

MTM 107885

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BUREAU LAND MANAGEMENT

COAL EXPLORATION LICENSE APPLICATION

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MONTANA STATE OFFICE
BILLINGS, MONTANA

AE COAL, LLC

**OFF-LEASE
FEDERAL COAL**

Decker Exploration Area

Pursuant to:

**BLM COAL MANAGEMENT REGULATIONS
Title 43, Chapter 2
Part 3410 - Exploration licenses**

October 21, 2014

**Coal Exploration License Application
Off-Lease Federal Coal
Decker Exploration Area
AE Coal, LLC
October 21, 2014**

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1.0 APPLICANT DATA

Applicant

Mr. Jason Russell
Manager Geological Services
AE Coal, LLC
170 South Main Street, Suite 700
Salt Lake City, UT 84101
(801) 539-3788

Person Present & Responsible for Work

Mr. Jeremy Kerly, P.G.
Senior Exploration Geologist
AE Coal, LLC
170 South Main Street, Suite 700
Salt Lake City, UT 84101
(801) 201-3178

If above parties are unavailable, please contact

Mr. Jordan Sweeney
Environmental Manager
AE Coal, LLC
170 South Main Street, Suite 700
Salt Lake City, UT 84101
(801) 712-7571

2.0 PROPERTY DATA

2.1 Listing of Affected Lands

Refer to Table 1 – Legal Description of Areas Covered Under the Application.

2.2 Names and Addresses of Surface Owners of Record

Decker Coal Company currently has surface owner control and/or the right of entry to large blocks of land within and adjacent to East and West Decker Mines. If not currently existing, the appropriate right of entry will be obtained from all surface owners prior to entry upon the applicable land. Table 2 provides additional detail on surface owners.

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Arrowhead I LLC
c/o Cloud Peak Energy
505 South Gillette Avenue
Gillette, WY 82716

Decker Coal Company
P.O. Box 12
Decker, MT 59025

State of Montana
Department of Natural Resources & Conservation
Trust Land Management Division
1625 11th Avenue
Helena, MT 59620

Visborg, Deanna L.
208 Crescent Drive
Sheridan, WY 82801

United States of America
U.S. Department of Interior
c/o Bureau of Land Management
5001 Southgate Drive
P.O. Box 36800
Billings, MT 59107-6800

3.0 MINERAL PROPERTY DATA

United States of America
U.S. Department of Interior
c/o Bureau of Land Management
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4.0 SITE DESCRIPTION

4.1 Area of Exploration

The Federal coal lands to be explored are located adjacent to the existing East and West Decker Coal Mines which encompass Federal Coal leases MTM-54716, MTM-37604, MTM-061685, MTM-57934A, MTM-67019 and MTM-37604; in addition to Montana State Coal Leases and several Fee Coal tracts leased by Decker Coal. The exploration area covered under this application is provided in Table 1 – Legal Description of Area Covered Under the Application and Drawing 1.

4.2 Land Use

End use of the area within and adjacent to the Decker Coal Mine has been rangeland. It is used primarily for cattle and horses; however, game animals such as deer and antelope still regularly graze the forage. The principal use of reclaimed lands will be for grazing of cattle, horses and wildlife such as antelope, grouse and deer.

4.3 Climate

The climate at the Decker Coal Mine area can be characterized as a semi-arid interior continental climate with local variations due to topography. Average annual precipitation is approximately 12 inches. Most of the precipitation is received in the spring in the form of rain; however, winter snowfalls average 19 inches per year. Air temperatures vary greatly throughout the year from a monthly average maximum of 89° F in July to a monthly average minimum of -2° F in January.

4.4 Regional Geology

The exploration area is located along the western edge of the Powder River Basin, a large regional northwest-southeast trending synclinorium approximately 100 miles long and 50 miles wide. It is flanked by the Big Horn Mountains to the west, the Laramie Mountains and Hartville uplift to the south and southwest, the Black Hills to the east, and the Miles City Arch to the north.

