DOCKET NO. 40-3453

ATLAS MINERALS
DIVISION OF ATLAS CORPORATION

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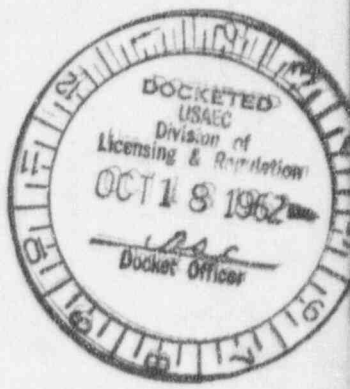
URANIUM REDUCTION COMPANY

Box 488 — Moab, Utah

R. F. HOLLIS
General Manager

October 11, 1962



Mr. R. Lowenstein, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D.C.

Dear Sir:

In accordance with your letter of April 27, 1962, reference 40-3453 DLR:DFH, the following information is submitted in support of our application to discharge to the Colorado River, effluent containing Radium 226 in concentrations greater than the limits specified in 10 CFR 20. Please note that the original application was made by Uranium Reduction Company which on August 17, 1962, became a Division of Atlas Corporation.

1. A detailed description of the area in which the mill is located including the following:

   (a) Location and size of nearby inhabited areas: The city of Moab is located three miles southeast of the mill. Approximately 6,000 people live in Moab.

   (b) Location of streams and rivers: See enclosed colored topographical map. (Exhibit 1).

   (c) Location of effluent stream showing point of discharge into the Colorado River: See enclosed black and white topographical map, area layout and several aerial and ground level photographs of the pond area taken during normal operating conditions. (Exhibits 2 and 3).

   (d) Points of water intake along the Colorado River which might be affected by the release of effluents: Because Moab is about 40 feet higher in elevation than the Colorado River, no water is taken from the river for drinking or irrigating purposes. A small farm is located one mile downstream and on the opposite side of the river from the mill. Irrigation water is taken from the river at this point. Samples taken at this location have shown no significant increase above concentrations upstream from the Moab mill. Eighteen miles downstream from the mill a potash plant is presently under construction. Process water will be taken from the Colorado River. The next inhabited area is at Page, Arizona, approximately 200 river miles downstream.

copy of text only provided for convenience

See Report Title for encls.

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2. Liquid effluent survey results for 1961, including sampling locations: See Exhibits 1 and 4.

3. Step - by - step procedure for radium, uranium, and thorium analysis: See Exhibits 5, 6, and 7.

4.(a) Description of the retention capabilities and integrity of our tailings dam and conditions that might lead to an accidental release of the waste: See enclosed colored prints of the dike and pond with communication from R. L. Curfman, Chief Engineer, to R. F. Hollis, Vice President. (Exhibits 8 and 9).

(b) Environmental effects of such a release: Any accidental release of the contents of the pond would flow directly to the Colorado River. The concentrations of radionuclides in the solution in the pond are such that no very great environmental effects should result from an accidental release. (Exhibit 4).

(c) Program of inspection and maintenance: During the day shift the Pond Man performs the duties outlined in the enclosed Pond Man Report Sheet. (Exhibit 10). The area is also inspected twice during the evening shift and twice during the night shift by operating personnel. Lights on the main tailings line make it possible to make repairs immediately. Roads at three levels around the periphery of the pond provide access to all parts of the dike.

(d) Seepage control: The geological and hydrological conditions are considered to be such that any seepage flows toward the Colorado River. The volume of water lost from the pond through seepage is not known, nor to what extent seepage has affected ground waters. However, a water well was drilled a few hundred feet west of the tailings pond. (Exhibit 2). Water was encountered at a depth of 135 feet. The water was sampled in November, 1961, and again in June, 1962, and contained radionuclides in the following average concentrations: Ra 226 0.046×10^{-8} uc/ml; Th 230 0.0015×10^{-6} uc/ml; and natural uranium 0.0005×10^{-5} uc/ml. These concentrations are consistent with those occurring naturally in water of this area.

