

2.05 APPLICATION FOR PERMIT FOR SURFACE OR UNDERGROUND MINING ACTIVITIES

2.05.1 Objectives

This section is an overview of the underground coal mining operation and the associated surface operation MCC plans to continue using at West Elk Mine. The life of the mine may be about 40 years, depending upon the financial viability of the operation.

2.05.2 Operation Plan – Estimated Area for Life of Operation

West Elk Mine has been producing coal since 1982. Before 1990, coal was produced from the F Seam using the room and pillar method. In 1990, MCC accessed the B Seam and developed longwall panels suitable for modern longwall mining equipment. Longwall mining of the northern B Seam reserve areas continued through 2008. In 2004, MCC initiated work to develop entries and longwall panels in the E Seam and longwall mining commenced in late 2008. In 2015, MCC began development of rock slopes from the E Seam to the B seam, and thereafter will initiate development mining activities in the B Seam to support future longwall mining beneath mined E Seam longwall panels LWE1 through LWE5. MCC could not longwall mine in the B Seam below these E Seam longwall panels earlier without potentially rendering them unminable.

Mine Layout

The extent of the F Seam mine workings of West Elk Mine are shown on Map 50. The mined and projected B Seam mine workings are shown on Map 52. The mined and projected E Seam mine workings are shown on Map 51. The F Seam portals and principal surface facilities are located in Section 16 of Township 13S, Range 90W, 6th P.M.

MCC developed the F Seam by driving a series of main entries from the point where the seam outcrops. A total of nine main intakes and seven main returns were driven. The main entries were driven southwest to avoid an area along the margin of Sylvester Gulch of predicted poor hydrologic and geologic mining conditions. Submains were developed east and west from the main entries. From these submain entries, room and pillar panels were developed.

MCC accesses and ventilates the unsealed entries of the mined northern B Seam workings via two slopes and a ventilation shaft driven from the main intakes of the existing F Seam workings (Figure 16). Ventilation and access to B Seam is also provided by ventilation shafts constructed in Sylvester Gulch. One of the slopes from F Seam is a haulage entry for men and materials and an intake airway. The second slope entry contains a 60-inch conveyor belt. Both slopes are approximately 2,450 feet long with a 14 percent grade. The haulage entry is about 18 feet wide by 11 feet high. The slope entry with the conveyor belt is 14 feet wide by 9 feet high.

A 400-foot long by 18-foot diameter ventilation raise connects the B Seam return air entries with the return air entries of the F Seam. Intake shaft #1 in Sylvester Gulch provides a primary escapeway from and ventilation to the B Seam. This intake shaft is a two-compartment

Figure 16, F to B Seam Slope Cross-Section

shaft, one compartment for ventilation and the other for a mine hoist for transporting men and light materials. Ventilation shaft #1 is 650 feet deep and 34-feet in diameter and shaft #2 is 693 feet deep and 28-feet in diameter. Both shafts are concrete-lined.

The E Seam workings are accessed from the existing slopes between the F and the B seams. The two slopes are separated by approximately 100 feet horizontally, and the portion of the slopes between the F and the E seams is approximately 1,000 feet long. The southern B Seam longwall panels will be ventilated and accessed through three rock slope entries and a ventilation shaft between the E and B Seams. The rock slopes will be nearly 1,400 feet in length on a 14% grade and the ventilation shaft will be about 20 feet in diameter and 200 feet in depth.

Production Methods and Equipment

Longwall technology is employed at West Elk Mine. The first longwall (utilized in the northern B seam area) was acquired in 1992 and was updated over the years. A new longwall was acquired in 2008 for mining the E Seam and is also well-suited for future mining the southern B Seam longwall panels.

Longwall panels are developed using conventional continuous mining methods. Several key pieces of equipment, including continuous miners, diesel-powered coal haulers, roof-bolters, feeder-breakers, and other support equipment are used to develop headgate, tailgate, and other entries for the longwall panels.

Additionally, retreat mining is used at the West Elk Mine. This is done by taking alternating lifts from each side of the existing entryway's and retreating outby. The equipment used to mine in this fashion are two mobile roof support (MRS), a continuous miner, ramcar and/or end drive shuttle cars. Detailed mining sequences can be found in Exhibit 84, the [Geotechnical Assessment For The Purpose Of Pillar Extraction Between 2 And 30 Crosscuts In Sunset South Mains](#), dated December 27, 2023.

