m/027/007

JUMBO MINING CO.

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DOGM
MINERALS PROGRAM
FILE COPY

March 20, 1990
File: UDH3200

Mr. Jay B. Pitkin, P.E.
Manager, Eng. & Water Quality Branch
Bureau of Pollution Control
Department of Health
Division of Environmental Health
P.O. Box 16690
Salt Lake City, Utah 84116-0690

RECEIVED
MAR 22 1990
DIVISION OF
OIL, GAS & MINING

Dear Mr. Pitkin:

Re: DRUM MINE PROJECT
Your letter March 15, 1990

For your ready reference, I am enclosing a copy of the neutralization criteria contained in my letter dated February 2, 1989. After the "free vs. total cyanide" question was answered by telephone (see March 16, 1989 letter attached), this procedure was subsequently approved by letter dated March 30, 1989, a copy of which is also attached.

In my letter to you dated January 9, 1990, I stated:

"We would further comment that the new pH requirements of 6.5 to 7.5 are not compatible with the higher pH's shown to exist locally in the three know sources of ground water in the area. None of these show pH values below 7.0 and a better fitting range of values would be 7.5 to 8.5. This was recognized in the acceptance of our Neutralization scheme by your March 30, 1989 letter."

To substantiate this point, I am enclosing copies of excerpts from two technical papers entitled "UTILIZATION OF SOILS TO MITIGATE CYANIDE RELEASES", p.157; and "NATURAL MECHANISMS IN SOIL TO MITIGATE CYANIDE RELEASES", pp.469 and 470. Also find enclosed copies of ground water analyses from the only two springs in the Drum Mountains. Copies of the full references have previously been supplied to your agency, and should be in our files.

From these references, you will quickly see that the pH in the two springs are 7.8 and 7.7. Thus, it is clear that <u>the background water quality is above the upper limit which your guidelines specify</u>. Further, it must be noted that both of these are springs are surrounded by intrusive rocks, which are more neutral than the sedimentary limestones, shales, etc. which predominate in the leached ore heaps. Thus we can expect that the pH of any ground water which might reside in these calcareous formations would be significantly higher that these values.

Even more representative of the "natural, equilibrium pH" which might be expected from calcareous rocks which are contained in the ores on the leach pads, is the list of pH values, all above 8.0, which result from stirring deionized water with these rocks in a reactor (see p.157 of the first quoted reference). Those rocks which gave values under 8.0 are shown elsewhere in the reference to contain significant acidic materials, not present in the Drum ores.

Also relevant to this discussion is the fact that at a pH of 8.0, over 95% of the cyanide would be the volatile species, HCN, and thus would migrate readily from the ground water to be consumed by soil bacteria, etc.

The importance of recognizing the above factors is that a regulation which would force a steady state neutralization pH in the 6.5-7.5 range, predictably will:

a) Not lead to a result consonant with the background water standards.

b) Not materially further reduce a contaminant--especially when it is realized that the neutralization plan calls for no waste water discharge, the solutions being evaporated in the final spraying process.

c) Predictably lead to the consumption of many tons of acids, which must dissolve a substantial amount of calcium and other basic constituents from the ores on the heaps, before the required steady state pH can be attained.

<u>In consideration of the above, we again request that you provide a variance from your guidelines to raise the upper limit of the neutralization pH range from 7.5 to 8.5.</u>

In addition, please provide us with the official analytical procedures to be used to determine WAD (weak acid dissociable cyanide) as well as Total Cyanide.

Your assistance is greatly appreciated on this matter.

Sincerely yours,

E. B. King
President

cc: Roger Foisey, Central Utah District Health Dept., Richfield.
BLM, House RAnge Resource Area, Fillmore
Wayne Hedberg, Oil, Gas & Mining
D. Hartshorn, Drum Mine

Ref (1)

d) Should leakage be detected in this system, steps will be taken promptly to remove the respective heap from service.

4) NEUTRALIZATION CRITERIA FOR HEAP LEACH PADS AND PONDS:

a) As a first step in the decommissioning of the heaps, the makeup additions of reagents (except for descalant) will be stopped. Circulation through the sprinkling system will be continued until the pH and cyanide concentrations drop to below 8.5 and 0.2mg/l (free CN), respectively.

b) In this process, most of the process solution will be evaporated and make up water additions will be restricted so that at end of the sprinkling/leaching operation, the inventory of solution remaining in the ponds will be minimal.

c) The remaining pond solutions, together with the sand, mud, and carbon will be recovered for the gold content known to exist in the carbon fines at the bottom of the ponds, dried, and shipped to a smelter, or other processing facility. No process solutions will be discharged into the area drainage.

d) Finally, the liner will be perforated and buried in the bottom of the pond. The walls and berms of the pond will be seeded and stabilized, as a part of the overall land reclamation process.

Please let me know if we can supply any additional information pursuant to these requests.

Sincerely,

E. B. King

cc: Roger Foisey, Central Utah District Health Dept., Richfield.
Bruce Hall, Central Utah District Health Dept., Nephi.