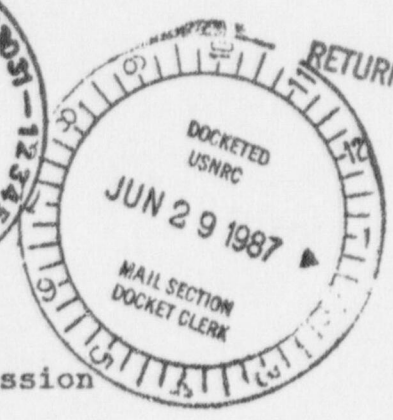
40-8681



RETURN ORIGINAL TO PDR, HQ.

June 24, 1987

Mr. Harry J. Pettengill
U. S. Nuclear Regulatory Commission
Region IV
Uranium Recovery Field Office
Box 25325
Denver, CO 80225

Re: Umetco Minerals Corporation
SUA-1358: Docket No. 40-8681
White Mesa Mill, Utah

Dear Mr. Pettengill:

The purpose of this letter is to answer questions raised by you and your staff concerning Umetco's proposal to fill Cell 2 at the meeting held in your offices May 7, 1987. It is felt that this letter adequately covers the issues raised and, if no further word is received within thirty days, Umetco will proceed with the filling of Cell 2. The reason a time limit is necessary is that the present ore schedule calls for mill shut down before the end of this year and Umetco desires to have the Cell as full as possible at the end of this operating period.

The main concern expressed at the meeting dealt with the ability of Cells 2 and 3 to hold design storm runoff without overtopping the dike structures. The original design, contained in Engineers Report: Tailings Management System, June 1979, D'Appolonia Consulting Engineers, Inc., called for the ability of the system to hold the probable maximum flood series (PMFS). This was defined on page 3-7 as the "flood equivalent to approximately 40 percent of the probable maximum flood (PMF) followed in three to five days by the PMF, all of which may be preceded or followed by the 100-year storm." The rainfall value assigned to this sequence of events was 15 (14.76) inches. Since then the design storm sequence has changed, as well as the data base from which the calculations are made.

In addition to the excess safety factors built in by designing to the PMFS, each cell was also over designed as can be seen by referring to Appendix A, Sheet 15 of the above mentioned report. See the Table below for a summary of that information.

WM-754

Table 1
D'Appolonia Elevations, feet

Cell	Dike Crest	Emergency Spillway	Maximum Design Flood Pool	Maximum Operating Pool
1-I	5620.0	5618.5	5617.0	5615.0
2	5615.0	5613.5	5611.7	5610.0
3	5610.0	NA	5606.4	5605.0

Note the difference in elevations between the Design Flood Pool and the Emergency Spillway. This is the over design "cushion" and is calculated as the difference of the Emergency Spillway and the Maximum Design Flood Pool elevations, divided by the difference of the Maximum Design Flood Pool and the Maximum operating Pool elevations. For Cells 1-I, 2, and 3 these values are 75%, 106%, and 257% respectively. See Table 2.

Table 2

Cell	Volume, Yds^3 Spillway to Flood Pool	Volume, Yds^3 Flood Pool to Operating Pool	Percent Excess Capacity
1-I	1,279,265	959,449	75%
2	1,292,541	1,368,573	106%
3	1,165,821	2,997,826	257%

To repeat, these figures were based on 15 inches of rain for the PMFS. Calculation of the PMF yields a figure of 9.2 inches of rain using the N.O.A.A. Hydrometeorlogical Report No. 49, 39% less than the original D'Appolonia figures. See the attached calculation pages. Since Cell 3 already has an excess capacity of 2,997,826 cubic yards over and above that required for flood control, all of the design flood volume for Cell 2 can be held in Cell 3 without approaching the top of the dike. Note that Cell 3 at present does not have an emergency spillway. A spillway would be installed when Cell 4 is constructed.

Table 6.3A.--Local-storm PMP computation, Colorado River, Great Basin and California drainages. For drainage average depth PMP. Go to table 6.3B if areal variation is required.

