UNITED STATES

NUCLEAR REGULATORY COMMISSION

REGION IV

URANIUM RECOVERY FIELD OFFICE
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DENVER, COLORADO 80225

OCT 13 1989

URFO:ROG
Docket No. 40-8084
SUA-1119, Amendment No. 24
04008084160R

MEMORANDUM FOR: Docket File No. 40-8084

FROM: Raymond O. Gonzales
Project Manager

SUBJECT: AMENDMENT NO. 24 TO SOURCE MATERIAL LICENSE SUA-1119 FOR THE RIO ALGOM MINING CORP., LISBON MILL

Introduction

By letters dated April 29, 1989, May 19, 1989, and September 28, 1989, Rio Algom Mining Corp. (RAMC) submitted information in support of a request to amend License Condition Nos. 45 and 54. They requested that the required freeboard in the Lower Pond in License Condition No. 45(B) be reduced to 8.5 feet during the summer months and 5 feet during the winter months. It was also requested that the required 100-foot beach in License Condition No. 45(D) be reduced to 25 feet and that the freeboard and water level monitoring requirements for the Upper Pond in License Condition Nos. 45(A) and (C) be deleted because the Upper Pond is now dry. In addition, RAMC requested a revision to License Condition No. 54 to allow the disposal of sediment from Bisco Lake at the toe of the Upper Embankment.

Presently, the freeboard requirement for the Lower Pond is 11 feet. In the analysis performed to determine this amount of freeboard, it was assumed that during a Probable Maximum Flood the Bisco Lake embankment, which is located upstream of the Lower Pond, would fail and the entire Lake would drain into the Lower Pond. To reduce the 11 feet of freeboard, RAMC in its May 19, 1989 submittal proposed to drain Bisco Lake and to maintain it in an empty condition. Keeping it empty would be a license condition so in order not to violate that condition, RAMC requested that a new condition, 45 (F) be added to the license to allow a maximum of 30 days for removing excess water from Bisco Lake that accumulates during severe rainfall events or snow melt. This 30-day period would also apply to removing excess water from the Lower Pond under similar conditions.

