

The location of all buildings, surface and sub-surface man made features, public roads, waste piles, sediment ponds, and water impoundments are shown on [Plates 5-2](#).

521.130 Landownership and Right of Entry and Public Interest Maps

521.131 Land Ownership Maps

All boundaries of lands and names of present owners of record of those land, both surface and subsurface are shown on [Plate 1-2](#) and [Plate 1-3](#).

521.132 Boundaries of Land C.W. Mining Has Right of Entry To.

These boundaries are shown on [Plate 1-2](#) and [Plate 1-3](#).

521.133 Protection of Public Interest

C. W. Mining currently has no operations within 100 feet of public land or a public road.

521.140 Mine Maps and Permit Area Maps

521.141 Disturbed Boundary and Timing Of Mining

The boundary of all disturbed and proposed disturbed areas are shown on [Plates 5-2](#). The areas to be mined and the sequence and timing of the mining are shown on [Plate 5-1A \(Blind Canyon Seam\)](#), [Plate 5-1B \(Hiawatha Seam\)](#), and [Plate 5-1C \(Tank Seam\)](#). [Plates 5-2](#) also shown the changes to all facilities and features that have been or will be made. The boundary showing all areas that may be affected by mining is shown on [Plate 21-1 \(Permit Boundary\)](#).

R645-301-522 Coal Recovery

It is in the interest of C. W. Mining Company to maximize the recovery of coal resources. A large portion of C. W. Mining's coal resources are contained in Federal leases. A major condition of each lease agreement is maximum recovery of resources. When accessible, mine workings in each lease are inspected on a regular basis by the Bureau of Land Management personnel experienced in underground coal mining methods. Justification for not recovering coal deposits that may be detrimentally affected in terms of future recovery by the proposed operations include the following.

- A. Seams that are too thin to be economically minable given existing or reasonably foreseeable technology.
- B. Coal seams separated by insufficient rock intervals to allow safe mining above or below worked out areas.
- C. Seams that are relatively thick but not extensive, and isolated by thin coal which would make development cost prohibitive.

There are four main seams in the Bear Canyon Property, the Tank Seam, the Bear Canyon Seam, Blind Canyon Seam, and Hiawatha Seam. ~~There are no plans to mine the upper Bear Canyon seam-~~ There are no plans to mine both seams due to the close proximity of the Bear Canyon seam to the Blind Canyon Seam (<30 feet interburden). There are no plans to mine the Hiawatha Seam in Wild Horse Ridge due to the thinning of the seam. Mining plan, sequence and projected development for the Bear Canyon, Hiawatha, and Tank seams are shown on [Plates 5-1A, 5-1B and 5-1C](#) respectively. Geology information is discussed in [Chapter 6](#).

R645-301-523 Mining Method

Mining at the Bear Canyon complex is done by a longwall and continuous miners. ~~The miners discharge into shuttle cars, which carry the coal to the feeder breaker. The feeder breaker discharges the coal onto the belt conveyor where it is taken out of the mine.~~ The main entries consist of a five-entry system on 80 ft -200 ft centers to be driven to the property limits. For longwall recovery 2-5 gate entries are driven off the mains on either side of the panel to the head of the panel where they are connected by bleeders. The longwall then mines out the panel. For continuous miner recover sub-mains consisting of five entries on 80 ft - 200 ft centers are then driven off the mains and room-and-pillar panels are developed off the sub-mains. Rooms are developed within the panels on 70 ft - 150 ft centers. This is referred to as “Development”. The pillars are then recovered according to the approved plan. This is referred to as “retreat”. Timber or mobile roof supports are installed to support the roof and provide for breaker control of the caving roof. Retreat mining of this type will provide a recovery of 70pct - 80 pct within the panels. See [Figures 5-1](#) and [5-2](#). Sub-mains under the escarpment area in Bear Canyon will be developed and left.

Anticipated average annual production is 2,100,000 Tons from the longwall face and 400,000 Tons from development mining. Before the longwall face comes on line and after it is finished some room and pillar retreat mining will be done. The average annual production from room and pillar retreat mining is 600,000 Tons.

