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URFO:NMS
Docket No. 40-3453
04003453590E

MEMORANDUM FOR: Docket File No. 40-3453

FROM: Noah M. Shopenn, Project Manager
Licensing Branch 2
Uranium Recovery Field Office, RIV

SUBJECT: REVIEW OF SEMI-ANNUAL ALARA PERFORMED FOR THE
ATLAS MINERALS, DIVISION OF ATLAS CORPORATION,
MOAB URANIUM MILL

By letter dated August 28, 1985, Atlas Minerals, Division of Atlas Corporation submitted the semiannual ALARA audit, conducted by the Audit Committee with the Radiation Safety Officer at the Moab, Utah uranium mill. The audit included information generated from January 1 to December 31, 1984. The information was provided in compliance with License Condition No. 46 C. of Source Material License SUA-917.

The ALARA audit evaluated the radiation safety program at Atlas Minerals Division, Moab, Utah Uranium Mill. The audit followed the format presented in Section 2.3.3 of Regulatory Guide 8.31. Each area is reviewed below.

MILL RADIATION PROTECTION AND MONITORING

1. Employee Exposure to U-nat

Records of exposure was maintained for all personnel exposed to U-nat. It was noted by the reviewer that the mill did not separate the exposure results by areas in which personnel worked. It was also noted that the mill ceased active operation in April 1984 and has been in standby condition since that time. The high monthly exposures for U-nat ranged from 71.48 to

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4.64×10^{-11} uCi hr/ml/month to a range of low monthly exposures of 18.65 to 1.73×10^{-11} uCi hr/ml/month indicating a significant trend downward of exposures. The average was from a high of 41.9 to a low of 2.16×10^{-11} uCi hr/ml. Allowable limits are 867×10^{-11} uCi hr/ml/month.

2. Employee Exposure to Radon Daughters

Records of exposure to radon daughters was maintained for all personnel. The exposure conditions were the same as described in the previous paragraph. High exposures ranged from 0.44 WLM to $.002$ WLM, the lowest ranged from 3.9 to 0.3 WLM, and the average ranged from $.016$ to $.002$ WLM. The limit is $.33$ WLM. The reviewer noted that the trend was a moderate decrease in exposure.

3. Bioassay and In Vivo Counting

Records of bioassay analysis was maintained by the licensee for all personnel subject to exposure. The high exposures ranged from a high of 30.68 to 6.54 ug/l U-nat, lows ranged from 6.54 to 0 , and the average ranged from 6.54 to 2.03 ug/l U-nat. For six of the eight months the mill had been shut down in 1984, entries were not made in the mill and bioassays not taken. In one of the months only one bioassay was collected. The reviewer noted that two bioassays exceeded the 15 ug/l of U-nat on the 48-96 hour sample collection. These were 20.7 and 30.68 ug/l respectively and that the next day bioassays were less than 5 ug/l U-nat. It was noted that a moderate decrease in the higher exposure levels was noted for 1984 as well as an increase in the lower levels of exposure. The reviewer deduced that the increase in the lower levels of exposure was due to a smaller population of workers in the facility.

In vivo counting of personnel had not been performed in 1984. The next schedule for in vivo counting is in 1985. The reviewer noted that the last in vivo count was in 1983. This was in accordance, in part, with License Condition No. 12 to have such counts made every two years.

4. External Gamma Exposure

Monthly personnel gamma exposures ranged from 70 to 15 mrem/month for highs, 20 to 0 mrem/month for lows, and 24 to 3 mrem/month for

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the monthly averages. The reviewer noted that these external exposures to personnel dropped significantly from previous years.

Mill gamma exposure rates were measured at 36 locations for the first three quarters of 1984 with 5 locations measured in the last quarter. The change was the result of the mill being in a standby, non-operating condition and on a license amendment which reduced sampling schedule. The reviewer observed that there was a general trend toward reduced exposure rates throughout the facility.

5. Surface Contamination

Surface contamination surveys were performed at two week intervals in all eating areas throughout the mill complex. Offices and doghouses surface contamination surveys were conducted on the same frequency with the exception of some offices in the main office building which were performed quarterly. The reviewer observed that a slight trend toward lower contamination levels was noted in the results.

It was observed, by the reviewer, that there was a significant trend downward in the levels of fixed and removable contamination on equipment released for unrestricted use.

The reviewer noted that the licensee did not report on personnel contamination surveys for the 1984 period. This may have been due to the reduced activities after the mill stopped operating; however, it did not relieve the licensee from his commitment to perform independent quarterly audits on personnel working or frequenting the mill during this period.

6. Air Sampling

The yellowcake stacks and ore stacks were sampled as required for the first quarter of 1984. The mill ceased processing ore and yellowcake at the end of the first quarter of 1984. Due to the short period of activity, the reviewer determined that there had not been enough samples taken to have indicated any significant trends.

General Air Samples were collected weekly, monthly, and quarterly depending on the location and analyzed for U-nat. Forty-eight locations were sampled in the first nine months of 1984 and at 7 locations for the remainder of 1984. The reviewer noticed a

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significant drop in the U-nat activity results from the time the mill was shutdown until the end of 1984. The maximum activity detected was 1.33×10^{-11} uCi/ml in the U_3O_8 packaging area, with the average about 0.1×10^{-11} uCi/ml. Radon daughter air samples were collected at the same locations as the U-nat samples with areas being sampled on a monthly or quarterly frequency. The maximum was .0748 working levels detected above the fine ore bin in April 1984. The maximum exposure rate was 14.5% of the permissible limit of 0.33 working levels Radon. Since the mill has been on standby, the reviewer observed there has been some reduction in radon emissions throughout the mill.

Breathing zone samples within the mill during operations in 1984 ranged from a high of $2.09 \text{ uCi} \times 10^{-11}$ /ml (during packaging area cleanup) to low of $.01 \text{ uCi} \times 10^{-11}$ /ml in the fire watchman's locations. The reviewer observed no decrease in values since the mill has been on standby. The only exceptions were noted above for the high and low. The reviewer also noted from the ALARA report and an in-house file check that no overexposures to personnel occurred during 1984.

CONCLUSION

The licensee submitted an ALARA report which evaluated the areas required by Regulatory Guide 8.31. The action complied with License Condition No. 46 C. of Source Material License SUA-917. The ALARA audit revealed minor deviations in the inspection program.

This is the first ALARA report submitted by the ALARA committee and the second by the licensee. The Uranium Recovery Field Office expects to see minor corrections to the program as the present staff gains experience. With the mill being in a shutdown standby status, the reviewer believes the licensee's current effort is adequate.

/s/

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Licensing Branch 2
Uranium Recovery Field Office, RIV

Approved by:

/s/

Harry J. Pettengill, Chief
Licensing Branch 2
Uranium Recovery Field Office, RIV

Case Closed: 04003453590E

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