All coal is conveyed to the surface via conveyor systems. Other mining infrastructure includes electric power supply, water supply, water discharge, rock dust supply, compressed air supply, communications, mine monitoring, and other ancillary mining support systems. Associated surface facilities include main ventilation fans; mine dewatering installations; mine ventilation borehole systems; coal stockpiles; coal crushing, screening, and conveying systems; silos for coal storage; train loadout facilities; maintenance and warehouse facilities; office/bathhouse facilities; and various ancillary facilities.

Coal Reserves and Recovery

The West Elk Mine reserve base consists of mineable coal reserves in seven Federal coal leases, one private (fee) lease, and other fee coal properties. The Federal leases are D-044569, C-0117192, COC-56447, COC-54558, C-1362, COC-67011, COC-67232. The private lease is the Mt. Gunnison Fuel Company lease.

Together, the eight coal leases and fee properties encompass about 19,620 acres. Federal leases D-044569, C-0117192, COC-54558, COC-56447, C-1362, COC-67011, and COC-67232 account for 1,380 acres, 923 acres, 1,012 acres, 2,770 acres, 5,797 acres, 690 acres, and 2,448 acres, respectively. The private lease and fee coal covers the remaining 4,600 acres.

Six major coal seams exist on MCC lease holdings. The seams are identified alphabetically with the A Seam being the lowermost and the F Seam the uppermost. The intervals between the seams vary from as little as 15 feet to more than 250 feet. Current and future economically minable coal reserves in these leases occur in two of the six seams (the E and B Seams). The northern B Seam reserves have been mined and the E Seam will continue to be mined as projected on Map 51. The past and projected B seam mining is shown on Map 52. MCC mined in the F Seam from 1982 to 1991 from Lease D-044569 and C-0117192. This mining was only marginally successful. Poor mine roof conditions, sandstone channels, thin coal, poor coal quality, and other unfavorable conditions negatively affected mining and rendered this seam uneconomic under past and present market conditions.

Approximately 180 feet below the F Seam horizon lies the E Seam. Approximately 400 feet below F Seam and 200 feet below E Seam lies the B Seam. The northern mineable B Seam reserves contained some areas of coal, particularly in Federal Leases D-044569, C-0117192, COC-54558, and COC-56447 where no mineable E Seam exists above the B Seam. As such, B Seam mining in this area caused no issues for E Seam. Recovering the two economically-viable seams at West Elk Mine requires thorough evaluation of various mining scenarios. The mineable areas of the E and B Seams can be seen by comparing Map 13 (B Seam thickness) with Map 18 (E Seam thickness). E and B Seam projected operations, maximizing the recovery of reserves, are shown on Maps 51 and 52, respectively.

MCC has assessed the recoverable coal reserves of the Federal coal leases contained in the E and B Seams. **As of the end of 2023, approximately 39.92 million** tons of recoverable coal reserves were estimated to remain in the E and B Seams (Table 28) within the current permit and lease areas.

Table 28							
Estimate of Recoverable Coal Reserves at the West Elk Mine							
Recoverable Reserves (millions of tons)							
	Lease	Lease	Lease	Lease	Lease	Other	
Seam	COC-56447	COC-67232	C-1362	D-044569 & COC-67011	COC-54558 & C-0117192	Fee Lease	Total
B	0.15	7.4	23.2	0	0	0.01	30.76
E	0	0	6.6	0	0	2.56	9.16
Total	0.15	7.4	29.8	0	0	2.57	39.92

The mine panels were and have been laid-out to recover as much coal as possible with consideration for personnel and equipment safety and surface protection. The percent of recovery in the development (room and pillar) sections is approximately 40-60 percent, more or less, depending upon pillar design. Longwall panel extraction methods increase that extraction

ratio to 80-90 percent for the mining height, which is planned at approximately 10.0 to 12.0 feet for the B Seam and 8.0 to 14.0 feet for the E Seam. Using retreat mining in the mains, MCC plans on recovering 30 to 60 percent of the remaining coal depending on the location of the pillar.