The Powder River Basin contains up to about 18,000 feet of Paleozoic, Mesozoic and Cenozoic rocks overlying a pre-Cambrian basement. These rocks were deposited during several periods of basin subsidence and marine inundation. The sea retreated permanently from the basin during the late Cretaceous period. During the Paleocene, the Laramie Mountains, Big Horn Mountains and the Black Hills began to rise. Most of the sediments from these

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high areas were deposited in the Powder River Basin. The depositional environment consisted of near sea level flood plains, sloughs, and swamps inland of the open sea to the east and northeast. The climate was warm to temperate. Through the Paleocene and Eocene, the Powder River Basin subsided intermittently with continued periods of subsidence followed by periods of stability resulting in the accumulation of several thousand feet of interbedded sands, silts, clays and coal deposited in a near sea level environment.

Near the end of the Eocene, there was renewed uplift in the Black Hills, and the Powder River Basin was tilted toward the west. During this period the streams flowed generally to the southwest. The area then stabilized and a mature topography began to develop. During the Oligocene and Miocene, extensive volcanism to the west provided a source for thick accumulations of tuffaceous sediments that extended over much of the Powder River Basin and covered all but the highest mountain ranges.

A major regional uplift in the late Pliocene resulted in extensive normal faulting and renewed incision of the streams in the Powder River Basin. Erosion has continued through recent time with the north-northwest trending drainages in the Powder River Basin, continuing their downcutting and resulting in the present relief of the area.

4.5 Site Geology

The area to be explored is underlain by the Paleocene Tongue River Member of the Fort Union Formation consisting of sandstone, clinkers, shale and subbituminous coal seams. Alluvial fans and the colluvial-covered slopes occupy the most significant portion of the site. With the exception of minor folding, the area is undeformed and significant faults are not known to exist.

4.6 Hydrology

The exploration area lies within the Tongue River watershed. Surface water features are indicated on the enclosed topographic map.

4.7 Vegetation

Vegetation in the area surrounding the Decker Coal Mine is primarily big sagebrush with mixed grass understory. Some small stands of ponderosa pine with mixed understory of grasses and/or shrubs may be present within the exploration area.

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4.8 Soils

The major soils in the area and surrounding environs are primarily classified in two associations of great groups. The first is an association of Haplargids, Natrargids and Torriorthents formed on nearly level, to rolling upland plains. The second is a shallow association of Torriorthents formed on steep uplands from residual materials. A minor Torrifluvents-Haplargids association is present in the alluvial materials along the major drainages in the area. Soil depths in the region range from a few inches or less in some of the steeper upland areas to more than 10 feet in the valley floors of the major drainages.

4.9 Wildlife

Sage grouse and sharp-tailed grouse are both known to be present in the area as are various raptors. The majority of the area, as required by the MDEQ in conjunction with the adjacent coal mining operation, has been surveyed in compliance with state and federal wildlife guidelines for many years. The proposed disturbance will not affect any big game migration routes or winter concentration areas. Some drill holes are near historic raptor nests. If the nests are active, timing restrictions can be utilized to avoid any effect on the raptors.

4.9.1 Threatened or Endangered Species

No known threatened or endangered wildlife resources are present in the area of exploration. There are prairie dog colonies in the area; however, there are no known populations of black-footed ferrets. The closest drill hole to a prairie dog colony is approximately 500 feet. While the black-tailed prairie dog is a Species of Concern in Montana, due to the distance from the drill holes to the colonies there should be no effect on the prairie dogs. Sharp-tailed grouse leks are within approximately one-half mile of drill holes; however, the nearest known sage grouse lek is over one and one-quarter (1¼) miles away from the nearest drill hole. Additional surveys are in the process of being conducted. If any threatened or endangered species are encountered, the BLM will immediately be notified and exploration operations halted until all proper agencies have been notified and a plan agreed upon to move forward.

4.10 Cultural Resources

Cultural resource sites on the permit have been previously identified and some have been mitigated. Field surveys of access routes off the permit will be conducted prior to drilling. Drilling activity will be routed around all cultural resource sites when possible.