Discussion

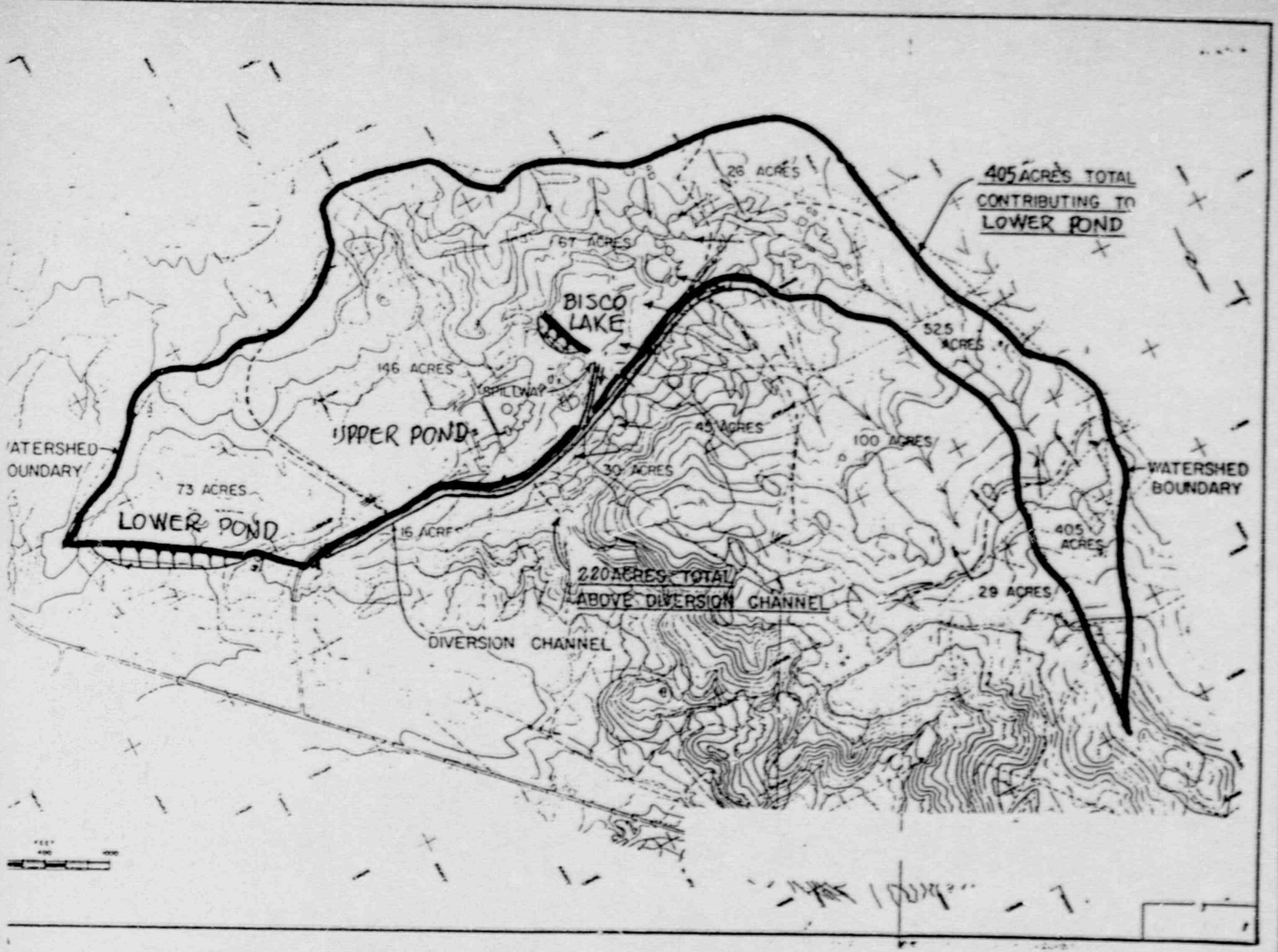
License Condition No. 45(A) requires that RAMC maintain at least 8.5 feet of freeboard in the Lower Impoundment through April 30, 1989, and at least 11 feet thereafter. License Condition 45(E) requires that the licensee submit to the NRC, by April 30, 1989, a proposal for engineering design modifications to increase the tailings impoundment capacity or to divert additional flood waters away from the tailings impoundments and Bisco Lake.

In the April 29, 1989 letter, RAMC addressed License Condition No. 45(E) by proposing to drain Bisco Lake and to clean up and dispose of the sediments left in the lake from the treatment of mine water over the past 11 years. Once this was accomplished, RAMC proposed to pump clean water into Bisco Lake to elevation 6720 feet for use in sprinkling the tailings in the Lower Pond. In subsequent submittals dated May 19, 1989 and September 28, 1989, RAMC advised NRC that they no longer intended to refill Bisco Lake to elevation 6720 feet. Instead, Bisco Lake would remain at elevation 6715 or lower and water for sprinkling the lower tailings would be obtained directly from wells.

In determining the current 11-foot freeboard required for the Lower Pond, the staff conservatively assumed that during a PMF, Bisco Dam would fail and its entire contents would drain into the Lower Pond. The 11 feet of freeboard therefore provides sufficient storage to contain the entire PMF runoff from a 405-acre upstream drainage area plus the entire content of Bisco Lake. The 405-acre area includes 186 acres upstream of Bisco Lake, plus 219 acres downstream of Bisco Lake (see Figure 1). The analysis performed in estimating the 11-foot freeboard requirement is conservative in that the entire volume in Bisco Lake was assumed to flow into the Lower Pond during a PMF. In reality, this would not occur because part of the PMF inflow to Bisco Lake would be diverted away from the Lower Pond.

