

All portals will be sealed when workings cease. Mining conditions in the future may warrant additional ventilation. Surface breakouts, from the seam, for ventilation will be made in Bear Canyon and may be made in Trail Canyon.

The current mining system employs room and pillar mining with continuous miners. Pillars are removed wherever possible. In the virgin coal areas, development will allow use of either room and pillar or Long-wall methods or a combination of both, with room and pillar preferred wherever feasible.

As the mine develops, main entries will be driven in sets of either four, five, or six, with barrier pillars separating each set. These main entries will run East to West and South to North, to the property boundary. Sub-main entries will run at right angles from the main entries to the limits of the property.

Overall, an advance-retreat mining system is projected for this mine with retreat mining employed prior to abandonment of each section.

Barrier Pillars

Barrier pillars will be left where required to protect entries and steep escarpments within the permit area. Possible escarpment failures and the subsidence wave caused by maximum coal recovery is expected to cause only minor damage that can be mitigated. Mining will be stopped a min of 200 ft (barrier pillars) from the surface to maintain stability of the surface in the places where coal outcrops occur.

3.4.1.2 Mining Methods

Mining at the Bear Canyon complex is done by continuous miners. The miners discharge into shuttle cars (diesel or electric) 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 - 100 ft centers to be driven to the property limits. Sub-mains consisting of five entries on 83 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 - 90 ft centers. This is referred to in areas of the MRP 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 3.4-1 and 3.4-2. Submains under the escarpment area in Bear Canyon will be developed and left.

As can be seen on Plates 3-4A and 3-4B, 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

Culinary water usage at the mine site does qualify as a public water supply and meets State of Utah primary and secondary water standards (Appendix 3-B).

3.5.3.1 Control Measures to Mitigate Impacts

No significant impacts to the ground water system are expected from the mining operation. The ground water monitoring plan, discussed in Chapter 7, will provide a means to follow the possible effect of the mining activities on the ground water system. No surface or ground water will be discharge into the mine under any circumstances.

If mine water is encountered at the working face, which on an area wide basis generally yields less than 10 gal./min. per active face, it will be collected in the face area and pumped to impoundments located within the mine. The impoundments will be designed to allow sufficient time for suspended solids to settle. If necessary, mechanical devices will be installed to remove grease and oil that might be present in the water before it is used for dust suppression.

The construction of proposed surface facilities will result in increases of the suspended solids concentration. Increases, however are expected to be temporary because of compliance with the regulatory requirements that sediment control features be provided for all areas of surface disturbance.

SUBSIDENCE CONTROL AND MONITORING PLAN

SUBSIDENCE

Subsidence can normally be expected to occur over areas where second mining has taken place (pillaring). See Section 3.4 for mining operation. Based on the geologic interruptions within a mine, subsidence becomes very difficult to predict, due to the variable nature of the mining panels. However, Figure 3H-1 will give an estimate of the maximum subsidence that may be expected in mine studied in the Western U.S. Maximum subsidence for an average panel in the Bear Canyon Mine has been estimated from Figure 3C-1, using the criteria shown in Table 3C-1. Subsidence has been estimated based on the number of seams mined in the area.

Past experience in this area shows no indication that subsidence would be this drastic. No actual subsidence has been noted from areas pillared as much as 40 years ago, and the subsidence monitoring network initiated in 1987, has shown only minor (0.47 ft max 1992) variations in elevation. Based on this, little, if any, detectable subsidence is expected to become apparent when mining under these depths. Some minor fracturing and an escarpment rock fall have been noted in the adjacent Trail Canyon Mine area, and although these are assumed to be mine-related, they occurred in areas of relatively low cover and unknown outcrop protection. Only minor fracturing has been noted in relation to the Bear Canyon Mine (see Plate 3-3).