In 2023 mining was completed in the Sunset South Panels located in the E Seam. While mining this area many adverse mining conditions were encountered including faults and partings, and poor roof conditions due to the presence of mudstone bands, coal rider seams and weak laminations. Furthermore, on development it was found that the seam height reduced to a non-minable height on the east sides of the panels, causing all four Sunset panels to be shortened from earlier projections documented in Permit Revision 15 (PR-15).

During longwall mining of Panels SS3 and SS4 the mudstone bands, coal rider seams and weak laminations created an un-washable product resulting in the need to cease mining earlier than projected in both Panels. SS3 Panel had a projection of 2.3 million tons and produced 2.0 million tons. SS4 Panel had a projection of 2.2 million tons and produced 0.4 million tons.

The actual coal recovery will depend on the method of coal extraction as well as the actual coal seam thickness. Using room and pillar methods, MCC recovered about 50 percent of coal reserves in the F Seam. Using the longwall mining method, MCC has recovered and plans to recover about 80 percent of the thickness mined for the coal reserves of the B and E Seams (Table 29), based upon the current plans projected operations (see Maps 51 and 52.) Anticipated annual production is shown with expected employment needs in Table 32, (Section 2.05.3).

Table 29 Recovery Rates for Room and Pillar and Longwall Mining Methods	
Room and Pillar Method	
Location	Coal Recovery
Main Development	30 – 40 %
Mains Retreat Mining	30 – 60%
Submain Development	30 – 40 %
Panel Mining	
Partial Pillar Extraction	45 - 55 %
Full Pillar Extraction	60 - 80 %
Total	50 %
Longwall Method	
Location	Coal Recovery
Main Development	30 – 40 %
Submain Development	30 – 40 %
Panels	80 – 90 %
Total	80%

Mining Equipment

Mining equipment in use at West Elk Mine varies. Typical equipment used in the development mining operations is shown on Table 30. Typical equipment used in the longwall mining operations is shown on Table 31.

Use and Conservation of the Coal Resource

The mine plan has been laid out to recover as much coal as practical, considering prudent mining practices and economic viability of the operation. Longwall technology is utilized at West Elk Mine to achieve the maximum economic recovery of the coal reserves, enhance personnel safety, and protect surface resources. Although this method attains the highest overall reserve recovery, not all coal will be recovered.

Although high recovery rates will be achieved with longwall technology in the E and B Seams, some coal will remain unmined. Because of the specific block pattern needed for longwall panel development, small areas of marginally thick E and B Seam coal will not be mined. These areas occur where the planned longwall panel layout cannot be configured to fit the reserve area. Where E and B Seam mining will occur, some top coal, from one to two feet in thickness, will be left unmined in the roof to improve roof conditions and hence, personnel safety and product quality. Because the full seam thickness commonly exceeds the maximum extraction height of the mining equipment, some floor coal will also be left unmined.

To recover as much coal as possible the retreat mining method was introduced in 2024. This method recovers coal from existing main roads, gate roads, longwall recovery chute roads, and solid coal barrier pillars positioned along outside entries.

Table 30	
Typical Equipment Used for Longwall Development Mining at West Elk Mine	
Equipment	Principal Use
Continuous Miner	Cutting Coal
Diesel Shuttle Car	Transport Coal To Feeder
Feeder Breaker	Break Coal/Meter Flow To Belt
Section Conveyor Belt	Transport Coal To Main Belt
Main Conveyor Belt	Transport Coal To Surface
Roof Bolter	Primary/Secondary Roof Support
Power Center	Provide Electrical Power
Auxiliary Fan	Provide Face Ventilation
Water Truck/Wagon	Dust Suppression-Roadways
Rock Duster-Mobile	Section & Outby Dusting
Trickle Duster	Return Entry/Beltline Dusting
Bulk Dust System	Mine-wide Rock-dusting & Transport
Mine Monitoring System	Equipment Control, Monitoring & Safety
Scoop/LHD	Clean-Up/ Equipment Moves
Maintenance Tender	Mining Equipment Maintenance
Boom Truck	Utility-Supply/Maintenance
Mantrip	Personnel Transport
Grader	Roadway Maintenance
Fork Truck/Hydraulic Trailer	Supply Transport
Utility/Maintenance Vehicles	Support/Transportation

