

TECHNICAL ANALYSIS

California Portland Cement
Hidden Valley Coal Company
Hidden Valley Mine
INA/015/007, Emery County, Utah

December 8, 1986

UMC 785.19 Alluvial Valley Floors (JW)

The pad areas to be reclaimed which are adjacent to Ivie Creek, a perennial stream, encompasses less than 4 acres. No historical record of attempts to farm in this area exist, probably due to the extremely limited area.

Since the proposed reclamation operation does not include the extraction of coal nor significant physical disturbance of the surface or groundwater regime, and since the area would provide negligible support to agricultural production, the requirements of UMC 785.19 (d) and (e) are not applicable and are hereby waived.

UMC 817.13-15 Casing and Sealing (PGL/JW)

Applicant's Proposal

There are four shallow exploration adits in the Hidden Valley Mine permit area (page 13). Incombustible material will be backfilled into each adit at least 25 feet. There are seven exploration drill holes associated with the Hidden Valley Mine. Four of these holes encountered artesian flow, were cased and completed as water wells. Valves were installed, wrapped with insulation, covered and buried. An inspection on July 31, 1986 determined that there has been no leaking from the four flowing holes. The water rights for these four holes (drill holes #1, 2, 3 and 7) have been extended through January 31, 1988 (shown in plan as an attachment) by the Division of Water Rights.

There are three dry exploration holes. Drill hole #4 was not found. Drill hole #5 will be plugged with a five-foot surface plug and drill hole #6 was found to be cemented to the surface with a survey marker installed in the plug.

Compliance

The applicant's proposal to backfill the exploration adits with at least 25 feet of incombustible material is

acceptable, because the adits are shallow and undeveloped. Therefore, the requirements for block seals have been waived in this case.

The dry drill holes will be plugged with five feet of surface cement. The fourth drill hole will be located at the time of reclamation, if possible, and will be plugged with five feet of surface cement (page 16a, PAP).

Drill holes #1, 2, 3 and 7 are part of Hidden Valley Coal Company's water rights that have been extended until January 31, 1988. If the water rights are terminated, then abandonment procedures as required by the Utah Division of Water Rights Administrative Rules for Water Well Drillers will be undertaken within 90 days of the date of final notice on the water right. If the water rights are transferred, Hidden Valley Coal Company will follow the procedures in 817.53 for transfer of water rights (page 16-a, PAP).

The applicant will comply when the following stipulation is met.

Stipulation 817.13-15 (1)-JW

Within 30 days of permit approval, the applicant must commit to plug and abandon the drill holes #1, 2, 3 and 7, according to the procedures described in the Utah Division of Water Rights' Administrative Rules for Water Well Drillers upon abandonment of the wells unless these holes are transferred according to the requirements of UMC 817.53.

UMC 817.21 Topsoil: General Requirements (DD)

Existing Environment and Applicant's Proposal

One topsoil stockpile exists on the "B" seam pad. The stockpile consists of approximately 770 cubic yards, the material is a sandy loam with a calculated Ec of 2.43 and a SAR of 1.8.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.22-817.23 Topsoil: Removal and Storage (DD)

Existing Environment and Applicant's Proposal

The applicant does not propose to disturb any additional acreage, therefore no topsoil will be removed and stored. These sections are not applicable.

UMC 817.24 Topsoil: Redistribution

Existing Environment and Applicant's Proposal

The existing topsoil stockpile will be redistributed over the 2.1 acres of the "B" seam pad, at an approximately depth of 2.5 inches. Samples of the lower and upper "B" seam pad materials have calculated Ec values of 3.67 and 4.42 mmhos/cm³ and SAR values of 3.41 and 2.32 respectively.

The applicant states that the "A" seam pad and sediment pond were constructed of alluvial silt loams, rocky sandy loams and coal seam overburden material. There is no topsoil available for this pad so the existing mixture of materials will be used for the seed bed. The applicant also commits to salvaging the better soil materials as they are exposed during reclamation (page 53, MRP). A sample from the "A" seam pad had a calculated Ec of 4.15 and an SAR of 5.75.

