Direct and Indirect Effects to Invasive Species: By not approving the proposed exchange, there would not be an impact to invasive species. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon receipt of a federal coal lease application.

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

4.2.18 Wildlife and Fisheries/Aquatics

Direct and Indirect Effects: By not approving the proposed exchange, there would not be an impact to wildlife and fisheries/aquatics. If federal coal was leased and coal mining operations were conducted as described in the RFD (Appendix A), then direct and indirect effects could be the same as Alternative A or could be different from Alternative A if federal coal leases include stipulations. BLM would conduct further NEPA analysis upon

receipt of a federal coal lease application

Cumulative Effects: The impacts could be the same as Alternative A, but would be analyzed in detail by BLM when a federal coal lease application is received.

CHAPTER 5

CONSULTATION AND COORDINATION

5.1 PREPARERS AND RESPONSIBILITY

Dan Fox, MCFO AVF Project Manager	Project Lead
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Julie Cymore, MCFO Hydrologist	Groundwater/ Surface Hydrology
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Erik Broeder, MCFO Rangeland Management Specialist	Livestock Grazing, Vegetation
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Chuck Laakso, MCFO Petroleum Engineer	Geology and Minerals
Melisa Schroeder, MCFO Soil Scientist	Soils
Doug Melton, MCFO Archeologist	Cultural Resources, Indian Trust & Native American Concerns
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David Coppock, MSO Geologist/Mineral Appraiser	Geology and Minerals
Robert Goivanini, MSO Mining Engineer	Geology and Minerals
Jake Chaffin, MCFO Fisheries Biologist	Aquatics and Fisheries
Pam Wall, MCFO Realty Specialist	Lands & Realty
Brenda Witkowski, MCFO Natural Resource Specialist	Vegetation/Invasive Species

5.2 Document Review

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David Breisch	MCFO Assistant Field Manager
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Todd Yeager	MCFO Assistant Field Manager
Craig Haynes	MSO Realty Specialist
Ed Hughes	MSO Mineral Economist
John Thompson	MSO NEPA Coordinator
Emily Morris	Office of the Solicitor, Washington D.C.

5.3 List of Agencies and Persons Consulted

Ashenhurst Corporation, Connie Wray, Christy Nielsen, and Karen Cantrell	Landowner
Great Northern Properties L.P., George Luther	Landowner Representative
Westmorland Coal Company, Bob Montgomery	Director of Regulatory Affairs
Charles Sullivan	U.S. Fish and Wildlife Service
Mark Baumler/Stan Wilmoth	State Historic Preservation Office
Northern Cheyenne Tribal Council	
Northern Cheyenne Tribal Historic Preservation Officer	
Crow Tribal Council	
Fort Peck Tribes	
Lower Brule Sioux Tribe	
Rosebud Sioux Tribe	
Pine Ridge Sioux	
Cheyenne River Sioux	
Eastern Shoshone Tribe	
Standing Rock Sioux	
Northern Arapahoe Tribe	
Blackfeet Tribe	
Fort Belknap Indian Community Council	
Chippewa-Cree Tribe of the Rocky Boy's Reservation	
Montana Preservation Alliance	
National Trust for Historic Preservation	

