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September 13, 1988

TO: FILE

FROM: Rick P. Summers, Reclamation Hydrologist
Mike DeWeese, Reclamation Hydrologist

RE: Technical Analysis, Soldier Creek Coal Co., Banning Loadout, ACT/007/043, Folder #2, Carbon County, Utah

UMC 817.41 Hydrologic Balance: General Requirements-MMD

Existing Environment and Applicant's Proposal

The Banning Loadout permit area is located in the Grassy Trail Creek watershed in an unnamed tributary drainage basin. Grassy Trail Creek is classified as an intermittent stream with most of the annual flow occurring during the spring runoff. There are no perrenial streams in the vicinity of the loadout and the annual water yield of the area is very low, therefore the operation will have little effect on the existing surface water regime. Water quality of surface and groundwater in the permit area is poor with high concentrations of dissolved solids. The loadout facility is underlain by the Mancos Shale formation which has a low permeability and acts as an aquatard. The permit area is considered to be a poor recharge source for groundwater, and the operation will have a negligable effect on the existing groundwater regime.

The applicant proposes to control surface runoff from the disturbed area by using a combination of berms, culverts, diversion ditches, a sedimentation pond and a small containment dike. With the exception of a small area in the southeast corner of the loadout facility and an area classified as a closed basin (Exhibit 5.2-1), all loadout disturbed area drainage will be routed to the sedimentation pond for treatment prior to discharging into the natural drainage system. The applicant proposes to install berms around the perimeter of the disturbed area. These berms have been adequately designed to safely contain and pass the predicted runoff from a 10 year - 24 hour precipitation event. Division analysis of the system has demonstrated that the expected flow velocities produced by such an event are non-erosive, therefore no channel lining is required for these structures.

The proposed sedimentation pond is adequately sized to contain the 25 year - 24 hour precipitation event runoff and a ten year sediment volume (Appendix II, Vol. 2, PAP). The applicant proposes to contain disturbed area runoff from a small area (0.12 acres) in the southeast corner of the facility using a small containment dike outside the bermed area.

Compliance

The operator has proposed designs utilizing the best available technology to minimize impacts to the existing water quality in the permit and adjacent areas. The following sections of this analysis contain detailed discussions of the applicant's proposal. The applicant's proposal will meet the general requirements for this section when the stipulations in these sections are met.

Stipulations

None.

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations-MMD

Existing Environment and Applicant's Proposal

The permit area is an intermittent drainage basin, with surface water flowing only during spring snowmelt runoff and during thunderstorms later in the summer. There are no continuous discharge records for this drainage because of the characteristic low flows. Research has shown the water quality of Grassy Creek to be poor with high concentrations of dissolved solids. This is primarily due to the mineralogy of the geologic formation underlying the area which contains large quantities of soluble salts.

With the exception of two areas, all surface runoff from the loadout disturbed area will report to the sedimentation pond. An area identified as a closed basin on Exhibit 5.2-1 will be contained within the entrance haul road and the loading dock. A small area in the southeast corner, which does not report to the pond, will be contained by a dike. Drainage from the access road between the loadout facility and U.S. Highway 6 shall be treated by a combination of straw bale dikes and silt fence check dams. The applicant has committed to installing these structures in the roadside ditches immediately upstream of any confluences with natural ephemeral channels. The applicant has committed to maintaining the access road culverts for the life of the operation.

Compliance

The applicant is in compliance with this regulation.

Stipulations

None.

UMC 817.43 Hydrologic Balance: Diversions And Conveyance of Overland Flow, Shallow Ground Water Flow, And Ephemeral Streams-MMD

Existing Environment and Applicant's Proposal

The applicant proposes to divert disturbed area runoff to the sedimentation pond by the previously described berms and diversion ditches. In addition, two culverts will be utilized to convey runoff across the loadout access road at the north and south gates. The Division has determined the proposed berm design to safely pass the expected runoff from the 10 year - 24 hour precipitation event at non-erosive velocities and with the required freeboard. The applicant has demonstrated that the diversion ditch design is adequate to pass the 25 year - 24 hour precipitation event runoff. However, the proposal contains no design for the culverts at the two access road gates.

Compliance

The applicant is not in compliance with this section. The applicant must include an adequate culvert design in the proposal demonstrating that the existing culverts will safely pass the design storm runoff.