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5.0 DESCRIPTION OF EXPLORATION ACTIVITIES

5.1 Methods of Exploration

The following narrative is a typical, but certainly not an all-inclusive, description of methods utilized to conduct coal exploration, reclamation and abandonment procedures under this application. A rotary drill rig similar to a Midway 1500, one water truck, a crew truck and either cargo trailer or water trailer, a 4-wheel drive crew/geologist pickup truck and a Geophysicist truck will be required to drill each site. A backhoe or tractor may be used for site preparation and reclamation.

Access routes and/or road construction will vary depending on the proposed drill site. Due to rough terrain in some locations, a small number of sites may require limited road construction; however, for the most part existing ranch type roads will be utilized with some travel over relatively flat terrain. Access to drill sites will be limited where possible to times of no danger to soil compaction and efforts will be made to minimize vegetative impacts. Minor disturbance impacts on the sagebrush grassland habitat will be mitigated by tilling and seeding with the MDEQ approved vegetation species mix presented in **Section 5.2** below. Please refer to the Figure for road locations.

5.2 Excavated Earth Disposal

Stockpiling and reclamation procedures will conform to those specified by the Montana Department of Environmental Quality. Debris disposal areas (i.e. “mud pits”) will be constructed at each drill site during the exploration program in order to minimize surface impacts. Each mud pit will be constructed to approximate dimensions below:

Length: 8’ x Width: 4’ x Depth: 3’

A maximum of two mud pits will be constructed at each drill site allowing for the suitable collection and disposal of drilling slurry and cuttings. Upon reclamation, the mud pit disturbance areas will be returned to the original contour. Root growth material (topsoil) will be stockpiled at the end of each mud pit and used in the reclamation process to facilitate vegetation growth. The limits of disturbance will be tilled and seeded at a rate of 30-35 bulk pounds per acre with the following approved seed mix:

Western wheatgrass	Thickspike wheatgrass
Slender wheatgrass	Sainfoin

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5.3 Method of Drillhole Reclamation

Reclamation procedures will conform to those specified by the Montana Department of Environmental Quality and Decker Coal Company Permit No. 87001C. Drill holes to be mined through within one year will have a surface protection device installed over the borehole; i.e. a witch's hat, a large rock or equivalent. Drill holes to be mined through after a one-year period without a loss of circulation will be backfilled from the bottom with a swelling bentonitic clay grout containing no less than 50% bentonite solids per unit volume to within two feet of the land surface. Drill holes to be mined through after a one-year period with a loss of circulation to the formation or artesian conditions will be slurried with a homogeneous cement grout mixture to within in two feet of the land surface. Precautions will be taken to ensure bridging does not occur and a magnetic marker will be placed on top of the bentonite or cement grout for future signature reference. From that point to the native surface, root growth material (topsoil) will be used as backfill. Surface disturbance will be returned to the original contour and will be tilled and seeded at a rate of 30-35 bulk pounds per acre with the approved seed mixture as described in **Section 5.2** above.

5.4 Size and Depth of Holes

The estimated size of the drill holes is 3 7/8 inch (rotary drilling) and 5 1/8" (core drilling). The estimated depth of the drill holes ranges from approximately 150 feet to 400 feet. Trenches and test pits will not be utilized during this operation. Prior to core drilling at each drill site, a small diameter preliminary rotary hole is proposed to evaluate the geological conditions present. All preliminary rotary holes will be abandoned as described in **Section 5.3**.

5.5 Transfer of Holes to Monitoring Sites or Water Wells

Several of the proposed exploration holes may be converted to groundwater monitoring sites or water wells. Prior to completion of drilling, the BLM will be notified as to which holes may be completed as monitoring sites.

6.0 TIMETABLE FOR EACH PHASE OF OPERATION

Drilling activity is scheduled to begin as soon as this plan is approved and will be completed no longer than two years following issuance of the Exploration License, excluding periods of temporary cessation of operations due to wildlife restrictions set forth by the BLM.