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Seepage is controlled to some extent by the slime blanket which has settled on the bottom of the pond. (Exhibits 8 and 9). The enclosed screen analysis gradient illustrates this settling action. (Exhibit 11).

(e) Construction method: The original dike was made of compacted native soil keyed into the original ground as shown in Exhibits 8 and 9. The natural classification of the solid tailings has supplied the fill material for subsequent raises of the dike. (Exhibit 11). This natural classification deposits most of the sand particles nearest the dike with the slime fractions being carried farther out. As it becomes necessary, the sand inside the dike is allowed to dry, then pushed up, forming another level. In this manner, six feet of freeboard is maintained. To protect the inside side slopes from possible eroding wave action, the slope of the freeboard is quite gradual. Exhibits 8 and 9 show the freeboard to be six feet vertically by one hundred and sixty feet laterally. This effectively eliminates the possibility of dike erosion from within.

(f) Our reasons why the dam cannot be constructed to prevent overflow: As can be seen from the enclosed topographical maps, the land area available for pond expansion is limited. An average of about 2,000 gallons per minute of water and 1500 tons per day of solid tailings are discharged from the mill to the pond. The average evaporation rate with the pond at its present size has been calculated to be 257 gallons per minute. The volume of water contained in the pond would increase by about 2.5 million gallons per day, exclusive of seepage if the pond did not overflow. At present the land area within the dike is approximately 85 acres. Of this, 50 acres are inundated. Assuming 85 acres to be the maximum pond size, the vertical growth of the pond would be about 33 feet per year.

(g) Our reasons why the effluents cannot be treated to remove radioactive materials: Essentially all of the insoluble Ra 226 is removed from the effluent before it is discharged. This is done by maintaining a clear pond overflow from the main tailings pond and by utilizing a secondary settling basin. As out 1961 effluent surveys show, Ra 226 is the only radionuclide contained in our effluent in concentrations greater than the allowable limits. Some test work has been done to determine the effects of various

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compounds of barium on the Ra 226. The results of these tests were encouraging. However, data obtained to date is not sufficient to guarantee that the concentrations can be maintained below those specified in 10 CFR 20 on a continuous basis.

Our original application was based on the relatively low Ra 226 concentration in our effluent plus the magnitude of the dilution by the Colorado River. It was our feeling then, as it is now, that the intent of Section 20.106, 10 CFR 20, had been met and that the results of our effluent and Colorado River surveys were substantial proof that no individual was likely to be exposed to concentrations in excess of the limits specified in Appendix B, Table II, 10 CFR 20.

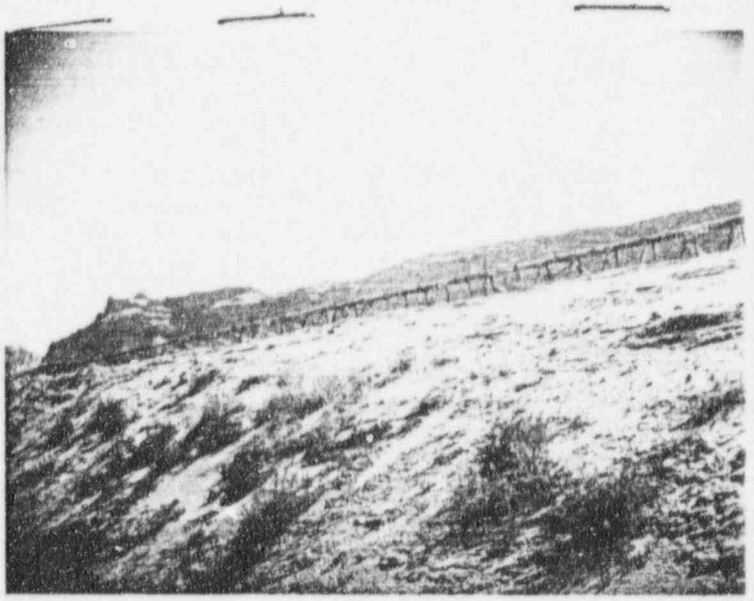
The 1961 river surveys represent 65 miles of the Colorado River below our mill. Beyond the last sample location is a 135 mile section of the river which passes through uninhabited country. The thorough blending received here plus the additional dilution from tributary streams should result in even lower downstream concentrations than those shown in the surveys.