Stipulation 817.43-(1)-MMD

1. Within 30 days of permit issuance, the applicant must submit an adequate culvert design to the Division for the culverts at the north and south gates of the access road. This design must demonstrate that the existing culverts will safely pass the 10 year - 24 hour precipitation runoff. The exact location of these culverts must be included on an appropriate map and included in the proposal.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions-RPS

Existing Environment and Applicant's Proposal

The proposed operation is located within the Grassy Trail Creek watershed. The site is developed on the relatively low slope alluvium underlain by the Mancos shale. The slope of the site and surrounding permit area is approximately 1 - 4 percent. A small ephemeral tributary to Grassy Trail Creek is located adjacent to the northwest corner of the permit area (reference U.S.G.S. Sunnyside Junction, Utah Quadrangle and Exhibit 2.1-1). The proposed site will not disturb this channel. A small gully that has developed subordinate to that unnamed tributary will be repaired in conjunction with the installation of the proposed sedimentation pond (Exhibit 5.2-1).

Compliance

This regulation is not applicable to this proposal. The applicant is in compliance.

Stipulations

None.

UMC 817.45 Hydrologic Balance: Sediment Control Structures-RPS

Existing Environment and Applicant's Proposal

The operation will result in approximately 26.1 acres of disturbance. Surface drainage from this disturbance will be treated using a sedimentation pond, a containment berm, two diversions, and a dike. The haulage road drainage will be treated using silt fences and/or straw bales.

The topography at the site and surrounding area is low slope with very little defined drainage. The applicant has proposed to install a berm around the entire perimeter of the loadout disturbed area. The berm will serve to segregate the disturbed area and undisturbed area drainage. A sedimentation pond has been proposed to treat 15.5 acres of drainage (Exhibit 5.2-1). A portion of the disturbance will be contained within the area between the in-haul road and the loading dock and will not report to the sedimentation pond. The existing grade at the site results in a low area in the southeast corner of the permit area that will be unable to report to the sediment pond. The drainage from this area will be contained within a dike.

Compliance

Considering the topography at the site and the dynamic nature of the operation (i.e. site is continually regraded as coal is stored and removed), the Division believes the applicant's proposal is a reasonable solution to provide maximum sediment control while maintaining site flexibility. The proposal provides for complete containment and/or treatment of all runoff from a 10 year - 24 hour precipitation event without establishing a potentially unworkable static drainage system. The applicant is in compliance with this regulation.

Stipulations

None.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds-MMD

Existing Environment and Applicant's Proposal

The applicant proposes to construct a new sedimentation pond at the loadout facility at the existing pond location on the southwest corner of the site. The new pond will be primarily incised, with a maximum embankment height of six feet above the existing ground surface (page 5-12). Construction of the new pond will basically expand the existing pond and will retain the sediment control function of the pond during the construction process.

The applicant has demonstrated that the pond is adequately designed to contain 10 years of sediment volume and will completely contain the predicted runoff from the 10 year - 24 hour precipitation event (Appendix II, page 3). Two sediment level markers will be placed in the pond to determine the 60% sediment cleanout level. The proposed design implements a drop inlet primary spillway structure, a two inch diameter dewatering device, and a broad crested emergency spillway structure. The emergency spillway crest will be at an elevation of 5495.2, one foot above the primary spillway crest elevation of 5494.2 feet. The applicant has adequately demonstrated that the primary spillway will convey the runoff from the 25 year - 24 hour precipitation event at a maximum water level below the emergency spillway crest (Appendix II, page 12).

The emergency spillway has been included in the sediment pond design as a conservative safety measure. The applicant has demonstrated that the emergency spillway capacity is adequate to safely pass the complete runoff from the 25 year - 24 hour precipitation event. The applicant's emergency spillway calculations use a Manning's n value of 0.03 (Appendix II, page 13). The Division feels a value of 0.020-0.025 would be more applicable to site conditions. However, the proposed pond design is determined to be justified because:

1. The pond is over-designed for capacity.

2. The pond embankment height at the emergency spillway is very low, therefore failure of the spillway would not result in failure of the actual pond structure.

3. The slope of the emergency spillway exit channel is to be the same as the existing ground slope (2.5%).

4. The probability of primary spillway failure due to clogging is considered low due to the sparcity of debris in the area. Therefore, the emergency spillway will only function in the event of an extreme storm event (greater than the 25 yr. - 24 hr. event)

The applicant has demonstrated that the proposed inlet channel design will safely pass the 25 year - 24 hour precipitation runoff (Appendix II, page 23). The applicant proposes to riprap the inlet channel sections down the northeast and southeast corners of the pond embankment. The proposed riprap design (d_{50}=6 in.) and filter blanket material have been shown to be stable during the 25 year event.

