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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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September 25, 1991

TO: Daron Haddock, Permit Supervisor

FROM: Sharon Falvey, Reclamation Hydrologist ^{SF}

RE: Cessation Order C91-18-1-1, AMAX Coal Company, Castle Gate Mine, Carbon County, Utah, Permit # ACT/007/004, Folder #5.

SUMMARY

On December 24, 1990 the Division reviewed and reissued the Castle Gate Mine permit. The permit issuance itemized additional requirements as a Division Order including Division Order #24 which required additional drainage controls at the School House Canyon refuse site. The operator responded to the Division Order on March 1, 1991, after review, the Division determined that the operator failed to meet the requirements identified. On June 24, 1991 the Division received a Ten Day Letter issued by the Office of Surface Mining, regarding refuse pile drainage. Following the Ten Day Letter, Notice of Violation (NOV) N91-18-1-1 was issued by the Division. Our records show that the violation, issued on June 28, 1991, was received certified mail by S. Humn at Amax Coal Companies Evansville Office on July 1, 1991.

Pars of NOV N91-18-1-1 are as follows: part 1, required the applicant to obtain approval (by the Division) for diversion designs which will satisfy the requirements of R614-301-742.300 and R614-301-746.212; part 2, required complete construction of diversion channels as approved in part 1. Part 1 and part 2 were to be completed within 30 days and 60 days of receipt, respectively.

On August 14, 1991 Cessation Order C91-18-1-1 was issued for failure to meet part 1 of the violation. On September 3, 1991 the Division received a request for extension to complete part 2 of the violation. The violation was modified to allow part 2 to be completed by September 30, 1991.

On August 15, 1991 the Division received an amendment from the applicant to meet the conditions of the Cessation Order. The Division again determined the operator to be out of compliance with the stated regulations.

This review analyzes the information submitted to the Division on October 11, 1991. The applicant has increased design information necessary to obtain compliance with the regulations, but still falls short of some necessary design features.

ANALYSIS

R614-301-742.300
R614-301-746.212

Operator's Proposal:

The operator has provided watershed drainages for the proposed interim drainage control and final drainage control. The final drainage control is created to handle maximum design capacity of the refuse pile. All the design ditches lead to sedimentation pond 013.

All drainage ditches are designed for the 100 year - 6 hour rainfall event as required for refuse piles. The operator proposes designs for interim ditches 6, 7A, 7B, and 7C, and final drainages 6A, 6B, 7A, 7B, 7C.

The proposed designs include a 50% slope on final and interim ditches 7B, and 7C and final drainage ditch 6B. Designs also include a 25% slope on interim drainage ditch 6. These steep slope channels are designed with supercritical flow. In channels with 50% slopes velocities vary between 7.05 to 15.34 feet per second (fps). Ditch 7C drains approximately 19.6 acres with a design peak discharge of 15.6 cubic feet per second (cfs) over the face of the fill. The operator has indicated use of a filter fabric if determined necessary.

Analysis:

Presently the operator has submitted designs for the operational portion with all ditches leading to the sediment pond. The operator has not yet provided ditch designs for reclamation. Because the sedimentation pond is not presently an approved permanent structure, the applicant still must provide final reclamation plans. The reclamation plans will be considered disassociated with this NOV/CO because related information required for refuse pile reclamation will be obtained under NOV N91-28-2-1.

The applicant has provided ditch designs to address the regulations requirements yet, in the design of the ditches the operator fails to specify the ditch depth. Because depth and velocity change with a change in slope, slope must be

accounted for in the design. Unless the operator intends to maintain a constant grade throughout the channel the minimum slope, and maximum slope should be used to determine the maximum depth and maximum velocity respectively. If the operator intends to maintain a constant slope this criteria will be field verified. Additional information might be necessary for notable slope change between connecting ditches.

All steep ditch designs show the Froude Number is well over 2. This indicates the flow in the channels have the potential to form waves and therefore will not be reflective of the proposed design depth. In addition, surges and hydraulic jumps may be created when channel design features, such as slope, change. The applicant has not provided freeboard designs to accommodate any of these variations.

The applicant says riprap/filter fabric will be provided where necessary but, does not indicate where it is necessary. Most available riprap design methods are based on low slope percentage (<10%). The applicant has not used design criteria for steep slopes in this submittal. In addition, the steep slope designs submitted are capable of producing turbulent flow, thus increasing the need for site specific filter and gravel design.

RECOMMENDATIONS

The operator will submit text, insertable into the MRP, containing brief information on the method of drainage placement as the advance placement of fill material requires. The applicant will indicate, in text insertable into the MRP, that notification to the Division will be made prior to relocation of the drainages. The "Final Drainage Control" map leads one to believe that the structures are permanent. Therefore, to be sure that the applicant has provided a clear and accurate document the applicant will label the exhibit so that it can not be misinterpreted or, the applicant will include such a statement in text insertable into the MRP. The applicant should include other applicable ditch design descriptions in text insertable into the MRP.

The operator must provide ditch depth as well as freeboard to ensure stability of ditch designs. Because the operator has proposed steeply designed, high kinetic energy channels, they must provide site specific designs for riprap, gravel and filter fabric to assure stability of the designed channels.