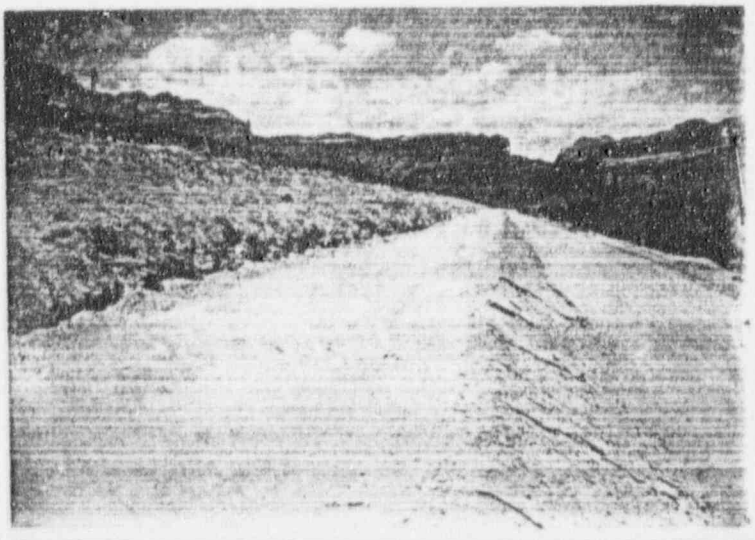
Yours very truly,

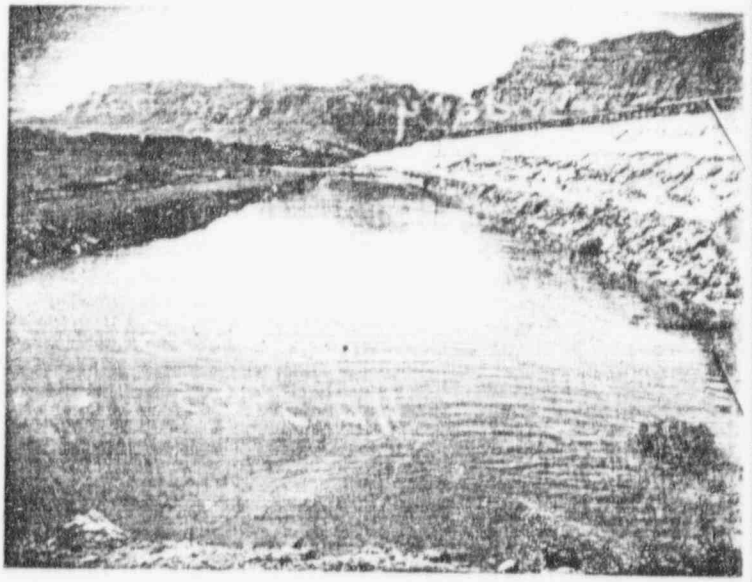
ATLAS MINERALS
Division of Atlas Corporation

