USDA

United States Department of Agriculture

Forest Service

United States Department of Interior

Bureau of Land Management

March 2007

Draft Environmental Impact Statement

Deer Creek Shaft and E Seam Methane Drainage Wells Project

Paonia Ranger District, Grand Mesa, Uncompahgre and Gunnison National Forests

Delta and Gunnison Counties, Colorado

Sections 27-29 and 32-34, Township 13 South, Range 90 West and Sections 1-5 and 8-10, Township 14 South, Range 90 West, 6th Principal Meridian.

Deer Creek Shaft and E Seam Methane Drainage Wells Project

Draft Environmental Impact Statement

Gunnison County, Colorado

Lead Agency:	USDA Forest Service
Cooperating Agencies:	USDI Bureau of Land Management
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Abstract: Mountain Coal Company (MCC) needs to have reasonable surface use and access on National Forest System (NFS) lands subject to terms of a federal coal lease for operations associated with constructing, operating and reclaiming methane drainage and ventilation and escapeway facilities in order to efficiently produce federal coal reserves. The purpose of the agency's action is to facilitate production of complaint and super compliant coal reserves, and allow MCC to exercise lease rights and perform operations. The draft environmental impact statement analyzes the effects of two alternatives. Alternative 1 – No Action would not permit the ventilation shaft or methane drainage wells. Alternative 2 – Proposed Action would allow the ventilation shaft and all methane drainage wells, including the 22 within the West Elk Inventoried Roadless Area.

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decision making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978): Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, l986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980): Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

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Date Comments Must Be Received: April 7th, 2007

SUMMARY

Federal coal reserves are currently being mined by Mountain Coal Company (MCC) from their West Elk Mine (**Figure S-1**). MCC presently operates a longwall system of underground mining, which is permitted with the Colorado Division of Reclamation, Mining and Safety (DRMS) for a production rate of 8.2 million tons of coal per year. The West Elk Mine was opened in 1981 and presently produces coal from several existing federal coal leases. The coal mined at the West Elk Mine, as well as from other mines in the North Fork Valley, is a high British Thermal Unit (BTU), low sulfur, low ash, and low mercury coal. The coal meets the Clean Air Act standards for compliant and super-compliant coal. Its use in industry helps meet standards of the Clean Air Act. As such, there is a demand for coal from the West Elk Mine and other mines in the North Fork Valley by electric power generation industries.

In the past 5 years, operations at the West Elk Mine have extracted coal from the B coal seam. Recently, the West Elk Mine incorporated other leased federal coal reserves to their State-approved mine permit, and operations will be moving into unmined reserves in the E coal seam in the next few years. In addition, MCC leased additional E Seam reserves to the southeast of existing operations, which are a logical extension of existing operations with an effective date of March 1, 2007.

Based on experience mining other coal reserves at the West Elk Mine, it is anticipated that underground mining operations will encounter quantities of naturally-occurring methane gas that left unmitigated, will create hazardous working conditions in the underground mine. In order to continue operations to recover leased federal coal reserves, the excess methane must be evacuated from the underground workings to reduce the explosion hazard and maintain gas levels at safe operating conditions. The Mine Safety and Health Administration (MSHA) has requirements that underground coal mines maintain methane concentrations that are one percent or less. The method demonstrated to be most effective in evacuating methane gas from the underground workings is to install vertical methane drainage wells (MDW) from the land surface into the mine workings. In some places, MDWs drilled at and angle (i.e. 'directionally drilled') are also effective. Therefore, the mine has proposed a project to install MDWs into the E Seam mining operations.

Since 2001, the GMUG and the Forest Service Rocky Mountain Regional Office have analyzed and approved several methane drainage projects to continue operations at the West Elk Mine (see section Other Analyses Completed in the Project Area). These project decisions approved about 70 methane drainage well locations and over 20 miles of road construction. Some of these activities have occurred in the West Elk Inventoried Roadless Area (West Elk IRA). Operations and contemporaneous reclamation have been on-going since these approvals were given. Implementation of these previous decisions resulted in field data from the B Seam which may be extrapolated for the E Seam which will assist in this analysis.

In addition, as part of beginning to mine the E seam reserves, the mine plan also calls for an additional ventilation shaft and escapeway (called the Deer Creek shaft) to support the mine ventilation system, and provide for underground worker safety. The access for this shaft has been approved under a previous NEPA decision (2006) for geotechnical work and has already been constructed. Actual construction and operation of the shaft are included in the proposed action.