Compliance

The proposed topsoil redistribution plan is in compliance with this section. The topsoil that was salvaged and that will be redistributed over the "B" seam pad will only cover the pad with approximately 2.5 inches. The sample analysis of the "B" seam pad material, which will be within the root zone of all plants, indicates that the material should not be limiting to plant growth, considering the species proposed for revegetation. The analysis of the "A" seam pad material also indicates that the material is a suitable plant growth medium, again considering the revegetation species proposed for the site.

Stipulations

None.

UMC 817.25 Topsoil: Nutrients and Soil Amendments

Existing Environment and Applicant's Proposal

The soil and pad materials are low in fertility; they lack sufficient cation exchange capacity and organic matter to provide the basic nutrients for plant growth. Phosphorous contents are especially low. Soil textures are sandy loams with saturation percentages at expected values for the sandy nature of these soils. However, the material should hold adequate water.

The applicant proposes to overcome the poor fertility and low organic matter contents of the soils by applying green alfalfa hay mulch at a rate of 4000 lbs./acre. Diammonium phosphate fertilizer will also be spread in the fall at the rate of 242 lbs./acre. This is equivalent to 48 pounds of N and 130 pounds of P_2O_4 per acre. The mulch and fertilizer will be covered by dragging operations. In the spring, 100 pounds of liquid urea will be applied per acre, which is equivalent to 46 pounds of N per acre. This spring application of urea is to compensate for increased soil microbial activity due to organic matter decomposition. The alfalfa hay mulch will supply approximately 96 pounds of N, 18 pounds of P_2O_5 and 81 pounds of K_2O per acre upon decomposition.

Compliance

Considering the precipitation regime and plant communities in the vicinity, the fertilization program appears somewhat excessive. The project consultant, however, has used similar reclamation plans on other comparable sites with excellent results.

The applicant is in compliance with the above section and the proposed fertilization plan is approved. The following alternative recommendations are also acceptable to the Division.

- (1) Diammonium phosphate is much more expensive than Ammonium phosphate with an analysis of (16-20-0). Ammonium phosphate is much more readily available. Ammonium phosphate (16-20-0) at the proposed rate of 242 lbs./acre would also supply 48 lbs./acre of P_2O_5 , which is recommended by Utah State University for soils with similar phosphorous contents.

- (2) Lowering the proposed rate of 242 lbs/acre of Diammonium phosphorous to 100 lbs./acre would also lower the P_{205} application rate to 54 lbs/acre, which is more in line with state recommendations and would be less costly.

Stipulations

None.

817.41-42 Hydrologic Balance (TM)

Applicant's Proposal

The applicant has proposed to monitor flow in Ivie Creek on a semi-annual basis according to the requirements of the post-mining monitoring guidelines (page 62-63, PAP). The location and description of these monitoring points is given on page 62A of the PAP. Water quality samples will also be secured at the discharge points from the reclaimed area to Ivie Creek during each runoff event encountered during scheduled monitoring visits (water quality and revegetation checks).

The channels existing previous to mining will be reconstructed and sediment control will be supplied during the reclamation bonding period. No reclamation activities will be conducted in the buffer zone except for the removal of culverts that empty into the creek and the subsequent restoration of channels (page 64, PAP).

Compliance

The applicant complies with the requirements of these sections. The applicant proposes to reclaim all culverted or disturbed ephemeral channels within the permit area to meet design specifications of UMC 817.44. All sediment pond control structures (i.e., sediment pond) will be removed during reclamation and replaced with berms and silt fences to adequately control sediment during the reclamation period until the site has become stabilized. The road leading into the site will be reclaimed and waterbarred to minimize erosion and water pollution (see 817.160-166). All reclaimed channels, exhibiting excessive velocities, will be riprapped in the appropriate sections to minimize water pollution. Through the use of alternative sediment controls, the applicant has demonstrated that he will meet all applicable state and federal effluent limitation standards.