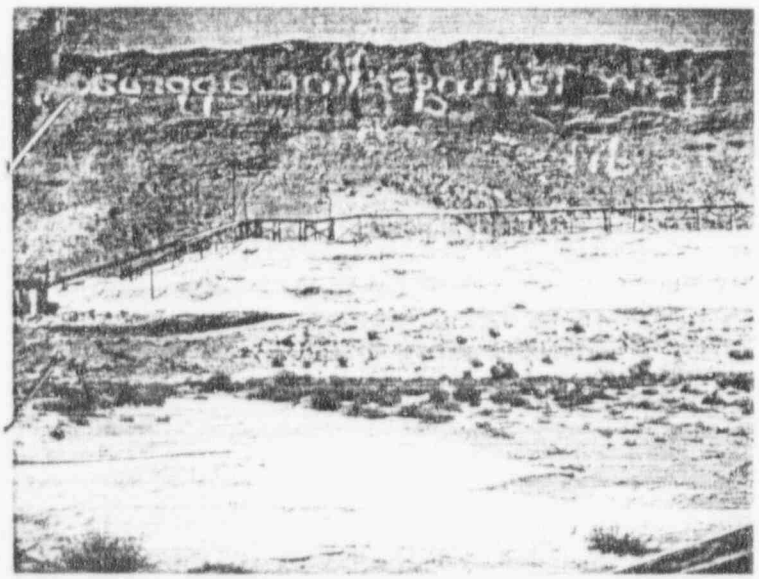
R. F. Hollis
Vice President

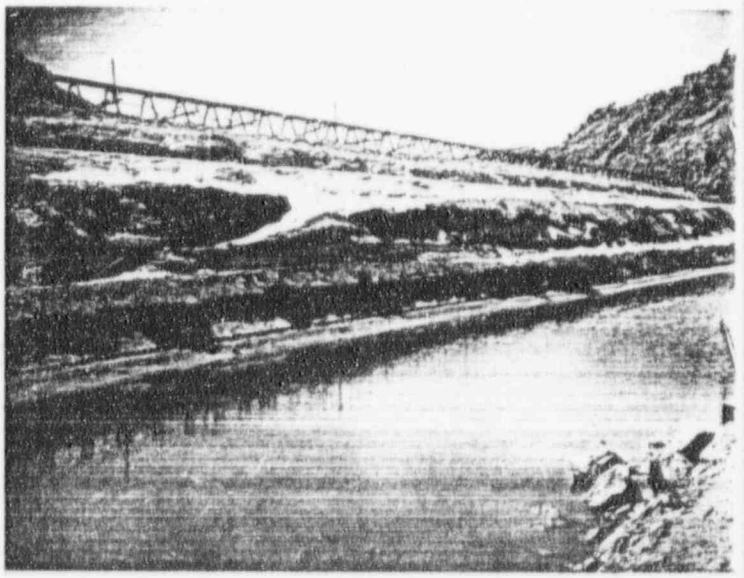
RFH/bj

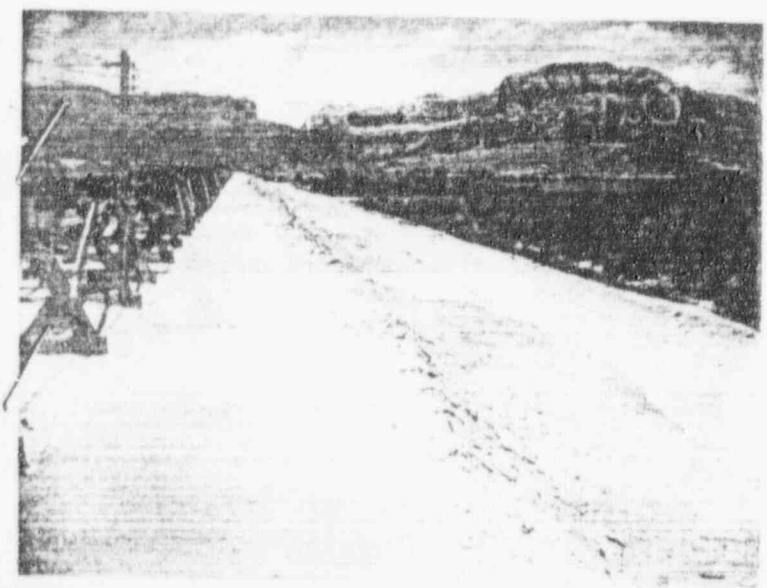


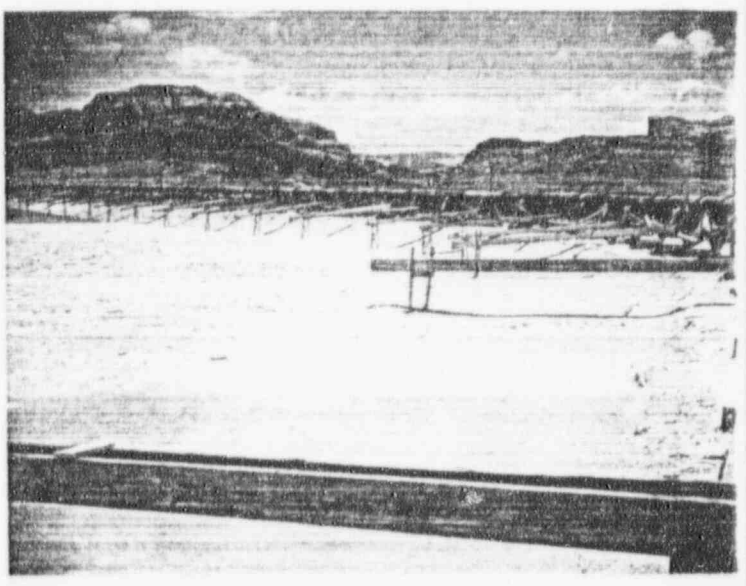


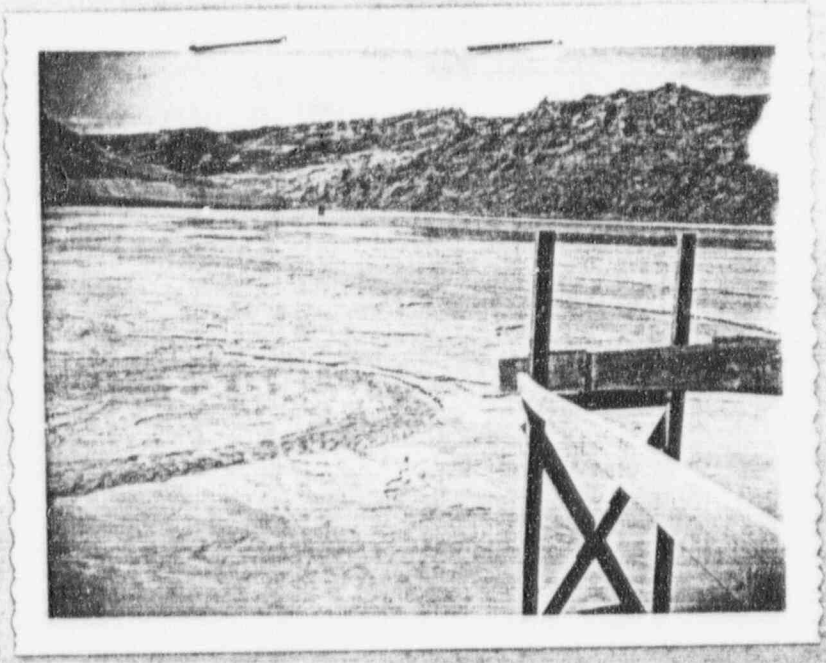












FROM: Atlas Minerals
Div. of Atlas Corp.
Moab, Utah

DATE OF DOCUMENT: 10-11-62
DATE RECEIVED: 10-18-62
NO.: 9628

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TO: R. Lowenstein
Div. of L&R

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CLASSIF.: U POST OFFICE REG. NO: 375

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DESCRIPTION: (Must Be Unclassified)
Ltr. ref. our 6-27-62 ltr. and submitting addtl. info as so requested.

ENCLOSURES: (2 cys. rec'd)
Exhibits 1 thru 11

(Only 1 set of photos rec'd)

REMARKS: Mail Room Distribution:
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