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June 15, 1979

Director
 Division of Waste Management
 Office of Nuclear Material Safety and Safeguards
 U.S. Nuclear Regulatory Commission
 Washington, D.C. 20555



Re: Comment on Draft NUREG-0511, Section 6.2.8.2.7.1

Dear Sir:

I have the following comment regarding the average individual occupational exposure estimates outlined in Section 6.2.8.2.7.1 of NUREG-0511. I believe that Th-230 should be included in the assessment of occupational exposure resulting from the inhalation of yellowcake dust. It is assumed in the report for the individual dose equivalent estimates for the lung, whole body, and bone of workers due to yellowcake dust inhalation that the doses arise solely from U-238 and U-234. Although the Th-230 activity concentration of yellowcake is assumed to be a factor of 20 less than those of the U isotopes (Page G-5 of NUREG-0511), the resultant dose equivalents from Th-230 inhalation, as a result of higher dose conversion factors, can be appreciable.

The Th-230/U-238 and Th-230/U-234 ratios of the assumed occupational inhalation dose conversion factors for ore dust are listed in the attached Table 1. The ratios range from 10-43. Table 2 lists the annual dose equivalents estimated in NUREG-0511 for occupational inhalation of uranium in yellowcake and annual dose equivalent estimates for inhalation of Th-230 in yellowcake obtained by use of the methodology outlined in Appendix G-5 of the report. The airborne Th-230 activity concentration of the yellowcake handling area is assumed to be 5% of the airborne U-238 concentration and the Th-230/U-238 occupational inhalation dose conversion factor ratios for ore dust are assumed to hold for yellowcake dust. The estimated Th-230 dose equivalent for the critical organ, bone, is approximately a factor of 2 larger than those for either of the two uranium isotopes. Inclusion of Th-230 in the dose equivalent estimates increase the total pulmonary lung, whole body, and bone dose equivalents due to yellowcake inhalation by 26%, 48%, and 104%, respectively.

Please consider the comment during revision of the report. Thank you.

Sincerely yours,
DAMES & MOORE

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Harold Tuchfeld

Harold Tuchfeld
Staff Geochemist/Health Physicist

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info only

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TABLE 1

Occupational Th-230/U-238 and Th-230/U-234 Inhalation
Dose Conversion Factor Ratios for Ore Dust^a

<u>Organ</u>	<u>Dose Conversion Factor Ratios</u>	
	<u>Th-230/U-238</u>	<u>Th-230/U-234</u>
Pulmonary Lung	11.0	9.7
Whole Body	20.5	18.0
Bone	43.3	39.7

TABLE 2

Average Occupational Internal Dose Equivalents Due
to Inhalation of Ore Dust^b

<u>Organ</u>	<u>U-238</u>	<u>U-234</u>	<u>Th-230</u>	<u>Total</u> <u>(U-238 & U-234)</u>	<u>Total</u> <u>(U-238 & U-234 &</u> <u>Th-230)</u>
Pulmonary Lung	7.38E+1	8.39E+1	4.06E+1	1.58E+2	1.99E+2
Whole Body	1.30E+1	1.49E+1	1.33E+1	2.79E+1	4.12E+1
Bone	2.20E+2	2.39E+2	4.76E+2	4.59E+2	9.35E+2

^a The dose conversion factor are listed in Table G-5.2 of NUREG-0511.

^b The U-238, U-234, and total U-238 and U-234 dose equivalents are listed in Table 6.18 of NUREG-0511.

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