Bisco Dam has a spillway at an elevation of 6727 feet. This is 17 feet below the elevation of the crest of the dam, which is at 6734 feet. During a PMF, water will flow through the spillway and into a diversion channel. Water that flows into the channel will be diverted away from the Lower Pond. In order to determine the volume of flood water that could flow into the Lower Pond, the staff independently calculated a PMF hydrograph for the 186-acre area upstream of Bisco Lake. This PMF was then routed into Bisco Lake and through the spillway. This analysis indicated that the maximum water level in Bisco Lake during a PMF would be 6728 feet. The storage at this elevation is 95 acre-feet. Assuming that Bisco Dam would fail when the lake was at its maximum level, would result in the release of 95 acre-feet of water, which would drain into the Lower Pond. Adding to this, the PMF volume from the 219-acre area downstream of Bisco Dam results in a total runoff volume of 223 acre-feet. The Lower Pond must therefore have sufficient freeboard to provide storage for this volume of runoff in addition to an allowance for windwave runup. The staff performed an analysis to determine the windwave runup during a PMF and concluded that a total freeboard of at least 6.8 feet is required for the Lower Pond. On the basis of this analysis, the staff concluded that a minimum freeboard of 8.5 feet proposed by RAMC is acceptable.

In the past, RAMC has had difficulty maintaining an adequate amount of freeboard during the winter months when ponded water does not evaporate as


405 ACRES TOTAL
CONTRIBUTING TO
LOWER POND
26 ACRES
67 ACRES
BISCO
LAKE
525
ACRES
146 ACRES
SPILLWAY
UPPER POND
45 ACRES
100 ACRES
30 ACRES
WATERSHED
BOUNDARY
73 ACRES
LOWER POND
15 ACRE
405
ACRES
220 ACRES TOTAL
ABOVE DIVERSION CHANNEL
29 ACRES
DIVERSION CHANNEL

quickly as it does during the warmer summer months. To alleviate this situation, RAMC has proposed a lower freeboard requirement of 5 feet during the winter months. The justification for this is that the PMF is a summer phenomenon so it is extremely unlikely that a PMF will occur during the winter months.

To determine if 5 feet is an adequate amount of freeboard during the winter months, the staff had to estimate the maximum amount of rainfall that could reasonably be expected to occur during the winter. To do this, the staff utilized Hydrometeorological Report No. 53 (HMR-53) which has monthly PMP estimates. The information in this HMR does not extend far enough west to cover the Rio Algom site, but it does provide some indication of the annual variability of PMP. When used together with HMR-49, which does provide PMP values for the site, it is possible to estimate the winter PMP. Using HMR-53, the staff determined that the maximum monthly rainfall during the winter months of October-April is about 50 percent of the PMP. The 6-hour PMP for the site, from HMR-49, is about 9.1 inches. Therefore, the staff used 50 percent of this (4.6 inches) to estimate the freeboard required during the winter months. Assuming that 4.6 inches of precipitation falls over the 405-acre drainage area upstream of the lower impoundment (see Figure 1) results in a runoff inflow volume of 155 acre-feet. The lower impoundment must therefore have sufficient storage available to store this volume plus an adequate allowance for windwave runup. On the basis of this analysis, the staff determined that a minimum of 4.5 feet of freeboard is required in the Lower Pond during the winter months. Therefore, the 5 feet proposed by RAMC for the period of November 1 through April 30 is acceptable.

The staff thus concludes that a minimum freeboard of 8.5 feet during the period of May 1 through October 31 and at least 5 feet during the period of November 1 through April 30, as proposed by the licensee, is adequate for the lower impoundment. License Condition No. 45(B) should therefore be amended as discussed below.

In addition, License Condition No. 45(E) should be deleted since RAMC complied with this license condition by submitting their letters dated April 29, 1989, May 19, 1989, and September 28, 1989.

License Condition No. 45(D) requires that a minimum 100 feet of beach be maintained between the crest of the Lower Tailings Dam and the ponded water. RAMC proposes to reduce this requirement to 25 feet. The reason for this proposal is that by maintaining 100-feet of beach, there will not be an adequate amount of ponded water for keeping the tailings wet in order to minimize wind dispersal of tailings. Reducing the beach from 100 feet to 25 feet increases the amount of storage capacity available to pond water and allows more efficient use of the sprinkler system in the Lower Pond.