As can be seen on [Plates 5-1A](#) and [5-1B](#), the lower seam workings are planned to be columnized with the upper seams as closely as practicable. Where this is not practiced due to geologic conditions, pillars will be adequately sized to afford stability for the rooms. Geologic conditions and the limited lateral extent of reserves in the Tank Seam precludes columnizing of pillars with the other seams in some areas. However, experience has shown that the overburden (250') between these seams will provide adequate roof stability even if the pillars are not all columnized. The mining plan sequence allows for recovery of the upper seam areas (Tank Seam first, then Blind Canyon Seam) prior to final recovery of the lower seam. This procedure is consistent with accepted engineering practice in multiple seam mining.

Equipment Selection

Co-Op will utilize the equipment described in the following list for its mining operation and will acquire any additional equipment as required to maintain a sound mining operation.

Surface Equipment

- vibrating screens
- crushers
- conveyors
- front end loaders
- road grader
- crawler tractor
- fork lift

Recovery Rate

The recoverable coal reserves were estimated by multiplying the in-place reserve by a recovery factor of 70 pct.

The operation will produce 750,000 to 2,000,000 tons of raw coal per year with 2 to 4 miner sections working ~~240~~ 360 days. This is 3,000+ to 8,000+ tons per day with 2 to 4 production shifts operating. The rate of production (considering a lower rate during the initial buildup years plus the tonnage still to be mined in the area of old workings) will make the projected mine life approx 29 years.

Table 5-1 Coal Reserves - Bear Canyon Mine

Reserve Area	Seam	Coal Reserves (tons)	
		In-Place	Recoverable
Federal Lease <u>U-46484</u>	<u>Blind Canyon</u>	<u>5,093,206</u>	<u>1,586,852</u>
	<u>Hiawatha</u>	<u>7,015,758</u>	<u>3,085,990</u>
	<u>SUBTOTAL</u>	<u>12,108,964</u>	<u>4,672,842</u>
<u>(U-61048)</u>	<u>Tank</u>	<u>490,470</u>	<u>0</u>
	<u>Hiawatha</u>	<u>7,540,784</u>	<u>2,942,416</u>
	<u>SUBTOTAL</u>	<u>8,031,254</u>	<u>2,942,416</u>
<u>(U-61049)</u>	<u>Tank</u>	<u>10,027,191</u>	<u>6,433,459</u>
	<u>Blind Canyon</u>	<u>0</u>	<u>0</u>
	<u>Hiawatha</u>	<u>18,428,989</u>	<u>11,822,475</u>
	<u>SUBTOTAL</u>	<u>28,456,180</u>	<u>18,255,934</u>
<u>(U-024318)</u>	Blind Canyon*	65,363 <u>52,763</u>	12,600 <u>0</u>
	Hiawatha	<u>0</u>	<u>0</u>
	SUBTOTAL	65,363 <u>52,763</u>	12,600 <u>0</u>
<u>(U-024316)</u>	Tank	694,500 <u>1,099,006</u>	347,250 <u>0</u>
	Blind Canyon	Unknown <u>1,112,202</u>	Unknown <u>366,089</u>
	Hiawatha	Unknown <u>1,770,113</u>	Unknown <u>959,124</u>
	SUBTOTAL	694,500 <u>3,981,321</u>	347,250 <u>1,325,213</u>
<u>(U-020668)</u>	Tank	448,312 <u>600,036</u>	224,156 <u>318,706</u>
	Blind Canyon	<u>3,185,699</u> <u>2,647,894</u>	<u>1,592,850</u> <u>774,205</u>
	SUBTOTAL	3,634,011 <u>3,247,930</u>	1,817,005 <u>1,092,911</u>
<u>(U-38727)</u>	Tank	4,555,325 <u>4,300,059</u>	2,227,662 <u>2,958,627</u>
	Blind Canyon	<u>3,558,827</u> <u>3,779,496</u>	<u>1,592,850</u> <u>1,468,042</u>
	SUBTOTAL	8,114,152 <u>8,079,555</u>	4,057,075 <u>4,426,669</u>
Fee Land	Tank	7,304,476 <u>7,836,811</u>	3,652,238 <u>3,986,939</u>
	Blind Canyon	9,212,699 <u>9,395,909</u>	4,606,350 <u>3,808,970</u>
	Hiawatha	<u>2,568,465</u>	<u>1,284,232</u>
	SUBTOTAL	19,085,640 <u>19,801,185</u>	9,542,820 <u>9,080,141</u>
Total Area <u>Tons</u>	Tank	13,002,613 <u>24,353,573</u>	6,501,306 <u>13,697,731</u>
	Blind Canyon	16,022,588 <u>22,081,470</u>	7,991,213 <u>8,004,158</u>
	Hiawatha	2,568,465 <u>37,324,109</u>	1,284,232 <u>20,094,237</u>
TOTAL		31,593,666 <u>83,759,152</u>	15,776,751 <u>41,796,126</u>

