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TO: Technical File

FROM: ~~Leland~~ C. Spencer, Reclamation Mining Engineer

RE: Draft T. A. Subsidence, Boyer Mine, Summit Coal Company, PRO/043/008, Summit County, Utah

UMC 817.121 Subsidence Control

Applicant's Proposal

The applicant plans to mine the Wasatch Coal Seam from the Chalk Creek Member of the Cretaceous Frontier Formation. The coal seam overburden is carbonaceous sandstone to shale. The mine is projected for room and pillar mining utilizing continuous miners. The layout is typical with mains driven down dip and panels developed on strike. The layout has been modified to parallel property boundaries and avoid the old workings. The submains will be turned off at 45 degrees to the dip to parallel the northern property boundary reducing the grade from 17% to 12%. Mining projections show that mining will be limited to development of submains for the first two years through 1989 before the first panel will be driven south west along strike toward the outcrop. The first pillar extraction will be begin under 200' of cover.

The applicant expects subsidence over a long term and has indicated maximum extraction. The surface above the mining operation is owned by the applicant and the applicant indicates no structures and no renewable resource lands. The lands are presently used for grazing and wildlife habitat. No springs are indicated above the mining operation. No known aquifer exists above the immediate coal zone.

The applicant projects that there does not appear to be any structures or renewable resources in existence above the potential mining area, within or adjacent to the permit area, that would suffer material damage or diminution.

On the applicants projection map, Plate 3-2, the applicant has provided for a maximum angle of draw to within 10' of the power line running parallel and 50' north of the center line of Highway 133. The angle of draw projected from the vertical is 18 degrees.

The applicant proposes to mitigate subsidence impacts as they occur including (1) Not pulling pillars in selected sensitive areas (2) Uniform extraction to minimize impacts. Further the applicant includes mitigation to site specific impacts by road repair and fence repair, conveyance and diversion of flows, filling cracks wider than 6 inches, and revegetation.

Impacts will be monitored by an annual visual field survey to identify observable subsidence.

Compliance

The applicant has established that no known structures, perennial streams or springs exist within the limits of mining, however since the lands are used for wildlife and grazing, the lands subject to subsidence are strictly speaking renewable resource lands. Assuming complete pillar recovery the surface would experience subsidence between 60 and 90% of the seam height. No inflows should be expected from the alluvium of Chalk Creek since this aquifer will not be subsided.

The applicant's plans are consistent with the standard methods of mining and with the following clarifications and stipulations the applicant's subsidence control plan will comply to the extent "technologically and economically feasible to prevent subsidence from causing material damage to the surface and to maintain the value and reasonable foreseeable use of surface lands".

Stipulation 817.121(1-2) - LS & DD (Maximum recommended)

1. The following additions to the subsidence control plan shall be followed to minimize impacts to surface lands from subsidence:

   A. To protect the Highway 133 and the powerline the surface permit boundary will be maintained no less than 10' north of the powerline or 50' from the center line of highway 133 which ever is less. Along this southern boundary, due to the uncertainty of the angle of draw and in the interest of prudence, the applicant will utilize an angle of draw of 25 degrees (from the vertical) to determine the underground limit of second mining (pulling pillars). Before any secondary mining begins and then each year following the applicant shall submit a certified mine map of his underground workings to verify compliance.

   B. Until the applicant can otherwise justify stable pillar design for partial extraction, partial extraction may be conducted beyond the second mining limit as follows:

Development mining assuming 18' roof spans and not more than the following extraction may be conducted.

Depth	Maximum Extraction	Centers
150' to 300'	51%	60' X 60'
400' to 600'	45%	70' X 70'
600' to 800'	40%	80' X 80'
800' to 1000'	36%	90' X 90'

Barrier pillars of a minimum of 150' width should be maintained for protection of main entries.

C. Due to the hazards and damage to the surface caused by plug caving, the applicant shall not pull any pillars under a minimum overburden depth of 150'.

D. Prior to initiating second mining and in the interest protecting the highway and power line, the applicant shall be required to install monuments between the line projected by a 65 degree angle of draw from the limit of second mining to the surface and the power line. The line of monuments shall be spaced at 0.1d and be maintained 1.4d ahead of second mining. Both horizontal and vertical measurements shall be taken. A certified survey of the monuments shall be provided to the Division prior to second mining and then thereafter annually until subsidence is complete.

E. Due to the possibility of subsidence initiating some instability along the southern slope above the highway, prior to second mining, the applicant shall submit a geotechnical analysis to verify that during and following mining a minimum factor of safety of 1.3 will be maintained for slopes above the highway.

F. Pillar extraction should be as uniform, complete, and rapid as safety allows to minimize fracturing of strata.

2. The applicant shall within 30 days of permit approval, commit to restoring areas impacted by subsidence-caused surface cracks or other subsidence features such as escarpments (not to include naturally occuring escarpments which are not a result of mining) which are of a size or nature that could, in the Division's determination, either injure or kill grazing livestock or wildlife. Restoration shall include recontouring of the affected land surface including measures to prevent rilling, and revegetation in accordance with the approved permanent revegetation plan in the MRP. Restoration shall be undertaken after annual subsidence survey data indicate that the surface has stabilized, but in all cases restoration and revegetation shall be completed prior to bond release.

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