Stipulations

None.

UMC 817.43-45 Hydrologic Balance: Stream Channel Diversions (EM)

Applicant's Proposal

The specifics of stream channel reclamation are spelled out by the applicant on pages 28-34 of the PAP. The 250 feet of 48-inch diameter culvert in the B seam pad will be removed and the ephemeral channel restored to an approximately natural grade. The gradient will be uniform at 10.5 percent, the sideslopes will be at 4h:1v, and the bottom width will be 10 feet. For any section of the channel not resting on bedrock, the fill will be riprapped to protect against erosion (page 29, PAP).

The access road leading to the site will be reclaimed and waterbarred to prevent erosion. Two culverts will be removed during the reclamation of the road. A 48-inch culvert located at the crossing of the ephemeral channel (see Plate V) will be removed and a channel excavated to allow fording of the creek. This channel is expected to rest on bedrock. The gradient of this channel will be the same as the culvert (0.071 ft./ft.) (page 51, PAP).

As the road and A-seam pad are regraded, an 18-inch culvert will be removed. With the filling in of the roadside ditch, the normal drainage to the 18-inch culvert will be diverted.

With the re-establishment of the ephemeral channel, regrading of the access road and the A-seam pad, the area draining to the sediment pond will be quite small, less than one acre. The sediment pond will be removed and the area draining the A-seam pad will be allowed to flow through the pond area into Ivie Creek after the discharge structures associated with the pond are removed. This drainage will be passed via triangular ditch through a silt fence (page 33, PAP).

Compliance

The applicant has demonstrated compliance with this section through the appropriate design calculations for channel restoration and through the use of sediment control, consisting of berms and silt fences along the edge of the regraded slopes and the ephemeral channel. The combination of channel, bed, and bank and flood plain configurations

are adequate to pass safely the peak runoff of 100-year, 24-hour precipitation event for all restored channels. All restored channels have been designed to prevent additional contributions of suspended solids to streamflow or runoff outside the permit area. Any runoff leaving the permit area will not be in excess of State or Federal standards.

Stipulations

None.

UMC 817.46-47 Hydrologic Balance: Sediment Ponds (TM)

Applicant's Proposal

The applicant has proposed to remove the existing decant structures from the sediment pond and breach the embankment to form a channel to Ivie Creek. Due to the layout of the site, very little drainage area, less than 1 acre, will contribute to the pond, following backfilling and grading of the site. Due to the arid climate and the lack of significant runoff, the applicant proposes to use alternative sediment controls (i.e., berms and silt fences) to control sediment from leaving the site.

Compliance

Based on past observation of the runoff characteristics of the site and the final site configuration, removal of the sediment pond is appropriate. No runoff will leave the disturbed area without prior treatment to prevent additional contributions of suspended sediments from entering the surface waters of Ivie Creek.

Considering the small drainage area and the runoff characteristics of the final site configuration, the sediment control plan during the reclamation phase is considered complete and adequate to meet the requirements of this regulation.

Stipulation

None.

UMC 817.49 Permanent and Temporary Impoundments (TM)

Applicant's Proposal

No temporary or permanent impoundments will be left on site. The current sediment pond will be breached and rendered ineffective.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring (TM)

Applicant's Proposal

Surface flow to Ivie Creek, a perennial stream, will be sampled and measured semi-annually, during the months of May and September. No groundwater sampling is planned since there was virtually no underground development and no mine water discharge. Water quality will also be sampled at discharge points (i.e., outlets to all restored channels) from the reclaimed area when flow is observed and at the two established monitoring points on Ivie Creek (page 62a, PAP).

Compliance

The applicant complies with the requirements of this section and the Division's water monitoring guidelines.

Stipulations

None.