Reclamation of holes drilled will commence after each hole is logged. Seeding of

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disturbed sites and any off road travel routes will be conducted prior to April 15th or after October 15th of each year. Planting of native species after the latter date is preferable due to early growth susceptibility to frost kill.

Drillhole locations, corresponding hole number, and specific information relative to each site are included as Table 2 and Table 3.

7.0 COAL REMOVED DURING EXPLORATION

The amount of coal to be removed during this exploration project is estimated to be approximately 4.1 tons. Coal removed will be used for laboratory analysis to determine quality parameters. This estimation was based on the following method:

$$\begin{aligned} A &= \text{Amount of Coal Removed} \\ A &= 3.1416 * (d/2)^2 * T * E * N \\ D &= \text{Hole Diameter} = 5 \text{ } 1/8'' = .4271' \\ T &= \text{Seam Thickness} = 70' \\ E &= \text{Coal Density} = .0409 \text{ ton/ft.}^3 \\ N &= \text{Number of Core Holes} = 10 \end{aligned}$$

8.0 ASSURANCE OF PERFORMANCE STANDARD COMPLIANCE

The enclosed map shows areas to be affected by proposed exploration and reclamation. The map depicts existing roads, proposed access routes and drilling locations, locations of surface water and occupied dwellings (if any exist). All sites will be field located and verified along with access routes to each site prior to commencement of drilling activities. The applicant understands that archaeological and wildlife clearance from BLM will be required prior to commencement of drilling but after field location of all sites and access routes. If any acid forming or toxic materials are encountered during the exploration process, the materials will be disposed of properly. All equipment will be promptly removed from the exploration area after completion of the project unless specific prior permission is granted from the surface owner. All records will be retained for at least one year for inspection and analysis if requested by BLM.

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Table 1 - Legal Description of Areas Covered Under the Application				
Township	Range	Section	Description	Acres
8S	40E	27	W $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$	90.00
8S	40E	28	S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$	480.00
8S	40E	29	S $\frac{1}{2}$	320.00
8S	40E	32	SW $\frac{1}{4}$	160.00
8S	40E	34	W $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$	50.00
9S	39E	12	Lots 1 thru 4, W $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$	639.56
9S	39E	13	Lots 1 thru 4, W $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$	640.56
9S	39E	14	All	640.00
9S	39E	23	All	640.00
9S	39E	24	Lots 1 thru 4, W $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$	642.76
9S	39E	25	Lots 1 thru 4, W $\frac{1}{2}$ E $\frac{1}{2}$, W $\frac{1}{2}$	643.60
9S	39E	26	All	640.00
9S	40E	2	Lots 1 and 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, SW$\frac{1}{4}$NW$\frac{1}{4}$ ^{SE$\frac{1}{4}$} , E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$	440.49
9S	40E	4	Lot 4, SW $\frac{1}{4}$ NW $\frac{1}{4}$	80.24
9S	40E	5	Lots 1 thru 4, S $\frac{1}{2}$ N $\frac{1}{2}$, SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$	600.64
9S	40E	7	Lots 1 thru 4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	629.32
9S	40E	8	NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$	270.00
9S	40E	11	N $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$	120.00
9S	40E	17	W $\frac{1}{2}$ SW $\frac{1}{4}$	80.00
9S	40E	18	Lots 1 thru 4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	630.00
9S	40E	19	Lots 1 thru 3, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	592.84
9S	40E	20	W $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$	480.00
9S	40E	23	E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$	600.00
9S	40E	24	All	640.00

PER Jordan
Sweeney
10/28/14
CJW

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Table 1 - Legal Description of Areas Covered Under the Application				
Township	Range	Section	Description	Acres
9S	40E	25	N½, SW¼	480.00
9S	40E	26	All	640.00
9S	40E	29	NE¼, N½SW¼, SW¼SW¼, N½SE¼	360.00
9S	40E	30	Lots 2 thru 4, E½SW¼, SE¼	353.32
9S	41E	19	Lot 5	34.78
Total				12,618.11