This environmental impact statement considers the effects of installing MDWs and a ventilation shaft and escapeway to facilitate continued operations to recover leased federal coal reserves.

Figure S-1. Project Location Map

Purpose of and Need for Action

The Forest Service has identified the need to authorize Mountain Coal Company (MCC), operator of the West Elk underground coal mine, to construct, operate, and reclaim up to 137 methane drainage well sites that would support 168 individual MDWs, one ventilation/ escapeway facility, and approximately 23.8 miles of associated roads. The operations are needed for the West Elk Mine to comply with Mine Safety and Health Administration (MSHA) requirements for methane gas management to ensure worker safety. The operations would enable safe recovery of leased federal coal reserves in compliance with lease terms and requirements for efficient recovery of federal coal.

The purpose of the agency's action is to protect public health and safety, to prevent loss of leased federal coal resources, and to facilitate safe and efficient production of compliant and super compliant coal reserves.

This project would contribute to meeting the need for energy resources developed and produced in an environmentally sound manner. The project responds to the goals and objectives outlined in the Amended GMUG Land and Resource Management Plan (GMUG Forest Plan, USDA FS 1991) which calls for encouraging environmentally sound energy and minerals development. By providing for coal leasing and development in this area, the GMUG Forest Plan and Bureau of Land Management's (BLM) Uncompahgre Basin Resource Management Plan (Uncompahgre RMP, USDI BLM 1989) acknowledged that the area could at some future time support surface facilities necessary to support coal production.

The GMUG Forest Plan also identified providing livestock forage, managing big game winter range and protecting riparian habitat as the desired future conditions of the area. The proposed action is designed to be consistent with moving the area towards those desired conditions. The Uncompahgre RMP supports coal leasing and development in the area with respect to management of mineral resources.

Proposed Action in Brief

The Forest Service proposes to authorize MCC to conduct surface operations associated with accessing, drilling, constructing, operating, and reclaiming 168 methane drainage wells on 137 drilling locations, and one ventilation/ escapeway shaft on the National Forest System (NFS) lands described below. Five of the drilling locations would also serve as staging areas. An additional six staging areas may be used, two of are currently reclaimed areas The Forest Service also proposes to authorize construction and use of about 23.8 miles of roads (19 miles of new and 4.8 miles existing) necessary for these operations, which includes a 0.6 re-routing of an existing life of mine access road to address issues related to geologic hazards, sedimentation control and maintenance. Operations related to these authorizations are expected to begin in summer 2007. The proposed action includes granting relief from the lease stipulation on federal coal lease C-1362 that restricts activities between December 1 and April 30 for the protection of big game winter range to facilitate construction of the Deer Creek shaft. Specific details of operations to be conducted under the proposed action are described in Chapter 2.

Location of Proposed Action

The Deer Creek ventilation shaft/escapeway is located in NE¼ Section 32, Township 13 South, Range 90 West, 6th Principal Meridian, in Gunnison County, Colorado (approximately 1,800 feet southeast of Minnesota Reservoir) on federal coal lease C-1362. The proposed E seam methane drainage well development is located in Sections 26-29 and 32-35, Township 13 South, Range 90 West and in Sections 1-5, and 9-11, Township 14 South, Range 90 West, 6th Principal Meridian, in Gunnison County, Colorado (approximately 7 to 10 miles east and northeast of Paonia, Colorado) on federal coal leases C-1362, COC-56447 and COC-67232 (**Figure S-1**).

Summary Description of Proposed Actions in Inventoried Roadless Areas

Portions of the Proposed Action would occur on the federal coal leases[1] that are in the West Elk IRA. Approximately 3.2 miles of road construction (including a 0.6 mile re-route) is proposed on these leases within the IRA. The road construction is necessary for access to 35 sites for methane drainage wells. Seventeen of these sites would be located in the IRA.

Roads associated with accessing methane drainage wells may be constructed or reconstructed in the West Elk IRA under two of the exceptions stated in the Roadless Area Conservation Rule of 2001 (RACR), those being:

- Exception No. 1 – protection of public health and safety in the cases of imminent threat that without intervention would cause loss of life or property, and
- Exception No. 7 – roads are needed for the continuation, extension, renewal of a mineral lease on lands that were under lease as of 1/12/2001.

Additional details regarding the use of these exceptions are given in Chapter 2.

