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- 1 (Return to WM, 623-SS)

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NOV 12 1982

WMHL: 3109.6

Dr. M. J. Steindler  
Chairman, Materials Review Board  
Argonne National Laboratory  
9700 South Cass Avenue  
Argonne, Illinois 60439

Dear Dr. Steindler:

This letter is in response to your letter of October 13, 1982 requesting a Materials Review Board member vote for full-approval of MCC-12S, Test Method for Determining Density Changes in Actinide-Doped Waste Forms.

Although I consider most sections of the MCC-12S test procedure satisfactory for measuring the density of doped glass, I find Section 3.0, "Uses and Limitations," unsatisfactory since its second paragraph indicates that the test can be used to determine radiation induced volumetric changes in glass waste forms without identifying the need for consideration of other phenomena which may also affect volumetric changes. For example, it does not indicate the need to consider cracking, hydration, temperature changes and devitrification which may also cause volumetric changes affecting performance of a waste package. Hence, the subject test in combination with MCC-6 is not adequate to determine limits of volumetric changes in waste glass for waste package performance evaluation.

An additional comment pertains to equation (6) on page 12 of MCC-12S. This equation is confusing since it does not clearly distinguish between absolute density and changes in density. For example, at a dose of  $D=0$   $\rho(0)=0$  which appears incorrect. Therefore, considering the reservations indicated above I vote no for full approval.

If equation (6) is corrected and the second paragraph of the "Uses and Limitations" section is revised as indicated below, my vote would be yes.

Change the last sentence of the second paragraph of Section 3.0 and add two additional sentences as follows:

"...has no significant effect on volumetric changes caused by alpha decay alone. This method does not determine volumetric

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NAME	: FRCook:lmc	: MJBell	:	:	:	:	:
DATE	: 11/12 /82	: 11/ /82	:	:	:	:	:

changes to waste forms as a result of cracking, hydration, temperature changes, alpha decay at temperatures above 25°C, devitrification, etc. Hence this method in combination with MCC-6 is not adequate to determine limits on volumetric changes in waste forms for waste package performance evaluation."

Sincerely,

ORIGINAL SIGNED BY

Michael J. Bell, Chief  
High-Level Waste Licensing  
Management Branch  
Division of Waste Management

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