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Table 2 – Coal Exploration Holes Proposed Under the Application

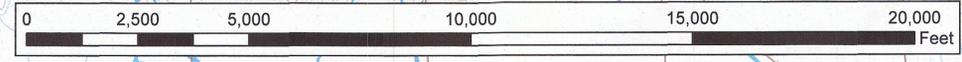
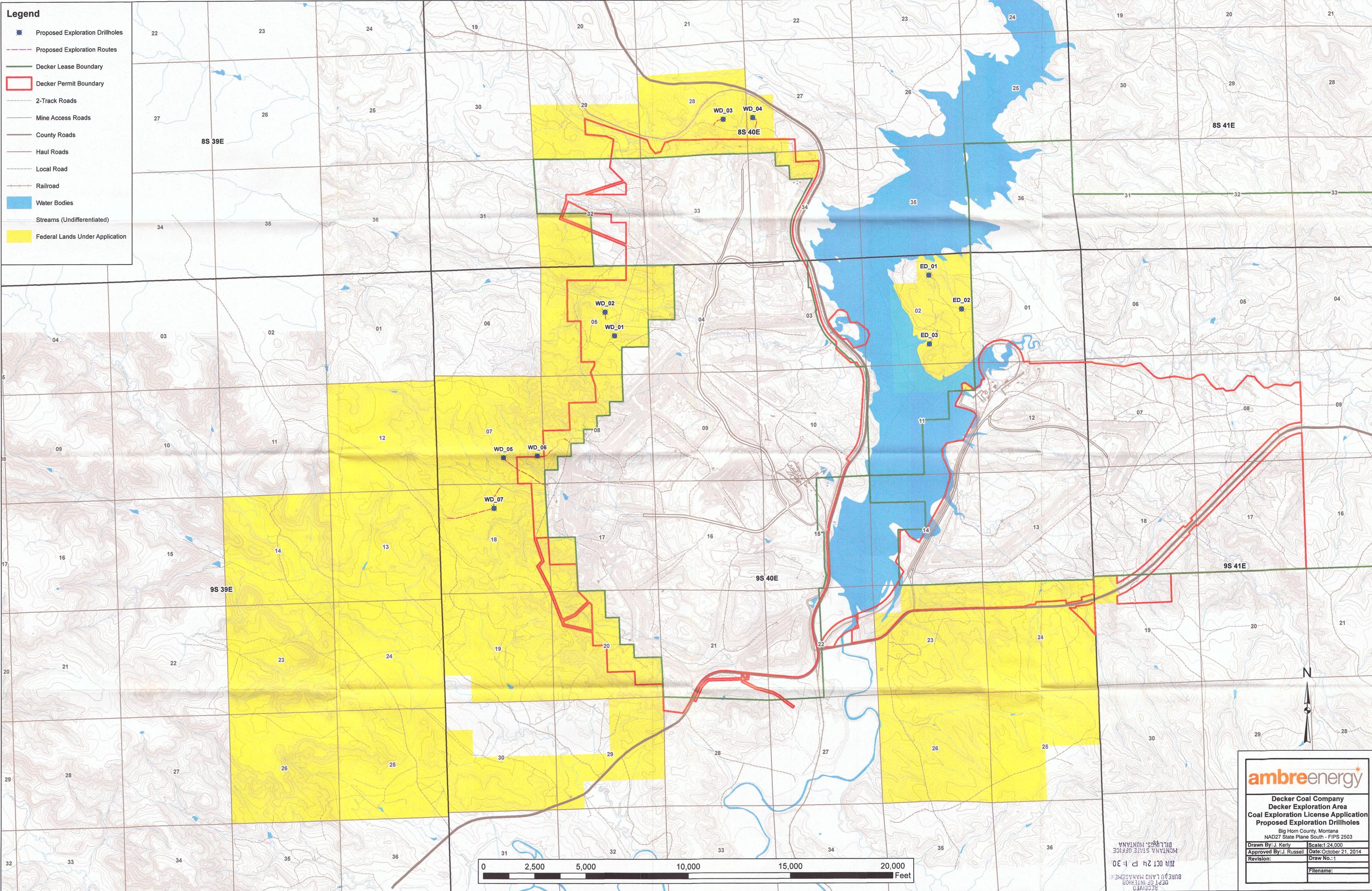
Hole ID	SP NAD27 MT-S, Feet		Twn	Rng	Section	QQ	Surface Owner	Coal Owner	Total Depth, Feet	Elevation, Feet
	Northing	Easting								
ED_01	405,191.11	2,698,791.14	9S	40E	2	NWNE	Decker CC	BLM	150	3,470
ED_02	403,547.61	2,700,390.62	9S	40E	2	NESE	Decker CC	BLM	150	3,540
ED_03	401,876.19	2,698,823.44	9S	40E	2	SWSE	DNRC	BLM	150	3,435
WD_01	402,297.57	2,683,440.19	9S	40E	5	NWSE	Decker CC	BLM	250	3,645
WD_02	403,450.79	2,682,978.86	9S	40E	5	SWNE	Decker CC	BLM	250	3,622
WD_03	412,759.15	2,688,761.72	8S	40E	28	NESE	Decker CC	BLM	250	3,615
WD_04	412,843.74	2,690,198.79	8S	40E	27	NWSW	Decker CC	BLM	250	3,595
WD_05	396,406.81	2,678,020.40	9S	40E	7	SWSE	BLM	BLM	400	3,823
WD_06	396,492.32	2,679,670.70	9S	40E	7	NESE	BLM	BLM	400	3,755
WD_07	393,955.98	2,677,557.97	9S	40E	18	NWNE	Arrowhead I, LLC	BLM	400	3,770

