



COLORADO


**Division of Reclamation,
Mining and Safety**

Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

MEMORANDUM

To: Jared Ebert

From: Tim Cazier, P.E. 

Date: December 14, 2017

**Re: M & G Pit – Permit No. M-1986-079;
Slope Stability, Preliminary Adequacy Review**

The Division of Reclamation, Mining and Safety engineering staff (Division) have reviewed the M & G Pit engineering analysis submitted in lieu of structures agreements required for SO-03 and dated December 4, 2017.

1. Slope stability analyses most basic requirement is that equilibrium must be satisfied in terms of total stresses. All body forces (weights) and all external loads, including those due to water pressures acting on external boundaries must be included in the analyses. Simply comparing internal friction angles with possible slope angles does not accomplish this.
2. Internal friction angles for “unconsolidated dirt” are stated without any reference to laboratory testing or accepted published values. Given the generic use of the term “dirt”, there is no way to verify values used.

A global stability analysis that factors in material strength properties (with references), water table levels and saturated toes of slopes are required to meet Rule 6.5(3).

If either you or the applicants have any questions regarding the comments above, please call me at (303) 866-3567, extension 8169.

