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WMUR:TLJ
Docket No. 40-3453
04003453022S

MEMORANDUM FOR: Docket File No. 40-3453

FROM: T. L. Johnson, Project Manager
Operating Facility Section II, WMUR

SUBJECT: REVIEW OF INTERIM AND FINAL STABILIZATION OF MOAB WASH CHANNEL - ATLAS' MOAB MILL - AMENDMENT NO. 9, SUA-917

BACKGROUND

On September 9, 1980, the NRC staff issued License Condition No. 16, which required Atlas Minerals to construct and place sufficient riprap to prevent the erosion of Moab Wash and the toe of the existing embankment. This condition required Atlas to provide this protection by April 30, 1982.

In January 1982, the NRC staff issued Draft Staff Technical Position WM-8201, "Hydrologic Design Criteria for Tailings Retention Systems." This position suggested revisions to the previous design criteria of Regulatory Guide 3.11, which required the prevention of erosion during an occurrence of the Probable Maximum Flood (PMF). The new position suggests that erosion of the channel can occur, but should not be so great as to result in the release of tailings during an occurrence of the PMF during the operational period of the mill.

Atlas Minerals inquired about specific options open to them with regard to the requirements of existing License Condition No. 16 and the effect of the new position on those requirements. On April 14, 1982, a site visit was made by the NRC staff to the Atlas site to assess existing hydrologic conditions and to meet with Atlas with regard to the options available to them.

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DISCUSSION

After arriving at the site on April 14, 1982, I walked the entire length of the Moab Wash Channel (on Atlas property). I made several observations pertinent to the hydraulic design of the channel:

1) The riprap placed along the dam embankment on the upstream end of the channel (Upstream of Section B as shown on Exhibit H of the licensee's submittal dated October 3, 1978) appears to be fairly well-graded and suitable to provide adequate protection for the embankment during a major flood event.

2) That portion of the channel in the vicinity of the barium chloride (BaCl) treatment ponds is physically located about 150 feet from the toe of the dam embankment. The capacity of this portion of the channel could be benefically lessened by decreasing the height of the berm (the berm is actually soil piled up randomly) between the channel and the mill area. Also, the height of the berm could be lowered downstream from the existing ore pile. By lowering the elevation of the berm to an elevation less than that of the right bank of the channel (looking downstream), the amount of water to be carried (and thus the channel velocity) would be decreased, without significantly affecting the PMF water surface elevation.

3) The BaCl ponds should be filled to provide additional protection against flood erosion toward the tailings embankment. At the present time, the ponds appear to be about 8-10 feet deep and are almost empty.

4) At the upstream end of the BaCl ponds on the right bank of the channel, poor hydraulic conditions exist for the smooth passage of flow along the embankment toe. Undesirable flow currents could be formed in this area, increasing the likelihood of embankment erosion. This area should be regraded starting at the access road and progressing downstream to the BaCl ponds.

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OPERATIONAL PERIOD (Interim)

In order to assess the potential for erosion in the diversion channel, I performed an independent analysis of the erosion that would be expected during a single occurrence of a PMF. This analysis was performed using Corps of Engineers Hydraulic Design Criteria 722-4, which predicts scour as a function of time and discharge for culverts. My analysis was performed for conditions that would exist if the work recommended above were to be performed.

Based on this analysis, I predicted that approximately 150 feet of erosion would occur toward the dam embankment. The erosion would thus reach approximately to the dam toe, possibly causing erosion of the dam toe, but no release of tailings. This would be an acceptable situation during the mills' operational period when personnel would be available to effect repairs to the channel and embankment. However, if Atlas did not perform the work suggested in the staff observations listed above, the erosion during a PMF would be more than 150 feet, and erosion of tailings would likely occur.

The decrease in the height of the left channel bank was discussed via telecon with Mr. R. Blubaugh, Atlas, on June 25, 1982. Mr. Blubaugh proposed that the height of the left bank be decreased in the following manner: a) from Section A to 300 feet downstream of Section A, the left bank shall be at a lower elevation than the right bank, and b) from 300 feet downstream of Section A to Section PT-4, the left bank shall be three feet lower than the right bank.