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APPENDIX A

Possible Mining Scenario for the Ashenhurst Tracts

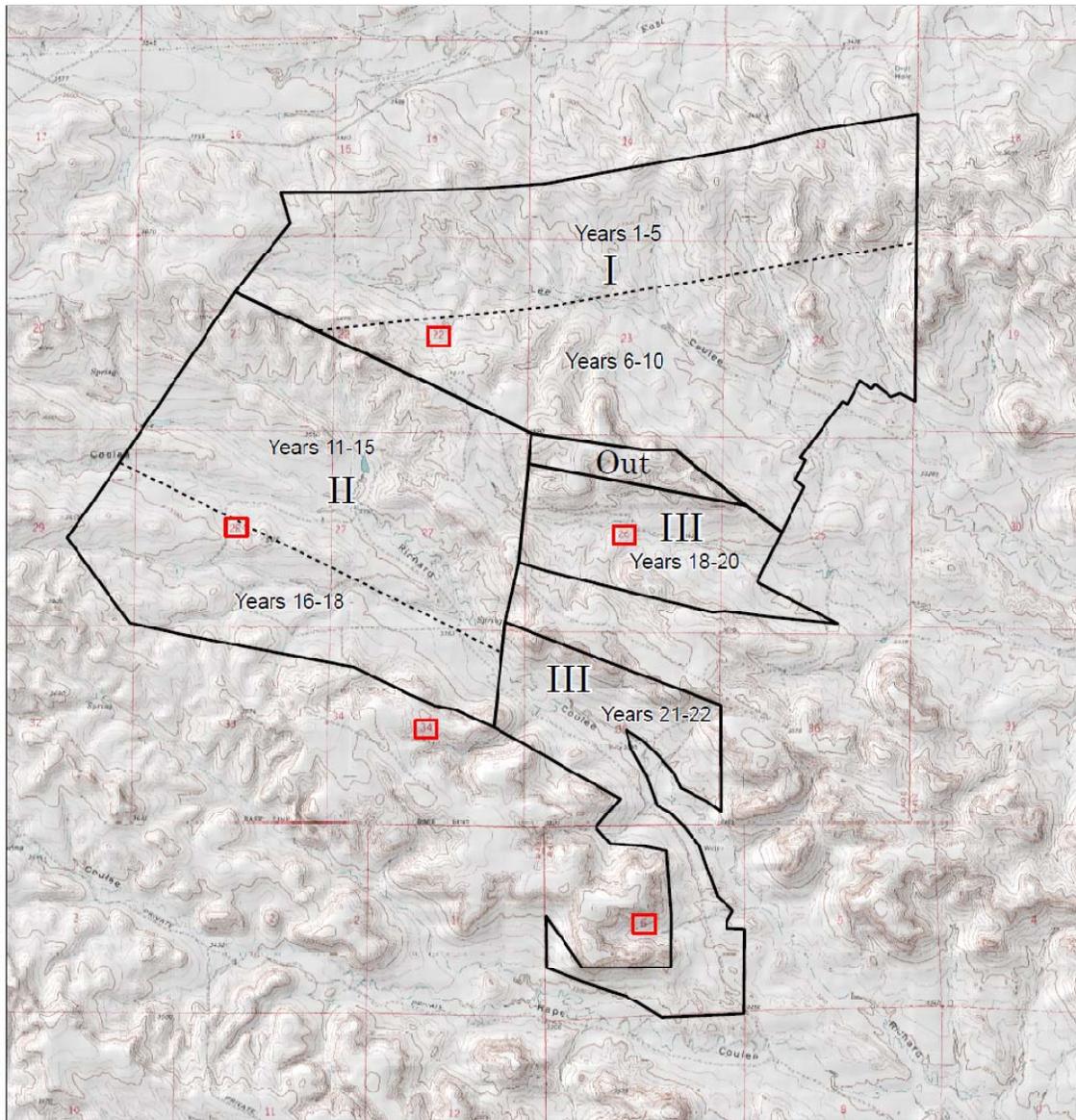
The Ashenhurst Tract is located in an area surrounded by coal mining activity southwest of Colstrip in Rosebud County, Montana. The tracts are located immediately south of Area C South of the Rosebud Mine operated by Western Energy Company and west of Area B of the Big Sky Mine which was operated by the Big Sky Coal Company. Area C South is an active mining area of the Rosebud Mine. Area B of the Big Sky Mine last produced coal in 2003 and is undergoing final reclamation. The Ashenhurst Tract is a part of a checkerboard coal reserve consisting of private and federal coal in and around Lee Coulee and Richard Coulee. The tracts being considered for exchange contain approximately 81.4 million tons of coal. The reserve area consists of about 101.7 million tons of privately-owned coal, about 33.0 million tons of federal coal in sections not included in the Ashenhurst Tract, and about 1.6 million tons of State coal. The Ashenhurst Reserve has been determined to contain approximately 217.7 million tons of recoverable coal at an average stripping ratio of about 6:1 (BCY:Ton). The coal resource of the Ashenhurst Reserve is based upon the Rosebud coal seam. The Rosebud coal seam thickness runs from 26 feet down to 16 feet over the reserve area. It is thinnest and separates in two or more benches in the southernmost reaches of the reserve around the mouth of Richard Coulee. Overburden depths vary from lows of 50-100 feet in the coulee bottoms to over 300 feet beneath the ridges separating the coulees. Rosebud coal seam quality is expected to be consistent with production from the Rosebud and Big Sky Mines; which is 8,600-8,700 BTU/lb, 0.75 to 1.0% Sulfur. This preliminary reserve estimated is based upon work contained in the Coal Resource Occurrence Study conducted by the Colorado School of Mines for the USGS in 1979.