In compliance with the RACR, conditions attached to the Forest Service concurrence to the state permitting action would be consistent with provisions at 36 CFR 294.12 (b) (7) which requires road construction and reconstruction on mineral leases to "be conducted in a manner that minimizes effects on surface resources, prevents unnecessary or unreasonable surface disturbance, and complies with all applicable lease requirements, land and resource management plan direction, regulations, and laws." Also consistent with that provision of RACR, the Forest Service will require the operator to decommission all roads by obliteration when no longer needed for the purposes of the leases. Roads proposed in the IRA would be for project and administrative use only, and would not be available for public use.

[1] Specific information about the individual federal coal leases involved in the project is described in the section, Federal Coal Leases.

Issues

The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…."

Significant Issues

The Forest Service identified the following issues which will be analyzed in detail in the EIS. In most cases, a design criteria has been developed to minimize impacts (see Error! Reference source not found. **of the EIS**), one was used to develop another alternatives (Inventoried Roadless Areas), and the remainders were addressed through impact analysis in Chapter 3.

- Socioeconomic
- Wildlife
- Soils and Geologic Hazards
- Vegetation
- Cultural Resources
- Land Uses, Including Recreation
- Inventoried Roadless Areas
- Roads and Facilities
- Visual Resources
- Livestock Management
- Air Quality

- Water Quality
- Safety/Emergency Response
- Cumulative Impacts

Alternatives Considered in Detail

In addition to the No Action Alternative (Alternative 1) and the Proposed Action (Alternative 2), the Forest Service considered several alternatives in response to issues raised by the interdisciplinary team, national policy changes, and input from other agencies, associations, and the public; however, only the No Action and Proposed Action were carried for detailed analysis.

Alternative 1 - No Action

Under the No Action alternative, current management plans, existing approvals related to coal mining, and non-coal related activities would continue to occur or guide management of the project area. The proposed E Seam methane drainage well project and shaft construction would not be approved. Mining-related surface disturbance would not occur, or would be limited to surface resource monitoring activities such as monitoring wells, surface water monitoring stations, subsidence and related effects, etc. Surface activities related to development of the E Seam methane drainage within the West Elk IRA would not occur. Methane generated during mining operations would be handled through the existing mine ventilation system. The ineffectiveness of handling methane solely through the ventilation system would likely cause underground coal mining operations in the E seam to slow significantly or diminish entirely over time. This could result in a reduced capacity for MCC to meet its coal contractual obligations, create unsafe working conditions, and render the coal reserves uneconomical to recover. Further, there would be a decreased ability to recover currently leased federal coal reserves.

Alternative 2- The Proposed Action

The Forest Service proposes to authorize MCC to conduct surface operations associated with accessing, drilling, constructing, operating, and reclaiming 168 MDWs on 137 drilling locations, and one ventilation/escapeway shaft, and associated road construction or reconstruction. A portion of these activities is proposed in the West Elk IRA. Operations related to these authorizations are expected to begin summer 2007 and continue for about 12 years. Five of the drilling locations would also serve as staging areas. An additional six staging areas may be used, two of are currently reclaimed areas.

The proposed action includes granting relief from the lease stipulation on federal coal lease C-1362 that restricts activities between December 1 and April 30 for the protection of big game winter range to facilitate construction of the Deer Creek shaft.

The Forest Service would issue a SUA for these uses of NFS lands. The SUA would be consistent with the terms of the federal coal leases on which operations are proposed, and would include conditions identified in the environmental analysis and final Forest Service decision on the project.

Specific activities involved in the Proposed Action are given below:

Deer Creek Shaft Includes:

- Constructing a ventilation shaft to create an airshaft 20 to 28 foot diameter by 400 feet deep.
- Constructing an emergency escapeway 4 feet in diameter and 400 feet deep. Constructing an enclosure (20 foot by 30 foot steel-sided shed) for the emergency escapeway and electrical generation equipment for emergency escape hoist.
- Shaft and escapeway would use a previously approved and constructed pad and access road southeast of Minnesota Creek Reservoir (see Error! Reference source not found.).

Figure S-2. Proposed Action

Performing Operations and Maintenance.

- Performing interim reclamation on pad and light-use (low-volume) road once shaft and emergency structures are constructed.
- Sealing airshaft and escapeway with concrete/steel structure 10 feet below ground surface and performing final surface reclamations when no longer needed at end of life of mine (mine life estimated at 13-15 years).