The applicant commits to constructing the pond embankment to a minimum width of (H+35/5) or 8.2 feet as shown on Exhibit 5.2-2. The inside embankment slope will be constructed at 3:1 and the outer slope at 2:1 (Exhibit 5.2-2). Page 5-12 of the proposal states that the dam will be constructed to a maximum height of 5496.5 feet to allow for 0.3 feet settlement. The proposed primary spillway design includes installation of two anti-seep collars on the barrel of the spillway. Calculations on page 30, Appendix II determine a collar width of 3.4 feet, yet Exhibit 5.2-3, detail "E" shows the collar size to be two feet. This discrepancy must be corrected.

Compliance

The applicant has not committed to preparing the embankment foundation to the specifications of UMC 817.46 (n). The applicant has not committed to constructing the dam using material free of vegetative matter as required by UMC 817.46 (o). A stipulation on these items is not warranted, but the operator should realize these are performance standards that must be met during construction.

Stipulations 817.46-(1)-MMD

The applicant must install 34 inch anti-seep collars on the primary spillway of the sedimentation pond. The submittal of certified as-built drawings must correct the collar size discrepancy found in Appendix II of the MRP (page 30 and Exhibit 5.2-3).

UMC 817.47 Hydrologic Balance: Discharge Structures-RPS

Existing Environment and Applicant's Proposal

The proposed drainage system consists of two discharge points at the pond inlets and two discharge points in the natural drainage channel at the outlet of the primary spillway and the decant pipe. No other discharge points will exist on site.

On page 5-9 of the PAP the applicant commits to installing riprap aprons at the primary spillway and decant pipe outlets. Calculations in Appendix II (page 1) determine the riprap d_{50} to be 1.1 inches. These calculations assume the pipe is flowing full at the outlet. As a conservative measure the applicant calculated the tailwater depth at a point three feet downstream from the outlet. Therefore, the methodology outlined by the U.S.E.P.A (1976) is applicable for this system. The proposed design requires an apron length of 9.5 feet, and an apron width of 5.3 feet. The applicant proposes a six inch filter blanket with a maximum d_{50} of 0.28 inches and a minimum d_{50} of 0.008 inches.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments-RPS

Existing Environment and Applicant's Proposal

A single sedimentation pond located in the southwest corner of the permit area is proposed for the site. The proposal commits to reclamation of the pond when drainage water quality and revegetation requirements are met (section 3.4, PAP). The pond is partially excavated with interior sideslopes of 2:1. The proposal includes erosion protection at all inlets to the pond (Exhibit 5.2-2). The disturbance associated with the pond construction will be revegetated upon completion of pond construction (section 5.2.2). The proposal commits to submitting an as-built report of the construction certified by a registered professional engineer following completion of pond construction (section 5.2.2).

Compliance

The applicant's proposal meets the requirements of this regulation.

Stipulations

None.

UMC 817.50 Hydrologic Balance: Underground Mine Entry And Access Discharges-RPS

UMC 817.55 Hydrologic Balance: Discharge Of Water Into An Underground Mine-RPS

Existing Environment and Applicant's Proposal

The entire proposed operation consists of the processing and loading of coal. No mining is proposed for this operation.

Compliance

These regulations do not apply to this operation. The applicant is in compliance.

Stipulations

None.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring -RPS

Existing Environment and Applicant's Proposal

The existing water resources in the vicinity of the site are considered to be of marginal importance due to existing low water quality. Waters in the area are heavily influenced by the Mancos shale formation which dominates the entire region. Water quality in the region tends to be characterized by high concentrations of total dissolved solids. Samples from Grassy Trail Creek upstream from U.S. Highway 6 had total dissolved solids concentrations ranging from 872 to 2510 milligrams per liter (section 5.1.1, PAP) Natural surface drainage channels in the permit area do not exist. Groundwater exists to some extent in the relatively low permeable Mancos shale. Although the application does not present site specific data for the area, research by Waddel, 1981 and Hood and Patterson, 1984 is cited in the PAP. Transmissivities in the Mancos shale tend to be low and water quality is considered to be poor (section 5.1.2).

Operations proposed for the site consist of activities on the surface only. Coal will be processed, stored, and loaded at the site. Surface waters from the loadout area will largely report to the sedimentation pond for treatment. The applicant has applied for an NPDES permit and commits to monitor all discharges from the pond. The applicant proposes to monitor discharges occurring through the straw bales and silt fences along the haulage road as occurrence of runoff allows (section 5.3.1, PAP).