Other coal beds occur in the West Elk Mine area that are generally thin, discontinuous, and of poor coal quality. The mining of these seams is not planned. These seams are, in ascending order, the A Seam, the C Seam, the D Seam, and further F Seam. The A Seam is typically less than five feet in thickness and occurs too close below the B Seam to be economically recoverable. Likewise, the C Seam is typically thin, split with rock partings or absent in the West Elk Mine coal lease area. The C Seam also lies sufficiently close to the overlying B Seam

to allow recovery of both seams using longwall mining methods. Likewise, the D Seam occurs as a thin coal bed in the West Elk Mine coal lease area and occurs too close below the E Seam to be economically recoverable. Where the D Seam merges with the overlying E Seam, the upper portion of the D Seam may be mined locally, with the E Seam. Previous mining operations in the F Seam have been unsuccessful. Because of seam thinning, poor roof conditions and coal quality, attempts to recover the F Seam have historically proven to be uneconomic.

Table 31	
Typical Equipment Used in Longwall Mining at West Elk Mine	
Equipment Type	Principal Use
Double Ended Ranging Shearer	Cuts Coal From Longwall Face
2 Leg Hydraulic Shields	Roof Support
Pan Line With Chain Conveyor	Transports Coal To Stage Loader
Hydraulic Pump Station	Powers Shields & Panline Advance
Power Distribution Center	Provides Electric Power To Shearer
	Conveyor and Other Equipment
Longwall Support Equipment	Move Equipment From Outside and
	Between Panels

MCC will take all reasonable actions necessary to minimize waste and damage to the remaining coal resources by appropriate mine design and extraction techniques.

Operation Description

The primary mine facilities and portals were developed in Section 16, T13S, R90W in 1981 and 1982 to support continuous miner room and pillar mining in the F Seam. West Elk Mine was developed using continuous miners in a series of main entries, submain entries, and gate entry development. In 1990, slopes were driven from the existing F Seam main entries in Section 21, T13S, R90W to the underlying B Seam. A similar system of main entries, submain entries, and gate entry development was continued in the northern B Seam reserves. Development of main and submain entries and longwall panels in the E Seam was initiated in June 2004 from the existing F to B Seam slopes. In late 2015, three rock slope entries were developed from the E Seam to the southern B seam reserves. MCC utilizes two methods of mining coal at West Elk Mine. They are room and pillar for development mining and a retreat longwall system for production mining. Room and pillar mining was the only method used in the F Seam. It was and will be used in the B and E Seams for development mining. Longwall mining was and will be utilized in the B Seam and is utilized in the E Seam, as well.

Room and Pillar Mining Method

Development mining at West Elk Mine involves driving entries and cross-cuts through the coal seam and leaving coal blocks to support the overlying strata. The resulting entries provide travel-ways, ventilation, and locations for installing infrastructure to support mining activities. This infrastructure includes conveyors, power, water, communications, rock dust, etc.

For development mining, MCC uses a system of continuous miners, haulage vehicles, and a conveyor system to cut and transport the coal out of the mine. First, continuous miners cut the coal from the seam. This cut coal is then loaded from the miners into diesel or electric haulage vehicles. Finally, the haulage vehicles transport the coal to the conveyor system for

transportation out of the mine. After a cut of coal is mined, a roof bolter moves in and installs roof bolts to support the roof. Conventional twin-boom roof bolters provide primary roof support by installing resin-anchored roof bolts, conventional roof bolts, combination roof bolts, or other approved systems. Bolt lengths and use of plates, mats, and mesh or other supplemental materials are determined by roof conditions.

The mine has a MSHA-approved roof control plan to provide protection under the anticipated conditions. Roof support materials that are allowed under this approved plan include mechanical roof bolts, roof trusses, resin-anchored roof bolts, timbers, resin-anchored cable bolts, steel crossbars, yieldable arches, crossbars, wire mesh, concrete props called “cans” and other commonly used mine roof support means. For support of long-life entries, air-courses, critical ancillary installations, overcasts, and other permanent or semi-permanent facilities, supplemental roof support may be installed, if inspections indicate that the roof is weakening. Supplemental roof support has also been utilized in the longwall panel bleeder and tailgate entries. The roof control plan also includes provisions for installing supplemental support if a loose or badly sagging top is detected or where abnormalities are discovered.