At this time, if Alternative A is ultimately selected, it is unknown which or how much of the of the federal coal underlying the Ashenhurst Tract will be required to equal the appraised value of the 3,379.55 acres of private coal in the alluvial valley floor of the Tongue River owned by Nance-Brown. For the purpose of identifying possible environmental effects, a mining scenario in which all of the Ashenhurst Tract would be mined has been developed. The Ashenhurst Reserve of coal is logically positioned to be a southward extension of Area C South of the Rosebud Mine. The northeast corner of Section 22, of T. 1 N., R. 40 E. one of the tracts proposed for exchange, is only 2.75 miles from the head of the Area C conveyor that transports coal from to the Colstrip power plants.

This possible mining scenario is based on currently available the coal reserves, geological features, surrounding coal development, and applicable state and federal law, primarily SMCRA and its regulations as implement by MDEQ.

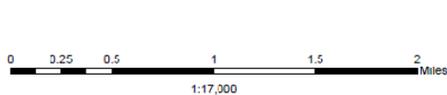
In this scenario, Western Energy, a subsidiary of Westmoreland Coal Company, continues mining though its currently approved mining plan in Area C South, and enters onto the northern portion of the Ashenhurst Reserve located in the south halves of Sections 16, 15, 14, and 13 of T. 1 N., R. 40 E. (See Attached Figure). Existing Rosebud Mine equipment and transportation links will be used. Mining of the Ashenhurst Reserve is expected to begin around the year 2020 at a rate of 10 million tons per year to supplant production from mined out areas of the Rosebud Mine for an additional 20 years. The current Area C South 3.5 mile long pit will continue to be advanced to the south for approximately 10 years until the high ridge which separates Lee Coulee from Richard Coulee is encountered. The deep cover (+300 feet) on the east half of the pit will necessitate it to be shortened to about 2 miles in length. The pit will advance to the south

for about another 8 years in this fashion. Additional reserves south of the high ridge that separates Lee Coulee from Richard Coulee and along the mouth of Richard Coulee would then be mined for another 2 years of mining at 10 million tons per year.



No warranty is made by the BLM as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

April 12, 2010



Projected coordinate system name: NAD_1983_Albers
 Geographic coordinate system name: GCS_North_America_1983
 Datum: North American 1983
 Spheroid: GRS 1980
 Standard Parallel: 43.000000
 Standard Parallel: 48.000000
 Longitude of Central Meridian: -106.000000
 Latitude of Projection Origin: 32.000000
 False Easting: 0.000000
 False Northing: 0.000000



Bureau of Land Management
 Montana State Office
 Billings, Montana

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R 40 E

R 41 E

APPENDIX B

PROPOSED ACTION

MTM-99236

NANCE-BROWN AVF COAL EXCHANGE

DESCRIPTION OF NON-FEDERAL AVF COAL LANDS

The following described non-Federal Alluvial Valley Floor (AVF) coal in Rosebud County, Montana is being considered for exchange from Nance-Brown to the United States in the Nance-Brown AVF Coal Exchange proposal:

<u>Principal Meridian Montana, (Rosebud County, Montana)</u>	<u>Acres</u>
T. 4 S., R. 43 E., sec. 23, Lot 2	18.66
SE $\frac{1}{4}$ SE $\frac{1}{4}$	40.00
sec. 24, Lot 2	21.00
Lot 3	27.31
Lot 4	37.99
S $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$	160.00
sec. 25, W $\frac{1}{2}$ NW $\frac{1}{4}$	80.00
sec. 26, NE $\frac{1}{4}$, E $\frac{1}{2}$ W $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$	480.00
sec. 27, Lot 1	22.03
sec. 33, Lot 1	35.26
sec. 34, S $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$	320.00
sec. 35, W $\frac{1}{2}$ NW $\frac{1}{4}$	80.00
T. 5 S., R. 42 E., sec. 25, Lot 5	33.14
E $\frac{1}{2}$ E $\frac{1}{2}$	160.00
sec. 35, E $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$	400.00
T. 5 S., R.43 E., sec. 3, Lot 3	39.82
Lot 4	39.76
sec. 9, NW $\frac{1}{4}$ NE $\frac{1}{4}$,NE $\frac{1}{4}$ SW $\frac{1}{4}$	80.00
T. 6 S., R. 42 E., sec. 1, SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$	160.00
sec. 12, E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$	320.00
sec. 13, NE $\frac{1}{4}$ NE $\frac{1}{4}$	40.00
T. 6 S., R. 43 E., sec. 6, Lot 2	41.17
Lot 3	41.15
Lot 4	34.97
Lot 5	34.04

	Lot 6	34.06
	Lot 7	34.09
	SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$	120.00
sec. 7,	Lot 1	34.11
	Lot 2	34.14
	Lot 3	34.16
	Lot 4	34.19
	E $\frac{1}{2}$ W $\frac{1}{2}$	160.00
sec. 18,	Lot 1	34.22
	Lot 2	34.28
	NW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$	80.00

Consisting of Approximately \pm 3,379.55 acres

MTM-99236

**NANCE-BROWN AVF COAL EXCHANGE
DESCRIPTION OF FEDERAL COAL LANDS**

In exchange, the BLM would transfer title to federal coal of equal value, as determined by appraisal and in accordance with the procedures found in 43 CFR 2201.6, from the following described pool of federal coal:

Ashenhurst Tract

Principal Meridian Montana, (Rosebud County, Montana)

Acres

T. 1 N., R. 40 E.,	
sec. 22, all	640.00
sec. 26, all	640.00
sec. 28, all	640.00
sec. 34, Lot 1	39.36
Lot 2	39.35
Lot 3	39.35
Lot 4	39.34
N $\frac{1}{2}$, N $\frac{1}{2}$ S $\frac{1}{2}$	480.00
T. 1 S., R. 41 E.,	
sec. 6, Lot 1	38.78
Lot 2	39.14
Lot 3	39.50
Lot 4	35.11
Lot 5	34.95
Lot 6	34.65
Lot 7	34.35
S $\frac{1}{2}$ NE $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$	360.00