It should be emphasized that my independent erosion calculations were based on a channel configuration which incorporates the recommendations discussed above. The licensee will be required to submit engineering plans and drawings for the modifications so that the staff may verify that the appropriate channel configuration will be constructed. The staff will require that the plans and drawings be submitted for NRC review and approval by November 1, 1982.

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The staff will also require that the NRC approved modifications be implemented by June 1, 1983. This is a reasonable period of time since the probability of a major flood occurring during this time period is very remote. Completion of the modifications by June 1 would also ensure that the embankment was protected during the summer season, when large floods would be most likely to occur.

The staff concludes that implementation of the plan discussed above meets the criteria of Draft Staff Technical Position WM-8201 during the operational period of the mill.

RECLAMATION

The staff position regarding reclamation requires that the design of a channel or diversion ditch prevent erosion of tailings over the long term (i.e., several large floods) without the necessity for maintenance. This will require that the Moab Wash channel (1) be relocated so that it is further from the tailings, or (2) be extensively riprapped to prevent damage to the channel and subsequent erosion toward the tailings.

Moab Wash cross-sections from earlier submittals indicate that the Moab Wash channel was rerouted to its current location to allow for construction of the mill. Relocating the channel to its original location would move it further from the tailings pond. Should Atlas choose this option, the staff will require that the licensee provide detailed plans along with an analysis which shows that the erosion of tailings will not occur over the long term.

The requirements for extensive riprapping of Moab Wash are satisfied by a design submitted by Atlas by letter dated December 3, 1979. The only exception is that the December 3 submittal did not include a provision for toe treatment for the riprap. Should Atlas choose this option, the staff will require that the licensee submit details of the toe treatment to be provided.

The staff will require that the licensee provide a commitment to implement one of the options discussed above, and to provide the

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additional information required for that option, by June 1, 1983. This date will correspond with the date specified for completion of operational period modifications to Moab Wash.

CONCLUSION

The operation and reclamation period modifications to Moab Wash were discussed and agreed to via telecons on June 4 and June 25, 1982 between R. Blubaugh, Atlas; and P. Garcia, H. Pettengill, and T. Johnson, NRC.

Based on the analyses performed by the staff, it is recommended that Source Material License SUA-917 be amended by revising Condition No. 16 to read as follows:

16. The licensee shall, by November 1, 1982, submit for NRC review and approval in the form of a license amendment detailed engineering plans and drawings for interim operation phase modifications of Moab Wash between cross-sections A and PT-4 as shown on Exhibit H of the licensee's submittal dated October 3, 1978. These modifications shall be as follows:

    a) The barium chloride (BaCl) ponds located at the toe of the embankment shall be backfilled.

    b) The right bank (looking downstream) of Moab Wash in the vicinity of Section A and the upstream end of the BaCl ponds shall be regraded to exhibit smooth hydraulic characteristics (i.e., the right bank of the channel shall be graded to form a continuous even surface with no depressions, pockets, debris or uneven slopes present to produce undesirable local flow turbulence during an occurrence of a PMF).

    c) The left bank (looking downstream) of Moab Wash shall be regraded as follows: a) from Section A to 300 feet downstream of Section A, the left bank shall be at a lower elevation than the right bank; b) from 300 feet downstream of Section A to

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Section PT-4, the left bank shall be three feet lower than the right bank.

The NRC approved modifications to Moab Wash shall be completed by June 1, 1983.

In addition, the licensee shall, by June 1, 1983, submit for NRC review and approval in the form of a license amendment a proposed plan for the final reclamation phase modifications to Moab Wash which implements one of the following options:

(a) The licensee shall provide detailed plans for the installation of riprap protection as specified in their submittal of December 3, 1979, including a toe which meets the criteria specified in the December 3, 1979 submittal.

(b) The licensee shall provide detailed plans for the relocation of Moab Wash. These plans shall be accompanied by an analysis which shows that erosion resulting in the release of tailings will not occur over the long term.

The June 1, 1983 submittal shall include a breakdown of estimated costs for implementing the preferred option.

Original signed by

T. L. Johnson, Project Manager
Operating Facility Section II
Uranium Recovery Licensing Branch
Division of Waste Management

Original signed by

Approved by: _____
H. J. Pettengill, Section Leader
Operating Facility Section II
Uranium Recovery Licensing Branch
Division of Waste Management

Case Completed: 040034530225

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