Due to the type of operations at the site, the only expected impacts to the groundwater resource would be leachate of precipitation from the coal storage areas into the groundwater. The applicant has proposed to monitor the quality of the coal annually. In addition, the applicant has proposed to monitor the water quality in the existing well annually each fall (section 5.3.2, PAP). The water samples will be analyzed according to the parameter list given in section 23 of section 1.16 of the PAP.

Results will be submitted to the Division each year with the required annual report. If the coal quality analysis indicates a potential for water quality degradation, the applicant will initiate a more intensive ground water monitoring program (section 5.3.2, PAP). This program will consist of drilling two wells and annually monitoring these wells during high and low water table level conditions. The samples will be analyzed for the constituents contained in the complete baseline parameter list presented in section 24 of section 1.16.

Compliance

The applicant has presented an acceptable alternative to monitoring the groundwater in the area via the monitoring of potential impact sources (i.e. coal quality). However, due to insufficient baseline information at the site, the Division feels the variability in coal quality should be quantified during the first year of the permit term. Therefore, a set of coal quality leachate data should be submitted during the first year following permit approval. Stipulation UMC 817.52-RPS is necessary for approval.

Stipulation UMC 817.52-RPS

Within 30 days of permit approval, the applicant shall submit to the Division a revision for section 5.3.2. The revision should commit to submission of quarterly coal quality samples for a period of one year.

UMC 817.53 Hydrologic Balance: Transfer Of Wells-RPS

Existing Environment and Applicant's Proposal

A single water well exists at the site (identified as the water sump on Exhibit 2.1-1). The proposal includes a commitment to plug the well during reclamation of the site (section 3.4, PAP). However, the proposal does not contain specific details of the well closure.

Compliance

The applicant is generally in compliance with this regulation. However, specific details of the well closure should be submitted. These should include a commitment to have the well closed by a licensed well driller and conform to the requirements of the State Engineer's "Administrative Rules for Water Well Drillers, 1985".

Stipulation UMC 817.53-RPS

Within 30 days of permit approval, the applicant must submit specifications for the plugging of the water well. These specifications must conform the requirements outlined in the document entitled "Administrative Rules for Water Well Drillers, State of Utah, 1985".

WPOB62/15-25

June 19,1988

TO: File

FROM: David Darby, Geologist

RE. Technical Analysis (TA), Banning Siding, Soldier Creek Coal Company, ACT/007/043, Folder No. 2, Carbon County, Utah

Summary

Soldier Creek Coal Company's (SCCC) submitted information in their Mining and Reclamation Plan (MRP) on July 13, 1988 pertaining to the geology, ground water hydrology and subsidence for the Banning Siding loadout. This information has been reviewed for technical adequacy.

The following comments indicate the status of completeness for each of the following regulations.

UMC 817.52 Hydrologic Balance

GROUND WATER

The geologic characteristics in the vicinity of the mine area are described in Chapter 5, sections 5.1.2 and 5.4.2.

Ground water monitoring is discussed in Chapter 5, section 5.3.2.

Applicants Proposal

The Banning Siding loadout is located on the eroded surface of the Mancos Shale. The shaley units of the Mancos Shale have a very low permeability and serve as confining beds for the underlying formations rather than aquifers. Drillhole data from petroleum exploration in the region suggest that the Mancos Shale, where saturated, contains water that is moderately to very saline (Waddell, et al., 1981). Development of the uppermost saturated zone beneath the site has not occurred. This will further limit impacts to the ground water.

The primary potential for effecting ground water will come from the leaching of constituents from the coal. To determin the potential of this happening, the applicant will collect a coal sample from the mine on an annual basis and have it analysed to determin if acid or toxic material will be generated.

If test results indicate that coal stored on site is contaminated, the applicant will install two monitoring wells and monitor them as outlined on page 5-15, Volume 1 of the Mining and Reclamation Plan.

Compliance

The information presented in the Mining and Reclamation Plan by Soldier Creek Coal Co. concludes the potential negative impacts this loadout will have on the ground water system. The Regulatory Authority concurs that transmissivities within the shale members are very low. The permeability of the shales should retard vertical flow from overland flow and leachates from reaching any saturated zones. The proposed monitoring plan is acceptable to the Regulatory Authority.

Stipulation-UMC 817.52-DD

None

UMC 817.121-126 Subsidence Control Plan

Applicant's Proposal

Since this operation is a loadout, there will be no underground disturbance at the site.

Compliance

This section is not applicable.

Stipulations

None.

cc: S. Linner
R. Summers
1565R