Additionally, due to unknown timing of mining operations, the Proposed Action includes analysis of the most surface disturbing method of shaft construction (conventional methods).

Disturbed area for the shaft is estimated to be 4 acres. Sub-soil stockpile is anticipated to be piled directly east of shafts. The only facilities visible on the surface associated with the ventilation shaft will be the collar and exhaust equipment.

E Seam Methane Drainage Wells (MDW) Includes:

- Drilling and casing of up to 168 MDWs located on up to 137 drill locations over 12 years on NFS lands. Five of the drilling locations would also serve as staging areas. An additional six staging areas may be used, two of are currently reclaimed areas.
- Constructing approximately 19 miles of new access road, over 12 years (approximately 2 miles of which involves upgrading existing ATV trails on NFS lands)
- Using and performing maintenance (upgrading) on approximately 4.8 miles of existing National Forest System Roads (NFSR);
- Installing passive and/or active degassing equipment;
- Operating and maintaining wells for ventilation of mine while recovering E Seam reserves;
- Interim reclaiming of mud pits, seeding and mulching outslopes and cut-slopes;
- Plugging drill holes and performing final reclamation on pads when drill holes (estimated life of each MDW is three years; construction and reclamation would span 12 years); and
- Decommissioning by obliterating new access roads and decommissioning existing roads to desired service level.

Access and Road Construction

Relative to road construction, the Proposed Action would authorize construction and use of about 23.8 miles of new roads necessary for these operations. About 19 of the 23.8 miles would be new road construction, and about 4.8 miles of upgrades to existing roads. The proposed action includes a 0.6-mile re-routing of an existing life-of-mine administrative access road to address issues related to geologic hazards, sedimentation control and maintenance issues. The Proposed Action also includes authorizing use of approximately 5 miles of existing National Forest System Roads (NFSRs).

Proposal and analysis include approximately 3.2 miles of new roads (including the 0.6 mile re-route) associated with constructing or providing access to about 35 drill sites (17 individual drill sites are proposed in roadless) in the West Elk IRA. The Purpose of and Need for these locations have been approved by the Regional Forester as they fit exceptions to RACR (see Proposed Activities in IRA section below).

Access to and from the E Seam MDW drilling area and the Deer creek shaft would use a combination of County, existing NFSRs, existing life-of-mine administrative access roads serving the coal leases, and newly constructed administrative access roads.

Relief from Lease Stipulation

Conventional ventilation shaft construction[2] time is estimated at 16 to 18 months and would be constructed prior to underground mine operations reaching the shaft location. MCC is requesting relief from Winter Range Restrictions on lease C-1362 (December 1, 2007-April 30, 2008) to allow these emergency structures to be installed in a timely manner if conventional shaft construction is planned. If mine operation timing permits, a less disruptive shaft construction method may be used which would result in lower surface disturbance, less spoils, and would not require relief from the big game winter range lease stipulations.

While currently not anticipated, site-specific relief from lease stipulations relating geohazards, moderate or steep slopes, or riparian areas could arise during project implementation. The scale of stipulations mapping may not identify all surface features where the stipulation applies. This could require additional IDT review and analysis.

Proposed Activities in Inventoried Roadless Area

Operations are proposed on two active federal coal leases, and one federal coal lease effective date March 1, 2007. Portions of these are in the West Elk IRA. Approximately 3.2 miles of road construction is proposed on these leases in the West Elk IRA. The road construction is necessary for access to 35 sites for methane drainage wells. Seventeen of these sites would be located in the IRA. Roads proposed in the IRA would be for project and administrative use only, and would not be available for public use. A break down of activities proposed in IRA per lease is as follows:

C-1362

- Proposed on IRA portion of lease (including the 160-acre extension): 10 methane drainage well drill sites with 2.2 miles of road construction.
- Proposed on 160-acre modification: Two methane drainage well drill sites with one-tenth mile of road construction.
- Ventilation shaft/escapeway proposed on this lease is not in an IRA.

COC-56447

- Proposed on lease: approximately 240 feet road construction in IRA.

COC-67232

- Proposed on IRA portion of lease: 14 MDWs on 7 locations, and approximately 1 mile of road construction.

Road construction activities associated with methane drainage wells proposed in the West Elk IRA may be constructed or reconstructed because they are exempt from the prohibitions of the RACR under Exception No. 1 – protection of public health and safety in the cases of imminent threat that without intervention would cause loss of life or property. The road construction associated with the wells on the portion of lease C-1362 (that which was leased in 1967), and the road construction on lease COC-56447 (leased in 1995) are also exempt from prohibitions of the RACR under Exception No. 7 – continuation, extension, renewal of a mineral lease on lands that were under lease as of 1/12/2001.

