

M-375
126491

Formerly Utilized Sites Remedial Action Program (FUSRAP)

ADMINISTRATIVE RECORD

for Maywood, New Jersey



U.S. Department of Energy

**RADIOACTIVE WASTE MANAGEMENT ASSOCIATES** FEB 15 9 11 AM '95

February 8, 1995

Angela Carpenter, Project Manager
Federal Facilities Section
US EPA, Region II
Javits Federal Building
New York, NY 10278-0012

Dear Ms. Carpenter:

Thank you for your letter to Jan 23, 1995 letter to Mr. Nolan of Concerned Citizens of Maywood. After reviewing your letter, I revisited RESRAD (we have version 5.05) to determine how it handled thoron and radon. My assumption that lead-212 daughter product of thoron gas was not treated as a pathway was based on the attached Figure 2.2 in which radioactive dust, due to resuspension, and radon, were the air pathways to humans. Radon progeny were also included in the radon dose. But, in fact, RESRAD does estimate levels of radon progeny in air, the ratio of lead-212 to thoron is estimated to be 0.015 (Eq. C-19, ANL/EAD/LD-2), and the lead-212 dose is calculated. Thank you for that correction. A copy of this letter is being sent to DOE and DEP informing them of my error.

Using RESRAD, I have still not evaluated to my satisfaction that either 5 or 15 pCi/g is a health-based standard. The problem here is that DOE contractors do not solely use RESRAD to calculate radiation exposures. Actual measurements for radon and thoron have also been introduced into risk calculations. I am positive that thoron gas has not been properly measured.

Proper measurement for thoron gas is an important issue which continues to be neglected. I don't disagree with your letter that thoron only near the surface will escape and that it will dissipate quickly in the environment. I also agree that thoron will not migrate through concrete basement floors. Nevertheless, in West Chicago, Illinois, where thoron gas has been properly measured by Region V and thorium concentrations in waste materials are comparable to those in Maywood, quite high levels of thoron gas, up to 56 pCi/L, have been measured by NRC contractors in a public park, Reed-Keppler Park. This pathway is the largest component of radiation exposure to the local population using the park. As you are aware, there are quite a few properties in the Maywood area that have undisturbed soil and may have high levels of thoron gas. Unfortunately, DOE contractors have not properly measured for thoron gas, as I pointed out in previous correspondence. Since lead-212 has a 10+ hour half-life, a filtered gas sample must be

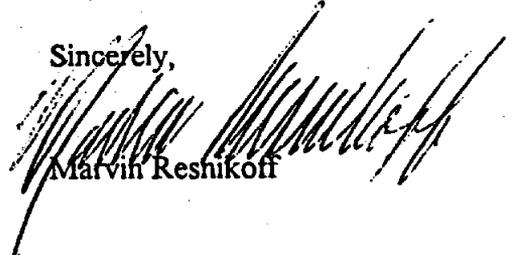
Marvin Resnikoff, Ph.D. ♦ Senior Associate

measured about five hours after capture and this was not done. Proper measurement does make a difference here, since the numbers are factored into the Baseline Risk Assessment and later into the Feasibility Study. Proper measurement may play a role in determining which areas should first be remediated and the level of remediation. Grassy areas with high thorium concentrations need to be remediated.

For your benefit I've enclosed the Jensen thorium study prepared for Region V. I think you'll also agree that thoron gas has not been properly measured for. DOE should be required to properly measure for thoron gas; the proper numbers should be reinserted into the Baseline Risk Assessment. Thank you for reconsidering this matter.