NOTES: 1. Reserves based on latest projections (7/21/06/2/28/97) submitted to the B.L.M. in the L.M.U. Application R2P2 update.

2. Current permit application will allow for mining of Lease U-024316 in the Tank Seam only until additional hydrologic and geologic information can be obtained.

- Blind Canyon Seam reserves mined out in 1984-1985.

R645-301-524 Blasting and Explosives

C. W. Mining Company commits to follow all of the regulations in Section R645-301-524 that apply to its operation.

R645-301-525 Subsidence Control Plan

Subsidence monitoring points are shown on [Plate 5-3](#). [Appendix 5-C](#) contains the subsidence monitoring and control plan.

525-300 Subsidence Control

Subsidence control is outlined below and in [Appendix 5-C](#)

Barrier Pillars

Pillars of coal generally are left underground to protect surface or underground features which must be maintained and protected for the life of the mine (main entries) or permanently (oil or gas wells). The size of some is specified by law; others are designed by the operator to provide the protection needed. ~~Submains under the escarpment area in Bear Canyon will be left.~~

Property Boundaries

Area boundaries of individual leases and fee property are shown on [Plate 1-3](#). Protection of boundaries and property adjacent to the permit area is provided by continuous barrier pillars a min of 100 ft wide. This is wide enough to prevent subsidence across the boundary resulting from angle of draw. On the north end of the permit boundary no barrier will be left because this area is adjacent to the Hiawatha permit boundary which is part of the Bear Canyon LMU so mininng could potentially cross from one permit boundary into the other uninterrupted.

Outcrop Protection

In most areas, coal outcrops are buried and are not visible from the surface. Outcrops are either covered to some depth with overburden or, in many areas; the coal has been burned for some distance from the surface. Where neither of these situations exist, routine tests of the coal may show that it has been "weathered" or "oxidized" and mining will be stopped within 200 ft of the outcrop.

Barrier pillars to protect main and sub- main entries have been made large enough (100 ft or greater) to assure protection of the entries for their useful life. When the area serviced is mined out, entry pillars will be recovered on the way out.

Protection of Natural Surface Structures & Streams

C. W. Mining's commitment to maintain a min of 200 ft barrier pillars to outcrops where required by lease stipulations, or protection of streams and wildlife to minimize the possibility of escarpment failure and resulting detrimental impacts to down stream water quality or nesting raptor. Submains under the escarpment area in Bear Canyon will be left unless otherwise approved, no retreat mining will take place under the escarpment areas, which are outside of the potential subsidence zones shown on Plate 5-3. The primary natural structures that need protection are escarpments and streams. Escarpment locations are shown on Plate 5-3 and 5-3A, and a discussion of their protection is included in Appendix 5C. The only stream channels which lies over the minable portion of the permit area is Bear Creek, where it flows through Federal Lease [U-024316](#), and Fish Creek where it flows through a portion of Federal Lease [U-61049](#) and private property. See [Appendix 5-C](#) for an explanation of the protection zone delineation and method of protection. Adequate barrier zones will be left to protect adjacent stream channels, such as Bear Creek. Downstream channels are protected from disturbed area runoff contamination by utilization of sediment ponds. Temporary sediment controls i.e.; silt fences, straw bail dikes, etc. will be installed and vegetation will be reestablished as required in the event of impacts by escarpment failure.