The rationale for applying the exemptions from the RACR is as follows:

Exception No. 1 – protection of public health and safety in the cases of imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause loss of life or property.

- High levels of methane gas in the mine create unsafe working conditions for

[2] Conventional construction (top down) consists of all construction activities on the surface. All materials produced from the shaft sinking must temporarily be stored on the construction pad, including mine water discharge. Conventional sink/line construction is completed by excavating down to bedrock to install a concrete collar as the foundation for a hoist. The shaft is then sunk using drilling and blasting where all excess rock is removed and brought to the surface for temporary storage. A concrete shaft lining would be placed as the drilling and blasting proceeds.

miners and must be reduced to acceptable levels under MSHA rules.

- High levels of methane gas in the mine can lead to loss of federal property if the leased, mineable coal is destroyed through explosive or thermal events and cannot be mined.
- The only way to reduce methane to safe and acceptable levels is to install the methane drainage wells, which require temporary roads.
- Exception applies to all proposed road construction associated with methane drainage wells on all IRA lands included in the federal coal leases on which operations are proposed.

Exception No. 7 – continuation, extension, renewal of a mineral lease on lands that were under lease as of 1/12/2001

- The roads to access methane drainage wells are needed for coal mining operations and continuation of leases on lands that were under lease as of January 12, 2001.
- Exception applies to proposed road construction associated with methane drainage wells on all IRA lands included in the federal coal leases C-1362 and COC-56447 on which operations are proposed (except for a 160-acre lease modification which extended lease C-1362 on Oct. 2001).

The need for proposing operations on the federal coal leases that overlap with the IRA is based upon the configuration of the mining operations, meeting MSHA approval for the mine ventilation plan (which includes having adequate methane drainage facilities), functionality of the mine ventilation system, and limitations on using directional drilling because of overburden thickness.

General mining operations for recovering the E Seam reserves at the West Elk Mine include developing longwall panels in oriented in a southeast to northwesterly direction. Mining these panels would occur from southeast to northwest. The configuration of the mine plan in federal coal reserves is reviewed by the BLM to ensure that maximum economic recovery of the coal resource occurs. Thus, the projected mine plan is configured to ensure that all recoverable reserves are included.

Based on experience mining B Seam reserves at other parts of the West Elk Mine, MDWs work most efficiently when placed on the "headgate" side of the longwall panel where fresh air is brought into the active workings by the ventilation system. If MDWs are not placed in this manner, then the ventilation system 'fights' with them and makes them less efficient, which leads to reduced capacity to regulate the amount of methane in the workings leading to safety concerns and operational downtime. For the E Seam reserves, to maximize efficiency, the MDWs are placed on the north side of the planned longwall panels where the headgate for each panel will lie. The alignment of the longwall panels and need to place MDWs near the headgate side requires that these facilities be placed in the IRA.

Spacing requirements for MDWs of 750 feet are currently directed by MSHA based on anticipated mine conditions as submitted in a Mine Ventilation Plan provided by MCC, as is the need for additional ventilation at the beginning of a longwall panel which is also the limit of recoverable E Seam coal reserves. The development and implementation of a mine ventilation plan requires several steps as outlined below:

Conceptual mine plans are developed to recover the mineable coal deposit.

Ventilation layouts are then applied to the mine plans and are used to help distinguish the most feasible plan to meet the following criteria:

- Provide for the health and safety of all miners;
- Comply with the Federal Coal Mine Safety Standards (30 CFR Part 75). The Department of Labor is charged with enforcing these laws/standards. MSHA

represents the Department of Labor in the field by physically inspecting each mine; and

- Provide ventilation for the safe production of coal in today's competitive market place.

Ventilation engineering firms develop computer models of the mine ventilation system based on exiting mine ventilation to project ventilation needs for proposed future mining.

The projected ventilation plan is taken to MSHA for preliminary discussion. Several meetings with MSHA usually result in a plan ready for submittal.

MSHA reviews the submitted plan and can either reject it or approve it. Once MSHA approves a plan the contents of that plan become part of the "Standards" (30 CFR Part 75) that MSHA enforces as the mining takes place.

