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April 25, 1980



Mr. Pete Garcia  
Mill Licensing Branch  
Waste Management Division  
U. S. Nuclear Regulatory Commission  
7915 Eastern Avenue  
Silver Springs, Maryland 20555

Dear Mr. Garcia:

This letter contains the results of my visit to Moab, Utah to make the final inspection of the Atlas Minerals tailings structure. The inspection took place in the company of Mr. Joe Tapia of NRC and Mr. Gordon Swanby and Mr. Larry Jacobs of Atlas Minerals.

Prior to the inspection I reviewed a report from Dames and Moore entitled, "Report on Construction, Inspection and Embankment Monitoring Program, Tailings Dam Expansion Project, Moab, Utah, for Atlas Minerals". This report simply outlined the design and specifications for the tailings structure and reported the field control testing program and earth work observations. The field controlled testing consisted of three types of tests including gradation tests, compaction tests and field density tests. The gradation tests were utilized to determine if the material being placed conforms to the new material utilized for embankment design. A total of 21 tests was performed and the test results indicate that the materials being placed are in substantial agreement with the design materials.

Compaction tests were performed on the fill materials to determine the maximum dry densities and optimum moisture contents of the soils. The results of compaction tests are then used to determine the in-place densities which are necessary. Density tests are then performed in the field as the filling takes place and compared to the results of the compaction tests.

Field density tests were performed in accordance with ASTM Designation D-1556-64 which is the sand cone method of density determination and also ASTM Designation D-2922 which is the nuclear method of density determination. Design criteria for the embankment called for 95 percent of the maximum dry density as determined by the compaction tests. The compaction test standard utilized was the more stringent of the two types of compaction tests normally used in the United States. The selection of this test standard results in a much higher relative density.

One hundred thirty-six field density tests were taken on the estimated 293,000 cubic yards of placed fill material. This results in a ratio of one test to approximately 2000 cubic yards of material placed, which in my opinion, is a reasonable ratio.

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Mr. Pete Garcia  
Page 2  
April 25, 1980

Of the 136 field tests taken, 16 tests or 11 percent of the tests failed which is a reasonable number considering the expertise of the contractor.


Piezometer readings were taken daily during the construction process and the results are included in the Dames and Moore report. The results of the monitoring program indicate that there was no substantial rise in the piezometric level during the construction process.

Our on-site visual inspection indicates that the embankment is operating in essentially the proper manner. However, the design called for a 150-foot wide beach on all sides of the pond in order to protect the embankment from wave action. The western embankment does not have such a beach at this time and a minor amount of erosion is taking place. A field crew was constructing the discharge system on the western embankment at the time of our visit and Mr. Ray Anderson, tailings pond supervisor, indicated that most of the western embankment would have a beach within one or two weeks. This estimate was later confirmed by Mr. Wayne Jensen, mill supervisor. It is my opinion that NRC officials should confirm the presence or absence of such a beach within a reasonable time period. The entire embankment is constructed of materials that are easily erodeable and which are not protected by any means other than the beach.

Mr. Jacobs is in charge of the inspection program of the embankment during its operational lifetime and I am personally satisfied that the program is adequate. The program includes a monthly monitoring of the existing 33 piezometers and one or two daily visual inspections. Daily inspections are under the supervision of Mr. Ray Anderson who has been on the site some 20 years and is fully aware of the operational problems of the embankment. Piezometer monitoring is handled by Mr. Jacobs who reduces the actual piezometric levels to elevations and plots these data to determine a month by month relative level. He assured me that should there be a sudden increase in piezometric levels, their consultants, Dames and Moore, would be immediately notified.

It is my opinion that the embankment was constructed in accordance with the design specifications in that the ongoing embankment monitoring program is adequate. Should you have any questions, please don't hesitate to contact me.

Yours very truly,

  
Terry R. Howard, P.E.

cc: Dr. Phil Gustafson, Argonne National Laboratories  
Mr. Joe Tapia

17487