Consisting of Approximately **3,173.88 acres**

APPENDIX C

Sensitive Species

Species	USFWS Status	BLM Sensitive	In Range	Habitat present
Mammals				
Black-footed ferret	Endangered	Yes	No	
Black-tailed prairie dog	None	Yes	Yes	No
Swift fox	None	Yes	Yes	No
Fisher	None	Yes	No	
Meadow Jumping Mouse	None	Yes	Yes	Yes
Great Basin Pocket Mouse	None	Yes	No	
Gray Wolf	None	Yes	No	
North American Wolverine	None	Yes	No	
Grizzly bear	Threatened	Yes	No	
Pygmy rabbit	None	Yes	No	
Long-legged Myotis	None	Yes	Yes	Yes
Long-eared Myotis	None	Yes	Yes	Yes
Fringed Myotis	None	Yes	No	
Fringe-tailed Myotis	None	Yes	No	
Pallid bat	None	Yes	No	
Northern Myotis	None	Yes	No	
Townsend's big-eared bat	None	Yes	Yes	Yes
White-tailed prairie dog	None	Yes	No	
Woodland caribou	None	Yes	No	
Birds				
Common loon	None	Yes	Yes	No
Franklin's gull	None	Yes	Yes	No
Interior least tern	Endangered	Yes	Yes	No
Black tern	None	Yes	Yes	No
White-faced ibis	None	Yes	Yes	No
Whooping crane	Endangered	Yes	Yes	No
Yellow rail	None	Yes	Yes	No
Piping plover	Threatened	Yes	Yes	No
Mountain plover	Proposed	Yes	Yes	No
Marbled godwit	BCC	Yes	Yes	Yes
Long-billed curlew	BCC	Yes	Yes	Yes
Bobolink	None	Yes	Yes	No
Great Gray owl	None	Yes	No	
Three-toed woodpecker	None	Yes	No	
Trumpeter Swan	None	Yes	No	
Greater sage-grouse	None	Yes	Yes	Yes
Burrowing owl	BCC	Yes	Yes	Yes
Flammulated owl	none	Yes	No	
Bald eagle	BCC	Yes	Yes	Yes
Golden eagle	None	Yes	Yes	Yes
Ferruginous hawk	None	Yes	Yes	Yes

Species	USFWS Status	BLM Sensitive	In Range	Habitat present
Swainson's hawk	None	Yes	Yes	Yes
Peregrine falcon	None	Yes	Yes	unlikely
Northern goshawk	None	Yes	Yes	possible
Sage thrasher	BCC	Yes	Yes	Yes
Sprague's pipit	BCC	Yes	Yes	Yes
Sedge wren	None	Yes	Yes	No
Loggerhead shrike	BCC	Yes	Yes	Yes
Chestnut-collared longspur	BCC	Yes	Yes	Yes
McCown's longspur	BCC	Yes	Yes	Yes
Baird's sparrow	BCC	Yes	Yes	Yes
Brewer's sparrow	BCC	Yes	Yes	Yes
LeConte's sparrow	None	Yes	Yes	Yes
Nelson's Sharp-tailed sparrow	None	Yes	Yes	No
Horned grebe	BCC	No	Yes	No
American bittern	BCC	No	Yes	No
Prairie falcon	BCC	No	Yes	Yes
Upland sandpiper	BCC	No	Yes	Yes
Black-billed Cuckoo	BCC	No	Yes	Yes
Short-eared owl	BCC	Yes	Yes	Yes
Lewis's woodpecker	BCC	Yes	Yes	Yes
Red-headed woodpecker	BCC	No	Yes	Yes
Black-crowned night heron	None	Yes	Yes	No
Black-backed woodpecker	None	Yes	Yes	possible
Sage sparrow	BCC	Yes	Yes	No
Grasshopper sparrow	BCC	Yes	Yes	Yes
Dickcissel	BCC	Yes	Yes	possible
Blue-gray natcheater	none	Yes	No	
Harlequin duck	none	Yes	No	
Amphibians				
Great Plains toad	None	Yes	Yes	Yes
Northern leopard frog	None	Yes	Yes	Yes
Plains spadefoot toad	None	Yes	Yes	Yes
Reptiles				
Snapping turtle	None	Sensitive	Yes	No
Spiny softshell	None	Sensitive	Yes	No
Greater short-horned lizard	None	Sensitive	Yes	Yes
Milk snake	None	Sensitive	Yes	Yes
Western hog-nosed snake	None	Sensitive	Yes	Yes
Fish				
Sauger	None	Sensitive	Yes	Possible

Sources: Skarr 2003; Werner, Maxell, Hendricks, and Flathl. 2004; Foresman 2001; MTNHP, 2010, MFWP 2010.