UMC 817.53 Transfer of Wells (TM)

Applicant's Proposal

The applicant proposes to maintain the current drill holes 1, 2, 3 and 7 in their current condition. Drill hole #4 was not found. Drill hole #6 was found to be cemented to the surface with a survey marker installed in the plug. Drill hole #5 will be plugged with a five-foot surface plug during reclamation work to be conducted during the fall of 1986. Water rights for drill hole 1, 2, 3 and 7 are in place until January 31, 1988.

Compliance

The applicant is in compliance with this section until such time that these wells are transferred, then the applicant must meet the requirements spelled out under UMC 817.13 through 817.15.

Stipulations

None.

UMC 817.55 Hydrologic Balance: Discharge of Water into an
Underground Mine (TM)

Applicant's Proposal

The applicant will fill and close all exploration adits at the underground mine during reclamation (see 817.13-15).

Compliance

Since all underground openings will be sealed, no runoff will enter or leave these openings; therefore the applicant is in compliance with this section.

Stipulations

None.

UMC 817.56 Hydrologic Balance: Post Mining Rehabilitation of
Sedimentation Ponds, Diversions, Impoundments, and
Treatment Facilities (TM)

Applicant's Proposal

The applicant will re-establish natural conveyance of surface waters through the permit area. The sediment pond will be breached during reclamation and therefore will not be considered an impoundment (page 63, PAP).

Compliance

The applicant meets the requirements of this section.

Stipulations

None.

UMC 817.57 Stream Buffer Zone (TM)

Applicant's Proposal

Reclamation activities which will occur in the buffer zone are limited to removal of culverts that empty into the creek and the restoration of ephemeral channels which flow into Ivie Creek. Silt fences will aid in controlling sediments in these sensitive areas.

Compliance

Since the applicant will be restoring drainage through the disturbed area to Ivie Creek based on the requirements of UMC 817.43 and UMC 817.44, and water quality and quantity will not be adversely affected, then the applicant is in compliance with this section.

Stipulations

None.

UMC 817.71-74 Disposal of Underground Development Waste and Excess Spoil and Non-Acid and Non-Toxic Coal Forming Coal Processing (PGL)

This section is not applicable as there was never any underground development waste generated at this site.

UMC 817.81-88 Coal Processing Waste Banks (PGL)

This section is not applicable, as there was never any coal processing waste generated at this site.

UMC 817.89 Disposal of Non-Coal Wastes (PGL)

Applicant's Proposal

The applicant describes how non-coal wastes will be handled during reclamation on page 50a. A waste bin will be located onsite for the disposal of solid and liquid wastes. The non-coal waste will be hauled off-site to an approved landfill for disposal.

Compliance

The applicant will dispose of non-coal wastes in an acceptable manner. The applicant complies with this section.

Stipulations

None.

UMC 817.91-93 Coal Processing Waste: Dams and Embankments (PGL)

This section is not applicable as there was never any coal processing waste generated at this site.

UMC 817.95 Air Resources Protection (PGL)

Applicant's Proposal

The applicant describes fugitive dust emissions control during reclamation operations in Appendix i, page 7, (Air Pollution Control Plan) and on page 17a. This is a remote, protected canyon. During periods of winds in excess of 50 mph, reclamation work will be delayed until winds abate.

Compliance

The applicant has committed to appropriate fugitive dust control measures during reclamation. The applicant complies with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values (KMM)

Existing Environment and the Applicant's Proposal

The resident wildlife population consists of small mammals, birds and reptiles and their predators. An active prairie falcon nest across Ivie Creek from the mine site represents the only sensitive species known in the area. An owl which nested in the vicinity of the adits could not be relocated.

Compliance

Since the site is being reclaimed, negative impacts on wildlife should be minimal. Revegetation of the unproductive site will enhance wildlife habitat, providing additional food and cover. Reclamation is scheduled for autumn and should not adversely impact the spring nesting falcon. Development of water sources for wildlife enhancement is not appropriate at this site since the mine is adjacent to a perennial creek which will not be impacted by the reclamation activities. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage

Applicant's Proposal

The applicant has committed to mitigate any slide damage on the permit area during the bond liability period (addendum page 7, PAP).