Main Entries & Sub-Main Entries

At West Elk Mine, from five to ten entries are typically mined as main entries. The number of entries depends on mining conditions, and ventilation and access requirements. As few as three entries could be driven in special circumstances. The entries are used for intake and return air ventilation, coal haulage, and men and material transportation. The entries are driven parallel to each other and are generally on 100 to 200 foot centers. Crosscuts are also generally on 100 to 200 foot centers. The entries are separated as necessary by stoppings.

Room and Pillar Panels

F Seam room and pillar panels generally consisted of 6 to 8 entries driven on 60 to 100 foot centers and with crosscuts on 60 to 120 foot centers. During secondary mining of the room and pillar panels, additional rooms may have been developed on one or both sides of the initial development. Sufficient barrier pillars were left to protect the main entries and bleeder entries (if separate bleeders were utilized). During secondary mining, partial or full pillar extraction was completed, depending on conditions in the panel.

Longwall Mining Methods

MCC uses longwall mining technology to mine the B and E Seams. Longwall panel layouts consist of gate-roads driven by continuous miners, a longwall face about 1,100 foot wide, and necessary ventilation and conveyor entries, and barrier pillars.

After the ventilation and gate-road entries are completed, a longwall set-up or start room is driven at the far end of the panel. Longwall equipment is moved in and assembled. Once equipment is ready, the longwall system mines the panel in a retreat fashion until it reaches the main entry barrier pillar. The equipment is then disassembled and moved to another panel.

Longwall Gate-Roads

Room and pillar methods are used to develop gate-road entries for the longwall mining equipment. Generally, two to five parallel entries are driven on 100 to 200 foot centers. A three-entry yield abutment design has typically been used. The size and configuration of longwall gate pillars is based on the regional geology, and depth of cover. Longwall panel barrier pillars are left to protect main entries and bleeder entries.

Bleeder Entries

Bleeder entries were developed to ventilate active and previously mined longwall areas until those areas were permanently sealed. Bleeder entries were connected to the main return air ventilation system. In November 2009, the main mine ventilation system for the E seam and southern B seam was converted to a blowing system that includes a “bleederless” ventilation system resulting in each panel being progressively and/or completely sealed upon completion of mining of that panel.

Barrier Pillars

A barrier pillar is a large block of solid coal left in place to protect active mine workings. Barrier pillars are left between longwall panels and main entries, between submains and longwall panels, or in other areas, as needed. Barrier pillars vary in size, and designs are based primarily on life-expectancy and degree of protection required for the barrier. Design criteria include depth of overburden, horizontal stresses, etc. In all cases, the dimensions of barrier pillars will be adjusted for prevailing conditions, to provide the protection for which they are intended.

Mining Under Restricted Areas

No major buildings, major structures, occupied dwellings, cemeteries, parks, railroads, or highways overlie the coal planned for extraction at West Elk Mine. Although two reservoirs are within the coal lease area controlled by MCC, the reserves in the E and B Seams under these reservoirs have been legally severed from the lease. As such, no mining is planned beneath any portion of these reservoirs. Dry Fork of Minnesota Creek runs through the coal lease area and conducts water from Deep Creek Ditch to Minnesota Reservoir. As discussed in Section 2.05.6, longwall mining, rather than leaving pillars or coal barriers, is less impacting to the stream, and any downstream water uses are effectively protected by MCC’s approved adjudication plans.

Health and Safety

General Mine Safety

MCC has established that it is the responsibility of all employees to make the environment and health and safety their first consideration, and that no phase of operation or administration has greater importance. Achieving safe and environmentally sound performance of tasks in

relationship to man, machines, and the environment is a core value, as opposed to a priority. To this end, MCC has developed an environmental, health and safety policy for West Elk Mine.

