



3/6/2024

To: Colorado Division of Reclamation, Mining, and Safety

From: Deb Hummel, River Program Director, The Watershed Center

RE: Recommendations for Approved Colorado Milling Company's Gold Hill Mill (M-1994-117) Conversion Application

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The purpose of this memo is to provide additional comments regarding Approved Colorado Milling Company's Gold Hill Mill (M-1994-117) Conversion Application. The Watershed Center submitted public comments regarding the Colorado Milling Company's Hard Rock 110d Hard Rock Conversion Application dated 2/27/2023. Since then, we have received and reviewed the following:

1. Colorado Milling Company's (c/o Lewicki and Associates) response to conversion application concerns and comments, dated May 1, 2023
2. Colorado Division of Reclamation, Mining, and Safety's (DRMS) Decision to Approve a Hard Rock 110d Conversion Application with Objections, Colorado Milling Company, LLC., Gold Hill Mill, File No. M-1994-117, dated February 7, 2024

After reviewing the response and decision letter listed above, The Watershed Center recommends that DRMS reconsider the potential risks of groundwater contamination to Town of Gold Hill's (Town) 90 residential and commercial groundwater wells by integrating field-based monitoring during development of Colorado Milling Company's Environmental Protection Plan for Gold Hill Mill (Mill). Our recommendation is based on lack of field based evidence to support that the Hoosier Reef is impermeable and a barrier to groundwater connection.

Both the Colorado Milling Company (c/o Lewicki and Associates) and DRMS Decision letter stated that the groundwater that feeds wells in the Town are isolated from groundwater that may be contaminated near the Mill because of a geological feature, the Hoosier Reef fault. Upon further review of public records, 1985 appears to be the first time an engineering consultant claimed that the Hoosier Reef is an impermeable barrier protecting the Town from groundwater contamination based on undocumented claims about the amount of water in mine workings on east and west side of the fault. The Town documented their concerns about this claim and lack of associated, field-based evidence (Attachment 1). We did not find any documentation of field-based evaluation to support the claim that the Hoosier Reef is impermeable and therefore a barrier to groundwater flow.

Without supporting field-based evidence, we question the assertion that the Hoosier Reef creates a barrier to groundwater connection. In general, breccia associated with ore deposits has been described as having "good porosity and permeability " and in some cases, associated with release of metals, acid mine drainage, and radon (Shukla and Sharma, 2018<sup>1</sup>). The breccia in the Hoosier Reef fault has been described as "silicified," which might reduce its permeability, but there is no reason to expect that it is not fractured like the surrounding Boulder granodiorite, which is adequately fractured to provide water for the 90 residential and commercial wells in the Town.

<sup>1</sup> Shukla M.K and Sharma A. (2018) A brief review on breccia: It's contrasting origin and diagnostic signatures. *Solid Earth Sciences* **3**, 50-59.

As such, The Watershed Center recommends that DRMS reconsider the risks to the Town's wells by the following field-based monitoring incorporated into the Environmental Protection Plan of the Gold Hill Mill:

1. Collect baseline water quality data for metals in Town of Gold Hill wells prior to any facility upgrades or milling operations and incremental monitoring throughout facility upgrades and milling operations.
2. Create and utilize an additional groundwater monitoring well between the Mill and Town within the same radius of the other groundwater monitoring wells and collect incremental data prior to any facility upgrades or milling operations and during milling operations.
3. Consider pump tests or tracer tests to test the ability of the Hoosier Reef fault to prevent groundwater flow and contaminant transport.

Sincerely,

A handwritten signature in black ink, appearing to read "Deb Hummel". The signature is fluid and cursive, with the first name "Deb" and last name "Hummel" clearly distinguishable.

Deb Hummel  
River Program Director  
The Watershed Center  
[dhummel@watershed.center](mailto:dhummel@watershed.center)  
720-818-4573

**Attachment 1.**

**Gold Hill Mill 1985-09-23 Gold Hill Town Hall Meeting Review  
REV25950**

# Committee on Mining & the Environment

Gold Hill Town Meeting, Inc.  
Gold Hill, Colorado



R. N. Mason  
Chairperson

674 - 195-

23 September 1985

P.O. Box 1698  
Boulder, CO 80306

Department of Natural Resources  
Mined Land Reclamation Division  
423 Centennial Bldg, 1313 Sherman St.  
Denver, Colorado 80203

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**RECEIVED**

SEP 25 1985

Gentlemen of the Board:

**MINED LAND  
RECLAMATION DIVISION**

Reference is made to the application of Gold Hill Ventures Limited Partnership for an amendment to the mining and reclamation permit for the Cash Mine, and to our letter to you dated 9 September 1985 regarding that amendment.

Since writing that letter, a series of meetings with local residents, representatives of Gold Hill Ventures, and MLRB staff has enabled us to refine and develop our position somewhat. We are therefore submitting the following comments in support of the hearing now scheduled for the 26th of this month.