Compliance

Applicant complies with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading: General (PGL)

Applicant's Proposal

The exposed coal seams will be graded to a slope of approximately 2h:1v. Slopes will be covered with 2" of topsoil. Backfill volumes will be about 11,000 cubic yards (page 18, PAP).

Compliance

A minimum static factor of safety of 1.35 was demonstrated for the backfilled highwalls (Appendix VII-Slope Stability Analysis, PAP). The applicant, however, did not specifically detail recontouring of the sediment pond. The applicant will comply when the following stipulation is met.

Stipulation 817.101-(1)-PGL

The sideslopes of the sediment pond shall be reduced to at least a 3h:1v slope during final reclamation and recontouring of the pond area.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid-Forming and Toxic-Forming Materials (PGL/DD)

Applicant's Proposal

The applicant will cover the exposed A and B seams to a slope of approximately 2h:1v (page 18). The slopes will then be covered with approximately 2 inches of topsoil and revegetated.

If any coal or acid- or toxic-forming materials are discovered during excavation and backfilling, they will be placed against the coal seams and covered with non-toxic materials (page 27).

The only material on-site which could be considered acid-forming or toxic is the coal. Tests on the coal quality (Appendix VI of the MRP) shows one sample has a total sulphur content of 3.94 percent, with no carbonates. Two other samples had contents of .4 and 1.19 percent. Ec of the coal was 6.1, 8.2 and 10.9 with SAR of 45.6, 6.2 and 4.8. Selenium and Boron are low for all samples. Although the coal materials may be considered acid-forming and saline, these materials are not readily evident on the site. The applicant commits to placing any material that may be toxic or acid-forming, that may be exposed during excavation, against the coal seam and backfilled with non-toxic materials (page 27, MRP).

Compliance

The only evident coal on the site is the exposed coal outcrop. The outcrop will be backfilled with non-toxic material. Since any potential acid-forming or toxic material that is exposed during excavation will be placed against the highwall and backfilled with non-toxic material, the applicant is in compliance with this section.

Stipulations

None.

UMC 817.106 Regrading or Stabilizing Rills and Gullies (PGL)

Applicant's Proposal

The applicant committed to repair rills and gullies throughout the bond liability period on page 27 of the PAP.

If there are persistent rill and gully sites, they will be stabilized with small gabions or rock-check dams (page 27, PAP).

Compliance

Applicant complies with this section.

Stipulations

None.

UMC 817.111 Revegetation: General (KMM)

See specific sections.

UMC 817.112 Use of Introduced Species (KMM)

Existing Environment and Applicant's Proposal

The revegetation seed mix contains seven native and three introduced species (i.e., Yellow sweetclover, Russian wildrye and Crested wheatgrass; p. 58-59).

Compliance

Yellow sweetclover is used for its nitrogen fixing value and should also serve as a nurse crop for the slow growing natives. Small amounts (one pound each) of Russian wildrye and Crested wheatgrass are included to assist in erosion control while the natives are becoming established. Nearby test plots have demonstrated that they are adapted to the area. They will provide food and cover for small animals and add diversity to the vegetation community until local natives invade. Since they are already established on site from old stabilization seedings and are being planted in small quantities, they should not be overly competitive. They are not considered poisonous or noxious. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing (KMM)

Existing Environment and Applicant's Proposal

The applicant proposes to seed in late fall (p. 59).

Compliance

Late fall is the appropriate time to seed in this locality. The proposal is in compliance with this section.

Stipulations

None.

UMC 817.114 Revegetation: Mulching (KMM)

Existing Environment and Applicant's Proposal

The applicant proposes to mulch with 4000 lbs. of alfalfa anchored with soil dragged over the hay or secured on steep slopes with erosion control netting (p.59).

