



**Department of Energy**

Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221

MAY 30 2007

Mr. Juan Reyes, Director  
Radiation Protection Division  
1310 L St, NW  
Room 507  
Washington, DC 20005

Dear Mr. Reyes:

As part of the DOE's planned change request to reduce the amount of MgO emplaced in the repository, the DOE submitted an analysis of uncertainties related to MgO effectiveness to the EPA in November, 2006. This uncertainty analysis included a report documenting a study of one aspect of geochemical uncertainties in the repository: *Consumption of Carbon Dioxide by Precipitation of Carbonate Minerals Resulting from Dissolution of Sulfate Minerals in the Salado Formation In Response to Microbial Sulfate Reduction in the WIPP* (Brush et al. 2006). This report contains limited geochemical calculations for the calcite precipitation process that predict high pH in repository brines under certain circumstances. On review it appears that these calculations do not adequately represent the conditions in the repository, and the existence of high pH in the WIPP is considered unrealistic. Reasons for this include: (1) the repository contains a large mass of iron, but the beneficial presence of iron is not included in the reference geochemical calculations, and (2) the process of methanogenesis has been excluded from the geochemical calculations, but almost certainly occurs to some extent within the repository and can have a significant effect on CO<sub>2</sub> production. In short it is our belief that the calculations reported in the referenced report are inappropriate, and are not correct for the *in situ* environment at WIPP. As such, the results included in Brush et al. (2006) should not be used as part of the technical basis for the EPA's decision process on the MgO planned change request. DOE requests that EPA withdraw this report from its consideration and from the docket. The DOE does not have plans to resubmit Brush et al. (2006) for this submittal, or at any date in the near future.

Withdrawal of Brush et al. (2006) from the MgO planned change request affects part of the uncertainty calculations that were documented in a second report: *Uncertainties Affecting MgO Effectiveness and Calculation of the MgO Effective Excess Factor* (Vugrin et al. 2006). This second report takes credit for calcite precipitation, based on the results in Brush et al. (2006). DOE also requests that EPA withdraw the current version of this report from its consideration and from the docket because it is based, in part, on the results of the same geochemical modeling. As we discussed during our

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meetings in January and April, 2007, calcite precipitation is not required to make the argument for emplacing a reduced amount of MgO in the repository. The DOE will therefore eliminate consideration of calcite precipitation from Vugrin et al. (2006) and resubmit the revised version of this report by June 30, 2007.

Sincerely,



David C. Moody  
Manager

cc:

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