The approved ventilation plan changes as the mining advances and each change has to be submitted to MSHA for review and approval before it can be implemented.

Given the prior experience with effective methane drainage at the West Elk Mine, it is anticipated that a MDW would be needed every 750 feet along each longwall panel in order to meet MSHA approval requirements for the mine ventilation plan. Based on the mine plan configuration with panels extending under portions of the IRA, ventilation plan requirements convey the need to place MDWs and access roads to them in the IRA.

The proposed action has been designed to use directional drilling to the maximum extent possible. However, this is limited by the thickness of overburden (or amount of rock) overlying the E seam. This limited thickness of overburden precludes the ability to drill exclusively from outside the IRA boundaries and hit the MDW targets needed in the ventilation plan. Although use of directional drilling opportunities has been used as much as possible, in places the overburden is not thick enough for directional drilling either from outside the IRA to be practical or possible, therefore some of the operations and hence road construction, would be placed in the IRA.

Reclamation

A plan for reclamation would be submitted through the DRMS permitting process and reviewed by the Forest Service. These plans would be consistent with State requirements, identified post-mining land uses consistent with Forest Plan direction, and incorporate any specific reclamation goals identified in this analysis. Goals of the plan, consistent with DRMS and FS standards include slope stabilization and naturalization; sedimentation and siltation control to protect water quality of near-by surface waters; and meeting requirements to restore roadless character; return soil productivity as much as possible; and restore vegetative vigor, health, species composition and diversity to support post-mining land uses and Forest Plan goals.

Reclamation of MDW sites and roads would be contemporaneous with construction when facilities are no longer needed for mine operations in that panel except for life of mine roads.

Design Criteria

The Forest Service also developed design criteria measures to be used as part of the action alternative with the objective of protecting resources. The design criteria measures are detailed in **Table 2-2** of the EIS and address the following resource areas: Transportation and IRAs; Water Resources; Wildlife; Vegetation; Threatened, Endangered and Sensitive Species; Visuals; Geology, Soils and Minerals; Air Quality; Recreation; Cultural Resources; Construction Activities; Drilling and Completion of MDWs; Reclamation Activities; and, Compliance Requirements.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of compliance with Mine Safety and Health Administration requirements for methane gas management, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

Flaring of Methane Gas

Flaring of methane gas may cause mine explosions due to fluctuations in the levels of methane. This is an undesired condition and is not approved by MSHA.

Capture/Use of Methane and Leasing of Coal Mine Methane

Capturing the coal mine methane rather than allowing it to vent was brought forward as an alternative. The natural gas that occurs in the coal seams and adjacent strata that will be encountered during production of the E seam coal reserves in the project area is considered a federal resource that is managed by BLM. Lands in the project area were identified in the GMUG's 1993 Oil and Gas Leasing EIS as having high potential for oil and gas to occur, and made available and authorized for oil and gas leasing. Gas lease nominations have been made for the project area, however none of the parcels has been offered for lease. Absent an oil and gas lease, the methane encountered as a byproduct of the mining cannot be captured and put to beneficial use. Further, the BLM has identified that mineral resources occurring the area within the boundaries of the Somerset coalfield under 3,500 feet of overburden will be managed for recovery of coal reserves. The project area falls within these boundaries. Should the gas lease nominations come up for sale, they could be purchased and the coal mine methane could then be captured, however infrastructure (including pipelines, compression facilities, etc) would have to be installed in order to transport gas from the collection points. This alternative was not considered in detail because it does not meet the purpose and need.

Methane Drainage Wells only on Currently Leased Coal Areas

Public comment requested that the project be limited to areas within existing federal coal leases. It was mentioned that a decision to allow the methane drainage wells in currently unleased areas would serve to improve the prospects of leasing and developing unleased federal land. This alternative was not considered in detail because, with the sale of the Dry Fork Lease effective date March 1, 2007, all lands in the project area have been leased.

Use Horizontal Boreholes or Longhole Horizontal Boreholes

Mine Ventilation Plans including design of ventilation system are approved by MSHA from submittals and measurements made by MCC. Based on preliminary plans these types of boreholes alone are inadequate for proper ventilation and efficient mine operations. These methods are already used by MCC where possible.