Drainage White Mesa Mill, local Area 10 mi^2 (km^2)
Latitude 37°39' Longitude 109°30' Minimum Elevation 5600 ft (m)

Steps correspond to those in sec. 6.3A.

1. Average 1-hr 1-mi^2 (2.6-km^2) PMP for drainage [fig. 4.5]. 8.5 in. (mm)

2. a. Reduction for elevation. [No adjustment for elevations up to 5,000 feet (1,524 m): 5% decrease per 1,000 feet (305 m) above 5,000 feet (1,524 m)]. 97 %

   b. Multiply step 1 by step 2a. 8.2 in. (mm)

3. Average 6/1-hr ratio for drainage [fig. 4.7]. 1.21

	Duration (hr)								
	1/4	1/2	3/4	1	2	3	4	5	6
4. Durational variation for 6/1-hr ratio of step 3 [table 4.4].	74	89	95	100	110	115	118	119	120 %
5. 1-mi^2 (2.6-km^2) PMP for indicated durations [step 2b X step 4].	6.1	7.3	7.8	8.2	9.0	9.4	9.7	9.8	9.8 in. (mm)
6. Areal reduction [fig. 4.9].	73	78	81	82	85	87	88	89	90 %
7. Areal reduced PMP [steps 5 X 6].	4.5	5.7	6.3	6.7	7.7	8.2	8.5	8.7	8.8 in. (mm)
8. Incremental PMP [successive subtraction in step 7].				6.7	1.0	0.5	0.3	0.2	0.1 in. (mm)
	4.5	1.2	0.6	0.4	} 15-min. increments				

9. Time sequence of incremental PMP according to:

   Hourly increments [table 4.7]. 0.2 0.5 6.7 1.0 0.3 0.1 in. (mm)

   Four largest 15-min. increments [table 4.8]. 4.5 1.2 0.6 0.4 in. (mm)

Table 6.1.--General-storm PMP computations for the Colorado River and Great basin

Drainage Local Area 10 mi^2 (km^2)

Latitude 37°39', Longitude 109°30' of basin center

Month October

Step	Duration (hrs) 6	12	18	24	48	72
A. Convergence PMP						
1. Drainage average value from one of figures 2.5 to 2.16	12.0 in. (mm)					
2. Reduction for barrier-elevation [fig. 2.18]	50 %					
3. Barrier-elevation reduced PMP [step 1 X step 2]	6.0 in. (mm)					
4. Durational variation [figs. 2.25 to 2.27 and table 2.7].	71 %	87 %	94 %	100 %	114 %	120 %
5. Convergence PMP for indicated durations [steps 3 X 4]	4.3 in. (mm)	5.2	5.6	6.0	6.8	7.2
6. Incremental 10 mi^2 (26 km^2) PMP [successive subtraction in step 5]	4.3 in. (mm)	0.8	0.4	0.4	0.8	0.4
7. Areal reduction [select from figs. 2.28 and 2.29]	100 %	100	100	100	100	100
8. Areally reduced PMP [step 6 X step 7]	4.3 in. (mm)	0.8	0.4	0.4	0.8	0.4
9. Drainage average PMP [accumulated values of step 8]	4.3 in. (mm)	5.1	5.5	5.9	6.7	7.1
B. Orographic PMP						
1. Drainage average orographic index from figure 3.11a to d.	Revised 3.4 in. (mm)					
2. Areal reduction [figure 3.20]	60 %					
3. Adjustment for month [one of figs. 3.12 to 3.17]	98%					
4. Areally and seasonally adjusted PMP [steps 1 X 2 X 3]	3.3 in. (mm)					
5. Durational variation [table 3.6] 3.9 37°	32 %	59	81	100	152	197%
6. Orographic PMP for given durations [steps 4 X 5]	1.1 in. (mm)	1.9	2.7	3.3	5.0	5.8
C. Total PMP						
1. Add steps A9 and B6	5.4 in. (mm)	7.0	8.2	9.2	11.7	12.9

2. PMP for other durations from smooth curve fitted to plot of computed data.

3. Comparison with local-storm PMP (see sec. 6.3).