The staff reviewed the information provided by the licensee and since the mill is no longer operating, the amount of water in the Lower Pond is much less than it was during operation, so a smaller beach is acceptable. The staff therefore concludes that 25 feet of beach is adequate.

The next license amendment requested by RAMC is that the freeboard and water level requirements for the Upper Pond License Condition Nos. 45(A) and 45(C) respectively, be deleted because the Upper Pond is now dry. No flood storage capacity is available in the Upper Pond because its lowest point is drained directly into the Lower Pond through three culverts. The staff agrees that since there is no longer any ponded water in the Upper Pond, the requirements for monitoring the depth of water and amount of freeboard in License Condition Nos. 45(A) and 45(C) are meaningless and should therefore be eliminated.

As discussed above, RAMC proposes to remove the sediments from Bisco Lake. In their May 19, 1989 letter, they proposed an amendment to License Condition No. 54 to allow disposal of the Bisco Lake sediments at the toe of the Upper Embankment. License Condition No. 54 authorizes RAMC to dispose of 20,000 cubic yards of contaminated materials and soils at the toe of the Upper Embankment. The disposal location is within the proposed eventual reclamation outslope (10H:1V) of the Upper Embankment. Disposing of the sediments from Bisco Lake would increase the volume in License Condition No. 54 from 20,000 cubic yards to 35,000 cubic yards. To assess the acceptability of disposing of 35,000 cubic yards at the toe of the Upper Embankment, the staff estimated that the depth of disposed material would be about 5 feet. The staff also estimated that the post-reclamation depth of cover over the 5 feet of waste will be greater than 50 feet. Because of the large amount of fill that will be required to reclaim the pile, 35,000 cubic yards of waste material placed at the toe of the Upper Embankment will not affect the stability of the reclaimed pile. Therefore, increasing the amount of waste permitted to be placed at the toe of the Upper Embankment from 20,000 to 35,000 cubic yards is acceptable.

Conclusion

Based on a review of the licensee's requests for amendment dated April 20, 1989, May 19, 1989, and September 28, 1989, and on independent calculations, the staff recommends that Source Material License SUA-1119 be amended by revising License Condition Nos. 45(A), 45(B), 45(C), 45(D), 45(E) and 54, and by adding License Condition No. 45(F) to read as follows:

45. The licensee shall comply with the following:

A. DELETED by Amendment No. 24.

B. For the lower tailings pond, the licensee shall maintain at least 8.5 feet of freeboard during the period of May 1 through October 31 and at least 8.5 feet of freeboard during the period of November 1 through April 30, between the maximum pond operating level and Stage I dam crest elevation of 6651 feet msl. Further, the licensee shall maintain at least 7.5 feet of freeboard during the period of May 1 through October 31 and at least 4.0 feet of freeboard during the period of November 1 through April 30, between the maximum pond operating level and the Stage II dam crest elevation of 6661 feet msl.

C. The water level in the lower tailings pond shall be read and recorded weekly, unless the pond is receiving tailings, in which case, the water level will be read and recorded daily.

D. During normal operations, at least 25 feet of beach shall be maintained between the crest of the lower tailings dam and the ponded water.

E. DELETED by Amendment No. 24.

F. After heavy storm runoff, the licensee shall drain Bisco Lake back to an elevation of 6715 feet msl or less and the lower tailings pond water level to levels specified in License Condition No. 45(B) above, as soon as possible, but in no case longer than thirty (30) days.

54. In accordance with submittals dated February 21, March 31, May 19, and September 28, 1989, the licensee is authorized to dispose of a maximum of 35,000 cubic yards of coal ash, contaminated mill wastes, soil, waste rock, and Bisco Lake sediment within the location shown in the licensee's March 31, 1989 submittal. Materials will be disposed of according to procedures described in the March 31, 1989 submittal. The disposal shall be completed by August 31, 1990, and shall be documented.

Raymond O. Gonzales
Project Manager

Approved by:
Edward F. Hawkins
Branch Chief

Case Closed: 04008084160R

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