cc: M Nolan
N Marton
S Cange

Sincerely,


Marvin Resnikoff

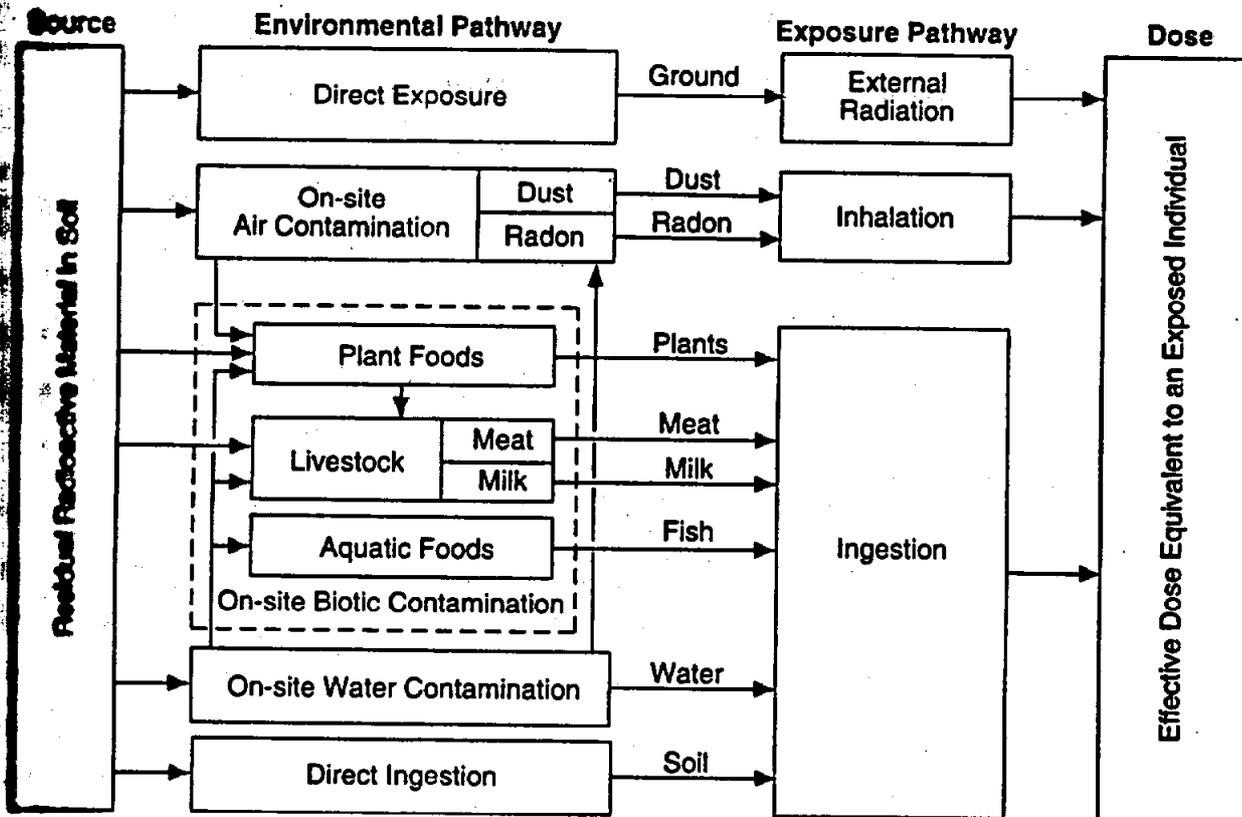


FIGURE 2.2 Schematic Representation of RESRAD Pathways

account in calculating soil guidelines.¹ The dose due to external gamma radiation is first calculated for an individual exposed continuously to radiation from an infinite contaminated area at a distance of 1 m from the ground surface. Correction factors are then applied for the finite area and thickness of the contaminated zone, shielding by a cover of contaminated soil (if $C_d > 0$; see Figure 2.1), irregular shape, shielding by the floors and walls of a house, and less-than-continuous occupancy. Quantitative details are presented in Section 3 and Appendix A.

2.2.3 Inhalation Pathways

Inhalation exposure results primarily from inhalation of radon decay products and contaminated dust. An inhalation pathway consists of two segments: (1) an airborne

The dose contribution from electrons (beta particles) is primarily restricted to the skin; the dose contribution from neutron radiation can be significant for some transuranic radionuclides and should be considered if neutron-emitting radionuclides are known to be present.