

KERR-MCGEE CORPORATION
KERR-MCGEE CENTER - OKLAHOMA CITY, OKLAHOMA 73125

February 3, 1977

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Alphonso A. Topp, Jr.
Environmental Scientist III
NMEIA Radiation Protection Section
P. O. Box 2348 - Crown Building
Santa Fe, New Mexico 87503

Dear Mr. Topp:

Kerr-McGee requests the Ambrosia Lake Mill license SUA 616 pending renewal be amended to allow the Company to remove tailings sand from the restricted area and transport it to various underground mines for the express purpose of backfilling mined out areas (also referred to in industry jargon as sand filling or stowing) underground.

Kerr-McGee consultants have agreed with the Company's conclusion that tailings provide the best fill material available because of its water draining qualities. The fill material is slurried with mine water to facilitate its being pumped into the mine from surface, laterally through the mine to the fill area, and then into the stope void. Such a slurry can be placed so that no void or little void space remains. This is critical to the success of the procedure. The tailings allows the rapid and easy drainage of the water through specially constructed bulkheads (also called brattices).

Failure to obtain complete drainage of the water leaves a hydraulic head behind these bulkheads which may cause their ultimate failure. The liquified fill material would then partially evacuate the filled stope leaving a void. The roof of the void could then cave; precisely the result the fill was placed there to prevent. Other earth materials have not exhibited this all-important draining quality necessary for a successful operation.

The advantages to filling at Ambrosia Lake are numerous. These are listed below without regard as to which may have a more important priority.

- (1) Filling the stoped areas will prevent caving of such significance as to cause subsidence of the surface topographic expression. More importantly, the prevention of caving will avert extensive upward fracturing of the local formations which would lead to cross-communication of aquifers. In the case of Ambrosia Lake, the mining horizons are in the Westwater Canyon member of the Morrison formation - itself an aquifer. Overlying the Westwater is the Brushy basin member of the Morrison which is an aquiclude. Overlying the Brushy basin is

the Dakota formation which is an aquifer of good quality water. Caving would cause fracturing which would drain the Dakota into the mining areas. This is obviously an undesirable effect. Secondly, the addition of Dakota water would increase the mine water control problem and result in more water being discharged to surface.

- (2) Filling of stoped areas and other abandoned areas enhances ventilation control throughout the mine. Any operation that facilitates better ventilation is desirable as this aids in the reduction of radiation health physics concerns for the employees underground.
- (3) Sandfill in stabilizing mined out areas, allows close proximity mining of remaining ores. This means a higher final extraction percentage of the total reserves thereby resulting in a more efficient use of a limited natural resource.
- (4) In allowing the mining of adjacent ores the fill material, by preventing caving, increases the safety factor for the miners. A caved area places stress on adjacent pillars which results in more difficult roof control procedures.
- (5) Placement of tailings underground will demand in excess of 1000 tons per day, five days per week as currently planned for the future. As the mill is expected to continue its current rate of 6000 TPD, this would mean one-sixth of the tailings will be stowed underground. The rate of use will alleviate by that much tonnage the future problem of long-term stabilization and control of the surface tailings pile.

The disadvantage of using tailings as fill material is the potential for future groundwater contamination. It is reasonably certain that, once mining ceases, the Westwater aquifer will recover at least to the extent that the mined areas will be inundated. The fill material will have a higher permeability than the host rock. However, analysis of the fill material shows it to be very low order radioactive material. A recent analysis of Ra²²⁶ in this material ran 60×10^{-12} Ci/gm. The source material has been depleted by the milling process. The net amount of radioactivity in the sandfill will be less than the amount left in the immediate host rock because current mining practices call for a mining cut off grade of 0.10%. Thus the potential for the fill material to degrade any groundwater found in the host rock is considered small.

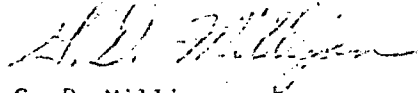
On balance, the many advantages clearly outweigh the one speculative disadvantage. The disadvantage cited is by no means certain to occur. The advantages cited are known to produce the results claimed.

We would like to examine another aspect that being, the return of some fill material to other companies for whom Kerr-McGee tolls ore. Although no commitments have been made, we have been approached by others to do this. As all the mines in the district are in the Westwater member,

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the same criteria, pro and con, given above would hold for any mine as for Kerr-McGee's mines. We, therefore, request an amendment to permit return of tailings to our toll Companies provided a successful agreement can be concluded between Kerr-McGee and other parties.

Very truly,



G. D. Milligan
Environmental Specialist-
Administrative

GDM:cd