In areas where coal burn exists the burning of the coal as caused natural subsidence causing failure of some natural structures. A barrier left adjacent to these areas would cause an interruption between the natural and man made subsidence creating greater impacts to the surface. Because of this no barrier will be left in these areas unless it is needed for roof stability or temperature considerations, in which cause the minimum possible size will be used.

Protection of Manmade Features (Surface & Subsurface)

Man made features and structures which exist on the minable portion of the permit area consist of a hunting lodge which exists in the Wild Horse Ridge Area. There are some forest trails but they are all located beyond the coal outcrops. Maximum coal recovery in the controlled uniform manner planned for this mine should result in even surface subsidence with minimal disturbance.

Buildings within 1,000 ft of Permit Area. A hunting lodge lies within 1,000 ft. of the permit area. Adequate barrier protection will be provided to prevent subsidence of this structure. No buildings have been identified above the potential subsidence zone.

Existing Public Roads. The main access road to the property is a public road. It provides access from Huntington Canyon to the mine. The lease agreement between C.W. Mining and C.O.P Coal Development requires C.W. Mining to allow access through the mine site for representatives of the property owners and Forest Service. The access road to the Wild Horse Ridge area consists of an existing road used to access a private hunting cabin which is owned by Sportsman's, the lessee of the hunting rights to the property. The main road is posted with speed control and general traffic control signs. When mining has been completed, the roads which are not approved to remain for post-mining land use will be reclaimed.

Protection of Oil, Gas and Water Wells

There are no active or abandoned oil or gas wells within the permit boundary.

The material will then be returned underground and either crushed prior to transportation to use as underground road base material, or placed underground in dry areas in accordance with MSHA regulations. Samples will be taken during future development in accordance with [R645-301-623.100](#).

Roof and rock materials developed underground during mining and related tunneling activities will be placed underground. When relocation of these materials is required underground, they will be placed in "dry" areas where there are no active seeps, sumps or drippers.

Bear Canyon #3 and #4 Mines. Coal Mine Waste such as separated waste rock which is generated from the Wild Horse Ridge operation and can not be used as described above will be hauled to Hiawatha (C1/007/011) and placed in ~~Slurry Pond 5A~~ [Refuse pile 1](#) (MSHA ID# 1211-UT-09-00098 [02157-04](#)). All material placement will comply with the requirements of the Hiawatha Coal Company's Coal Mining and Reclamation Plan, Section R645-301-528.

Prior to being shipped to the Hiawatha Mine, waste material will be tested for acid and toxic properties in accordance with [Table 50-1](#). Any material found having acid and toxic properties will be disposed of in the Hiawatha ~~Slurry Pond 5A~~ [Refuse pile 1](#) in accordance with the Hiawatha MRP requirements for acid- and/or toxic-forming material. For sediment control, runoff from any material placed in the temporary storage area reports to and is contained in sediment pond "A".

R645-301-540 Reclamation Plan

R645-301-541 General

541.100 Reclamation of All Areas

Upon completion of mining on the permit area, [C.W. Mining](#) will reclaim all disturbed surface areas as diligently and rapidly as possible, to restore the property to pre-mining and/or alternative post-mining uses. All reclaimed areas will be maintained during the liability period for at least 10 years.

The initial step in the reclamation plan is to seal all large-diameter openings by backfilling these openings with non-combustible material (earth & small rock), adjacent to the portals. The seals will be designed such that mine drainage, if any, will not enter surface water bodies. For a more detailed description of the sealing of openings, see [R645-301-529](#), Sealing of mine Openings, Drill Holes, Wells, etc.

The next step in reclamation would be the removal of all surface structures, equipment and road blacktop. Once this has been accomplished, all solid waste generated in the abandonment operation will be collected and disposed of in an approved manner. Additional information concerning this aspect of the reclamation plan is present in [R645-301-541.300](#) (Surface Structures), and [R645-301-542.600](#) (Roads).