Compliance

If covered in place, the alfalfa hay should be an important addition to the substitute soil of the reclamation project. The applicant will be in compliance with this section if the alfalfa can be adequately secured with a covering of dirt. Where the alfalfa cannot be secured in that manner, it will be secured with netting (e.g., on steep slopes).

Stipulations

None.

UMC 817.115 Revegetation: Grazing (KMM)

Existing Environment and Applicant's Proposal

Livestock grazing is limited in the area and will be limited further by fences on the access road and Ivie Creek (p. 56, 59 and Plate III). While these fences will not restrict wildlife or significantly reduce grazing, they will prevent livestock trampling damage on the revegetation area.

Compliance

There are currently no plans for permitting grazing during the last years of the bonding period. This will not represent any major difference between management of the mine site and adjacent areas, and will be in concert with the proposed post mining land use. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.116 Revegetation: Standards for Success (KMM)

Existing Environment and Applicant's Proposal

Revegetation success will be based on comparison of the mine area to a reference area established in the "Steep rocky slope" vegetation type. Qualitative monitoring will be done

monthly for the first two years and annually thereafter. Line intercept transects will be used in year three to check vegetation progress to determine the need for reseeding. The area will be quantitatively sampled for cover, density and productivity in years nine and ten of the bond period (p. 60-61).

Compliance

The applicant has chosen a reasonable reference area and sampling techniques for comparison with revegetated areas. Monitoring should be adequate to determine problem areas and initiate remedial action. Cover, density, and productivity will be sampled to determine success of revegetation because post mining land uses include grazing and wildlife habitat. The extended liability period will be for 10 years after the last augmentation of revegetation since the mine site receives less than 26 inches of precipitation. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.132 Cessation of Operations: Permanent (PGL)

There was no underground mining at this mine. Development ceased in August, 1980.

UMC 817.133 Postmining Land Use (KMM)

Existing Environment and Applicant's Proposal

Cattle grazing and wildlife habitat are the main land uses adjacent to the mine area. Cattle grazing is limited to 1 AUM per 10 acres. Both uses are proposed as post mining land uses although cattle grazing is likely to be only an occasional use especially in the relatively steep disturbed area. The primary purpose of revegetation will be to stabilize the site.

Compliance

The post mining land use is comparable to pre-mining uses and is compatible with other uses in the area. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-156 Roads: Class I (PGL)

Applicant's Proposal

The Class I haul road was constructed with public funds and is dedicated to Sevier and Emery counties (the ROW documents are found in Appendix I).

Compliance

The proper documents for transfer, ownership and maintenance of the public road are contained in the PAP. Applicant complies with this section.

Stipulations

None.

UMC 817.160-166 Roads: Class II (PGL)

Applicant's Proposal

The applicant's as-built road alignment is shown in Figure 6.1: Appendix D. The applicant addresses closing the road, drainage patterns being restored, and roadbeds being ripped, scarified and revegetated. A "road closed" sign will be placed at the terminus of the paved road. A 3-wire, 42-inch high barbed wire fence tied to the ledges across the upper portion of the road to prevent access will be constructed.

This fence will be checked during each site visit and maintained as required to retain the integrity of the fence. The 48-inch and two 18-inch diameter culverts will be removed and the natural ephemeral drainage restored and stabilized. Eleven water bars will be spaced according to Table 3b and located on the ripped roadbed according to Plate III. Existing soil material will be used as the growing medium with properly prepared mulching and fertilizing practices. The roadbed will be ripped and scarified prior to revegetation.

Compliance

The roadbed will be ripped and scarified and the fence and gate will prevent access to the property. The restoration of the road meets the reclamation standards of UMC 817.166. Applicant complies with this section.

Stipulations

None.

UMC 817.170-176 Roads: Class III (PGL)

There are no Class III roads on the site, therefore this section is not applicable.

UMC 817.180-181 Transportation Facilities and Other Support
Facilities and Utility Installations (PGL)

There were no facilities constructed, therefore, this section is not applicable.

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