## COMMENTS ON WATER QUALITY ISSUES

### Comment 1: Permeability of Hoosier Reef

In discussions with representatives of Gold Hill Ventures Ltd, as well as in their presentation to a meeting of area residents held last Thursday (September 19th), great stress was laid on the impermeability of Hoosier Reef "to great depth," as a protection to domestic water supplies in the Gold Hill area. Since Reef permeability is obviously of crucial importance to both water contamination and flow gradient concerns, we feel that substantial objective evidence of the Reef's effectiveness as a water barrier is required. To this end, we suggest that a review of actual drilling experience should supplement qualified professional opinion. We suggest that experienced operators, such as Norris Drilling, be contacted regarding local well drilling results. We are willing to support this effort, if required.

### Comment 2: Lining of Tailings Pond

The Committee strongly agrees with the MLRB staff position that the tailings pond should be lined. We understand that Gold Hill Ventures will be proposing a Hypalon liner; this is acceptable.

### Comment 3: Use of Monitoring Wells

Emplacement of monitoring wells near the foot of the tailings impoundment is required and is, we understand, being proposed. Additionally, one or more wells should be emplaced to monitor the seepage from the Hazel A adit, thus assuring timely response in the event that leakage should prove excessive.

Comment 4: Stockpiling of Ore

The Committee expressed concern (Ref. our 9 Sept. letter, objection 3a) that stockpiling of ore could lead to weathering, acidification, and possible heavy metals release. Discussion with Gold Hill Ventures representatives leads us to believe that the intent is to stockpile only relatively small quantities of ore, up to a few hundred tons, maximum, with only short above-ground residence times prior to milling. This is acceptable, provided that tonnage is held to 600 or less (a 12 working-day supply), and that the operator agrees to consume remaining above-ground ore stockpile prior to any extended (more than 6 months) shutdown of mill operations.

*Comment*

COMMENTS ON SAFETY ISSUES

Comment 5: Water Pipeline Safety

Our present understanding is that the water line from Left Hand Creek to the Time portal is being engineered by an independent consultant. We therefore assume that appropriate features, such as check-valving, antisiphoning, etc. are being included. This design should be reviewed as soon as available.

Comment 6: Hazel A Adit Bulkhead

Conversation with Gold Hill Ventures personnel developed the information that the retaining bulkhead at the Hazel A portal is constructed of heavy timbers and planks faced on the pressure side with a plastic film material, with a small headspace between the top of the bulkhead and the top of the adit. This appears to be adequate for simple storage of water. However, the present proposal does not address the contingency of a 6" 24 hour precip. event which, over a 1 acre exposed pond area, would provide enough water to overflow the bulkhead, even if the adit were initially dry. Some means of positive control of downflow of decant water is required which will operate even in the absence of human supervision. Alternatively, the bulkhead must provide a full seal of the adit, and have the capability to withstand the worst-case pressure head (probably 50 to 60 psi) with adequate safety factor.

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GENERAL COMMENTS

Comment 7: Reclamation Financing

Citizen concerns have been voiced regarding the inadequacy of the legally required reclamation bond of \$5,000. The operator's own estimate is that his original proposal would involve costs 10 times that amount. The Committee concurs. Therefore, we have agreed with Gold Hill Ventures Ltd that an escrow account will be established as mutually agreed among Gold Hill Ventures, the MLRB and the Committee. Amount will be not less than \$50,000, to be accumulated over not more than 5 years at a rate not less than \$10,000 per year. Disbursements from this account are to be for purposes of compliance with MLRB reclamation requirements. An agreement documenting this will be drawn up by Gold Hill Ventures and submitted for mutual approval.

Comment 8: Proposal Documentation

Documentation in support of the proposed amendment is substantial; however, maps of the affected BLM unpatented claims and the route of the proposed water line have not yet been made available. In the interest of completeness and to facilitate final evaluation, these should be furnished.

Comment 9: Concluding Note

The applicant's proposal has been reviewed by Mr. Jack Laughlin, Registered Professional Engineer in Colorado and California, and by Dr. William Page, geologist, both of whom are property owners on the ridge separating Gold Hill from the proposed Mine/Mill. Both of these gentlemen concur with the MLRB staff recommendation to line the tailings pond. They also recommend that underground storage of pond water in the Hazel A adit be allowed only after careful evaluation of seepage rates, and only if appropriately sited monitor wells are installed to permit a continuing assessment of storage performance. Their overall evaluation is that the proposal is well executed, and they are generally supportive of mining in the Gold Hill area.

Since our letter of 9 September, the Committee has held two meetings, encompassing a total of approximately six hours, with representatives of Gold Hill Ventures. During the first, public, meeting, the applicant was given an opportunity to present his proposal to members of the Gold Hill, Summerville, Fourmile Canyon and Left Hand Canyon communities. The applicant's discussion seemed clear, forthright, and substantive, and was generally well received. The community's general attitude remains guarded, however, with significant outright opposition to milling. A second, private, meeting was held Monday evening (23 September) and consisted of a discussion of a number of more technical issues. With the exceptions noted above, the Committee's technical concerns have been satisfied, and we believe that it may be possible to resolve them without the necessity of a formal public MLRB hearing.

Respectfully Submitted  
September 24, 1985  
For the Committee

  
Robert N. Mason, Chairman