Explosives and Blasting

The mining techniques used at West Elk Mine do not require blasting as part of the regular extraction cycle. Occasionally, explosives are used for underground construction purposes, the removal of large rock or rock spars in the mining area, and when cutting rock is prohibitive with mining equipment. These uses require relatively small quantities of explosives. MCC's formal Explosives Handling and Blasting Procedures are presented in Exhibit 41. Map 53 shows the location of the powder magazine.

Limited application of explosives may be necessary for surface construction activities, such as road cuts and other surface construction. State and Federal mine safety and health regulations and other appropriate regulations will be followed in all circumstances where explosives are used, whether by contractors on the site or by MCC personnel, including Rule 4.08 of the CMLRB's Regulations for Coal Mining. Blasts that use more than 5 lbs. of explosives or blasting agent will be conducted according to a pre-blasting schedule (4.08.3). As appropriate, a pre-blasting survey (4.08.2) will be performed. Refer also to Exhibit 43, "Specifications for Rock Blasting During Road Construction".

Fire Prevention

The facilities at West Elk Mine were designed and constructed to take into account the most effective means of fire prevention. All buildings have been constructed to meet the National Fire Protection Code, National Electrical Code, and other construction codes. The material used in construction is as fire resistant as possible. Belt conveyor systems are equipped with fire detection and suppression equipment. Underground belt conveyor systems are equipped with fire warning alarm systems as required by the Mine Safety and Health Administration.

Fire prevention is also considered for mining equipment. All mining equipment is equipped with fire suppression systems. In addition, fire-resistant hydraulic oil is used in machinery whenever practical.

A variety of fire-fighting equipment is available at West Elk Mine. In addition, fire-fighting equipment is examined regularly to assure that it is fully-operative. ABC-type fire extinguishers of various sizes are available throughout the mine facilities. The prime source of underground fire-fighting capability is the water from pipelines within the mine. Water cars and foam machines are also available for emergency situations.

Personnel at the mine have had training in fire-fighting procedures and some have specific assignments related to fire protection. The fire-fighting training program in use at West Elk Mine includes training for miners in locating, using, and maintaining fire-fighting equipment and escape-ways. Security personnel are assigned fire watch for surface facilities as part of their responsibility. In addition, a clean-up program has been designed to eliminate any accumulation

of combustible materials. West Elk Mine's program is approved by the District Office of the Mine Safety and Health Administration (MSHA).

Ventilation

Ventilation in the working sections where coal is being cut, and at the last open crosscut, has been established to assure compliance with current Federal and State regulations. Abundant fresh air is provided to the working face to dilute mine gases and diesel emissions to acceptable levels. Stoppings are constructed of non-combustible material and built as airtight as possible to assure that the maximum amount of clean air reaches the working face. Mine Ventilation Boreholes ("MVB", a.k.a. "MDW") are also drilled from the surface to about 25 feet above the top of the coal seam to be longwall mined. After the longwall face undermines the coal below the MVB, a methane-driven mobile pump is started to supplement the ventilation system by exhausting the methane from the caved gob area out of the mine rather than allowing it to enter the main mine ventilation courses.

For the protection of the employees, the air courses are examined in accordance with State and Federal standards or more often, if necessary, to protect the quality and quantity of air underground. Methane above the permissible limits is either diluted and rendered harmless in active areas of the mine through mine ventilation or drained-off prior to and during active mining through the MVB systems.

Electrical Power

All electrical equipment at the mine meets applicable Federal regulations. In addition, regular, documented inspections of the equipment are conducted. Equipment is adequately grounded to prevent electrical shock hazards. Fences, metal buildings, and metal structures are also properly grounded to prevent electrical shock hazards. Communication wires and exposed power conductors entering the underground mine have lightning arresters and are hung or adequately protected against mechanical damage.

Employees trained to perform electrical work are certified for that type of work by the appropriate State and Federal agencies. Except for troubleshooting, work is not performed on energized electrical equipment. Thus, high voltage lines, both on the surface and underground, are de-energized and grounded before most work is performed.

Accidents

MCC reports to the applicable State and Federal agencies all serious accidents damaging the mine, the lands, or other resources that could cause air or water pollution. The agencies are notified by telephone or in writing. At the same time, MCC identifies any corrective actions initiated to resolve the situation.

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