Directionally Drill MDWs from Outside IRAs

Directional drilling is limited by the thickness of overburden (or amount of rock) overlying the coal E seam. This limited thickness of overburden precludes the ability to drill exclusively from outside the IRA boundaries and hit the MDW targets needed in the

ventilation plan. Therefore, use of directional drilling opportunities has been used as much as possible, however because in places the overburden is not thick enough that directional drilling either from outside the IRA is practical or possible, therefore some of the operations must be placed in the IRA

Do Not Construct Roads or MDWs in IRAs

An alternative that included acreage in the IRA separately was considered, but eliminated from detailed study because, with Regional Forester approval of access roads to MDWs for health and safety reasons under 2001 RACR exception, it was determined unnecessary to analyze separately. Roadless will instead be analyzed as part of the Proposed Action. In addition, some areas that do not fall under the exceptions of the 2001 RACR will not be implementable, but will be analyzed in the event the RACR is changed.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative considered in detail. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives. The analysis assumed that since coal could not be mined economically without the methane drainage, ventilation shaft and escapeway, the Alternative 1 would result in previously leased coal not being mined from the area affected. As discussed earlier in this chapter, the no action alternative would likely cause underground coal mining operations in the E seam to slow significantly or diminish entirely over time, due to the economic feasibility.

Table S-1 Comparison of Alternatives		
	Alternative 1 No Action	**Alternative 2 Proposed Action**
Workforce	Maintain current level of employment at West Elk Mine through 2008.	Maintain current level of employment at West Elk Mine through about 2015.
Revenues Generated (includes royalties)	No revenue or royalties received if coal not mined	$ 729 million
Coal Supplied	0 tons after 2008	75 million tons
Safety of Mine Workers	Mine worker safety protected through mine closure	Mine worker safety protected through adequate ventilation and escapeway.
Threatened, Endangered, Sensitive Species	No effect	Short-term loss of winter habitat for bald eagles. Short-term loss and temporary disturbance of Canada lynx habitat. Mitigation measures would ensure that species would not be adversely affected.
Management Indicator Species	No effect	Short-term loss of habitat and temporary disturbance for those MIS occupying the project area. Species may be temporarily displaced, but there would be no long-term impacts and population viabilities would not be reduced.
General Wildlife	No effect	Short-term loss of habitat and temporary disturbance for those wildlife species occupying the project area. Species may be temporarily displaced, but there would be no long-term impacts and population viabilities would not be reduced
Winter Range	No effect	Request relief from lease stipulations. This would result in some temporary disturbance and short-term loss of winter range, but long-term impacts would not occur.
Topographic Surface	No change	Subsidence above the mined area
Land Stability	No effect	Minimal risk of destabilizing slopes
Soils	No effect	Maximum 210 acres disturbed
Geologic hazards	No effect	Minimal risk of hazards due to slope, landslide and mass wasting.
Minerals	No additional coal removed	75 million tons of coal removed
Range Resources	0 acres disturbed	164 acres of Gambel oak, 13 acres of grass/shrub disturbed
Wetlands	No effect	Minimal risk of vegetation disturbance

Table S-1 Comparison of Alternatives		
	Alternative 1 No Action	**Alternative 2 Proposed Action**
Forest	0 acres disturbed	Maximum of 106 acres of aspen and 3 acre of spruce-fir disturbed
Recreation	No impact	Some seasonal modification of recreational user's activity and access during the construction and operation of the methane drainage. Opportunities for semi-primitive motorized and non-motorized activities would be negatively impacted
Inventoried Roadless Area	Road use associated with the previously approved methane drainage activities would continue	0.6 miles of upgraded OHV access and ~2.5 miles of new road within IRA
Grazing	No impact	Short term decreases in available AUMs and potential long term increase in forage at reclamation sites in Gambel oak types
Roads	No impact	6.8 miles of upgraded roads and ~19 miles of new road, short term and periodic access restrictions on NFSR 711
Impacts on Visual Quality Objectives	No impact	Effects are consistent with partial retention VQO
Impacts to Class I Airsheds	No impact	No impact
Gaseous emissions (NO_2, SO_2, and CO)	No effect beyond current levels	36,000 pounds per year
Greenhouse gas (methane) emissions	No additional emissions	Less than 0.1% concentrations 50 meters from the source
Fugitive dust	No impact	32,000 pounds per year or less
Impacts to surface water flows and surface water quality, and riparian habitat	No effect	Minimal effect on surface water quality, 13 new stream crossings, ~6 acres of new and upgraded road disturbance in water influence zone with a maximum of 18 acres of riparian vegetation disturbance
Impacts to ground water levels and ground water quality	No effect	No effects on ground water quality or quantity