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Please file in Trail Mtn
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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Manti-LaSal National Forest
350 East Main Street
Price, Utah 84501

2800

December 15, 1978

RECEIVED DEC 18 1978 OIL, GAS, & MINING

K. Michael Thompson
Engineering Geologist
State of Utah - Dept. of Natural Resources
Division of Oil, Gas, and Mining
1588 West North Temple
Salt Lake City, Utah 84116

Dear Mr. Thompson:

Thank you for your December 7, 1978, letter concerning the runoff calculations for the Trail Mountain Coal Mine.

Our hydrologists had considered Kirpitch's equation for time of concentration, but because the formula was developed for agricultural applications and since it was our collective opinion that neither Kirpitch's or any of the several other equations we tried gave satisfactory results, we selected 2.0 ft./sec. as our best estimation of the average velocity of runoff water. Time of concentration (T_c) was then calculated using an estimated watershed length of 7,200 feet.

This method of calculation of T_c is described by the Soil Conservation Service (N.E.H.-4, pages 15-6, 15-8). They recommend that on an average terraced channel, such as is present on the main water course of the Trail Mountain watershed, an average velocity of 1.5 ft./sec. can be assumed.

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Burchard Heede, in his paper "Mountain Watersheds and Dynamic Equilibrium" 1975, describes stream velocities in the more applicable setting of an actual mountain stream. He reports that as the result of channel debris and channel steps, the average velocity should be approximately 1.75 ft./sec. (This was on an average 26 percent channel slope; the slope in our calculations is 21 percent.) For a safety margin, we increased this estimate to 2.0 ft./sec.

With any of these methods, a fair amount of uncertainty naturally exists. But we feel that our calculation of T_c of 1 hour is appropriate for this watershed. On-site examination of the channel suggests that our calculations of 32.3 cfs for the peak flow may still be high.

Please contact us if you still disagree with our calculations. We are willing to consider further suggestions and discussions as to better methods.

Sincerely,

W. H. Boley

WILLIAM H. BOLEY
Forest Engineer