APPENDIX D

Previously Recorded Cultural Properties

Site Number	Site Type	NRHP Determination
24RB0333/1923	Historic Homestead	Not Evaluated
24RB0393/1913	Historic Homestead	Not Evaluated
24RB1912	Historic Homestead	Not Evaluated
24RB1915	Historic Homestead	Not Evaluated
24RB1916	Historic Homestead	Not Evaluated
24RB2053	Historic District	Eligible
24RB2281	Petroglyph	Eligible
24RB2282	Lithic Scatter	Not Eligible

Newly Recorded Cultural Properties

Field Number	Site Type	Age	NRHP Recommendation
10-232-22S1	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-22S5	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-22S7	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-22S8	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-22S9	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-22S10	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-22S11	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-22S12	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-26S1	Procurement Area	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S4	Procurement Area	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S5	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S6	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S8	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-26S10	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S13	Procurement Area	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S14	Rock Art	Prehistoric	Eligible Criterion D
10-232-26S17	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-26S18	Procurement Area	Prehistoric	Eligible Criterion D
10-232-26S19	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S20	Lithic Scatter	Prehistoric	Not Eligible No Further Work

			Recommended
Field Number	Site Type	Age	NRHP Recommendation
10-232-26S21	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-26S22	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-28S1	Lithic Scatter w/ Glass	Prehistoric/Historic	Eligible Criterion D
10-232-28S3	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-28S4	Homestead	Historic	Contributing
10-232-28S5	Trash Scatter/Lithic Scatter	Prehistoric/Historic	Contributing
10-232-28S7	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-28S9	Homestead	Historic	Contributing
10-232-34S1	Cairn	Prehistoric	Eligible Criterion D
10-232-34S2	Cairn	Prehistoric	Eligible Criterion D
10-232-34S3	Cairn	Prehistoric	Eligible Criterion D
10-232-34S4	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-34S6	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-34S7	Stone Circle	Prehistoric	Eligible Criterion D
10-232-34S11	Lithic Scatter	Prehistoric	Not Eligible No Further Work Recommended
10-232-6S1	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S2	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S3	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S4	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S5/24RB2281	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S6	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S9	Lithic Scatter w/ Historic Rock Art	Prehistoric/Historic	Eligible Criterion D
10-232-6S10	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S12	Lithic Scatter w/ Rock Art	Prehistoric	Eligible Criterion B/D
10-232-6S13	Lithic Scatter	Prehistoric	Eligible Criterion D

APPENDIX E

**MTM-99236
NANCE-BROWN AVF COAL EXCHANGE
RESERVATIONS AND EXCEPTIONS TO WHICH FEDERAL COAL WILL BE
CONVEYED**

Coal Patent will contain the following Reservation of all minerals other than Coal

The Patent will be for Federal coal only and will contain a reservation of minerals, other than coal, and the right to explore for, drill for, mine, extract, remove and dispose of all minerals owned by, acquired by, or otherwise to vest in the United States, including without limitation, necessary access and exit rights for the right to build and maintain necessary improvements thereupon for the full enjoyment thereof. Unless otherwise provided by separate agreement with the surface owner, permittees, licensees and lessees of the United States shall reclaim disturbed areas to the extent prescribed by applicable regulations.

All causes of action brought to enforce the rights of the surface owner under the regulations above referred to shall be instituted against permittees and lessees of the United States; and the United States shall not be liable for the acts or omissions of its permittees and lessees.

The Patent would be subject to existing rights such as oil and gas leases and coal exploration licenses, if any.

Conveyance of the Federal coal will occur with the issuance of a single patent. The BLM will not provide any form of title insurance associated with the conveyance.

Field Number	Site Type	Age	NRHP Recommendation
10-232-6S14	Homestead	Historic	Not Eligible No Further Work Recommended
10-232-6S16	Lithic Scatter	Prehistoric	Eligible Criterion D
10-232-6S18	Rock Art	Prehistoric	Eligible Criterion D
10-232-6S19	Lithic Scatter	Prehistoric	Eligible Criterion D