ATLAS CORPORATION

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RICHARD E. BLUBAUGH
Vice President of Environmental
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October 31, 1994

VIA FACSIMILE (301) 415-5397
Mr. Joseph J. Holonich, Chief
U.S. Nuclear Regulatory Commission
Hi-Level Waste & Uranium Recovery Projects Branch
Office of Nuclear Material Safety & Safeguards
Washington, D.C. 20555-0001

Re: **License No. SUA-917 - Docket No. 40-3453**
Dose Commitment to Nearest Residence, 1994

Dear Mr. Holonich:

In your letter dated August 26, 1994, which was received September 1, 1994, Atlas was requested to demonstrate compliance with Section 20.1302(b)(1) - annual dose limit to the individual likely to receive the highest dose from the operation. This transmits the requested dose commitment calculations for the residence nearest to Atlas uranium recovery millsite near Moab, Utah.

Based on data obtained from the ongoing monitoring program at the millsite, calculations were performed by Dale Edwards, the Radiation Control Coordinator, and were reviewed by an independent consultant. The results of the calculations indicate compliance with Section 20.1302(b)(1). The calculated internal dose commitment on an annualized basis for 1994 is 90.1 mrem to the lung, the most critical organ.

The calculations were based on data for the first half of 1994. Calculations using the complete 1994 data will be submitted by March 1, 1995.

I trust this information is sufficient to your request. Please contact me at your convenience should you have any questions concerning this submittal.

Sincerely,

Richard E. Blubaugh

cc: S. Manz, M. Gross, D. Potratz, D. Edwards

NL05
1/1

Memorandum

DATE: October 10, 1994

TO: Rich Blubaugh

FROM: Dale L. Edwards

SUBJECT: **1994 (First Half) DOSE CALCULATIONS FOR NEAREST RESIDENCE**

1. External Radiation Exposure*

#1 TLD (nearest residence) 1994 first half average:	17 mR/qtr.
#6 TLD (background) 1994 first half average:	11 mR/qtr.
Calculated exposure to nearest resident 1994 first half:	6 mR/qtr.
or 24 mR/year	

* Measured by Radiation Detection Company

2. Internal Radiation Exposure

(a) Inhalation of Airborne Particulates
1994 first half average net dose commitment:

			mrem to Lung	
Location	pCi/m^3		Not Weighted	Weighted
Nearest Residence	U-Nat	.000195	.034	.004
0.5mi (.8km) E	Th^{230}	.000248	.80	.096
	Ra^{226}	0	0	0
totals			.834	.10

Notes:

Dose committments for U-Nat was calculated by dividing net U-Nat concentration by two and applying dose conversion factors of U-238 and U-234 each to one-half the concentration then, summing these for the total U-Nat dose commitments as shown below:

Net U-Nat: .000195 ÷ 2 =	.0001 pCi/m^3
U-238: .0001 x 158 =	.016
U-234: .0001 x 180 =	.018
Net U-Nat:	.034 mrem to the lung

Dose conversion factor
(reference Table A-1 40 CFR 190)

Radionuclide	Lung
U-238	158
U-234	180
Th230	220
Ra^{226}	6610

Then using the weighting factor in 10 CFR 20 (revised) for the lung of .12

U-Nat: (.12)(.034) = .004 mrems
Th^{230}: (.12)(.80) = .096 mrems
Ra^{226}: (.12)(0) = 0 mrems

(b) Radon Dose Commitment 1994:

Dose calculations for Rn^{222}:

The following radon dose conversion factor was taken from Regulatory Guide 3.51 Appendix C:

$$\frac{5.0 \times 10^{-6}\ WL}{pCi/m^3} \times \frac{25\ WLM/yr}{WL} \times \frac{5000\ mrem}{WLM} = \frac{0.625\ mrem/yr}{pCi/m^3}$$

1994 data for the first half of year:

S1: 2.6 pCi/L avg.
S6: 1.4 pCi/L avg.
Difference: 1.2 pCi/L avg.

$$(1.2\ pCi/L)(10^3 L/m^3)\frac{.625\ mrem/yr}{pCi/m^3} = 750\ mrem/yr.$$

Then, using the weighting factor for the lung of .12 found in 10 CFR 20 (revised):

(750 mrem/yr.)(.12) = 90 mrem/yr. dose to lung

(c) Sum of Internal Dose

Radionuclide	Weighted Dose to Lung (mrem/yr)
U-Nat	.004
Th^{230}	.096
Ra^{226}	0
Rn^{222}	90.0
Total	90.10