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Table 3 – Alternate Coordinate Information						
Hole ID	SP NAD27 MT-S, Feet		SP NAD83 MT, Feet		NAD83 UTM Z13N, Meters	
	Northing	Easting	Northing	Easting	Northing	Easting
ED_01	405,191.11	2,698,791.14	314,357.49	2,667,261.42	4,993,286.40	358,768.52
ED_02	403,547.61	2,700,390.62	312,715.23	2,668,862.14	4,992,759.04	359,227.21
ED_03	401,876.19	2,698,823.44	311,042.58	2,667,296.33	4,992,277.14	358,721.87
WD_01	402,297.57	2,683,440.19	311,452.05	2,651,913.22	4,992,667.46	354,048.19
WD_02	403,450.79	2,682,978.86	312,604.92	2,651,451.02	4,993,026.24	353,927.46
WD_03	412,759.15	2,688,761.72	321,917.73	2,657,226.49	4,995,760.21	355,845.70
WD_04	412,843.74	2,690,198.79	322,003.43	2,658,663.43	4,995,761.46	356,284.42
WD_05	396,406.81	2,678,020.40	305,557.11	2,646,498.09	4,990,967.24	352,298.67
WD_06	396,492.32	2,679,670.70	305,643.87	2,648,148.28	4,990,965.15	352,802.29
WD_07	393,955.98	2,677,557.97	303,105.89	2,646,037.53	4,990,229.33	352,116.21

Legend

-  Proposed Exploration Drillholes
-  Proposed Exploration Routes
-  Decker Lease Boundary
-  Decker Permit Boundary
-  2-Track Roads
-  Mine Access Roads
-  County Roads
-  Haul Roads
-  Local Road
-  Railroad
-  Water Bodies
-  Streams (Undifferentiated)
-  Federal Lands Under Application



Decker Coal Company
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Proposed Exploration Drillholes

Big Horn County, Montana
 NAD27 State Plane South - FIPS 2503

Drawn By: J. Kerly	Scale: 1:24,000
Approved By: J. Russell	Date: October 21, 2014
Revision:	Draw No.: 1
Filename:	

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