Attachment 3

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6 December 1999

Mr. Randy Godfrey, Engineering Manager
U.S. Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Re: Contract No. DACA31-96-D-0006
Addendum to Justification for Derived Concentration Guidelines
St. Albans Veterans Administration Extended Care Facility, Queens, New York
WESTON W.O. No.: 10971-219-201-0001
DCN: VAHOSP-1001899-AABX

Dear Mr. Godfrey:

Todd Jackson requested clarification to two issues in the Addendum to Justification for Derived Concentration Guidelines document during a conference call on 11 December. The first was an explanation of the K_d value of 10 mentioned on page 6 of the addendum. The second was addressing the DCGL for concrete and bulk material on page 7.

From work on a job for Brookhaven National Laboratory, the measured K_d value for strontium is close to 10 (BGRR Sampling and Analysis Program for the Cleanup Verification of Soil and Disposal of Debris from the Removal of the Pile Fan Sump, Piping, and Above-Ground Ducts Working Draft, 10 September 1999). Considering that higher values are more conservative for the dose modeling at St. Albans and the RESRAD default value is 30, 30 was used to determine the DCGL for strontium-90 in soil. As seen from the analysis, K_d does not have a significant effect on the dose. Any value for K_d still results in a DCGL no less than 35 pCi/g.

The addendum equated bulk material with concrete when considering DCGL values. There was also no explanation of how the DCGL value for soil might be used for concrete. Conceptually, strontium in concrete is in a more stable configuration than strontium in soil. Concrete can be used for water barriers, consequently, water penetration and subsequent contaminant removal is not expected. The exposure pathways from soil that may contribute to dose in the St. Albans scenario are through plant the pathway. Direct exposure is not a pathway since strontium-90 or its daughter does not emit gamma radiation. A slab of concrete that is not degraded would have
no worse DCGL than that of soil. There is no direct exposure, plants do not grow in concrete, and ingestion or inhalation is not possible by definition.

? mm ·

However, degraded concrete could produce surface contamination. A worst case scenario assumes that the entire slab (uniform concentration of 35 pCi/g) was degraded to a depth of 0.5 mm and this was ground to a fine powder. Thus, in any 100 cm^2 of surface area, if 1/2 mm is converted to surface contamination, the strontium concentration is 35 pCi/g and the density of concrete is 2.25 g/cm^3 (Radiological Health Handbook), the resulting surface contamination level is 874 dpm/100 cm^2 as calculated below.

$100 \times \frac{1}{200} = 0.5\ cm^3$

$0.175\ pCi/g$

This value represents removable contamination and is at 10 percent of the recommended strontium-90 surface contamination level listed in the Justification for Modified Derived Concentration Guidelines, 24 June 1999.

Contamination in bulk material other than concrete is not addressed by this letter.

∴ Bulk material = concrete only

If you have any immediate questions or wish to discuss this, please do not hesitate to contact me at (847) 918-4137 or Michael Madonia at (847) 918-4087.

Very Truly Yours,

ROY F. WESTON, INC.

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Michael Van Der Karr
Senior Health Physicist

MVDK/ts

cc: H. Honerlah, CENAB,
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