HLWYM HEmails

From: Philip Justus
Sent: Monday, October 22, 2007 1:21 PM
To: Deborah DeMarco; Sunny Kim
Cc: John Stamatkos; Philippe Dubreuilh; Brittain Hill; Eugene Peters; Jeffrey Pohle; John Trapp; John Bradbury; Jack Guttmann; James Rubenstone; Randall Fedors
Subject: Acceptance of "Evaluation of (Nye Co Cross Sections) Based on...Aeromagnetic Anomalies:" CNWRA IM

Debbie, Sunny (and others who have a need to know). The NRC staff reviewed the CNWRA Intermediate Milestone (IM) report, "Evaluation of Regional Scale Geologic Cross Section Interpretations at Yucca Mountain Based on Modeling of DOE Aeromagnetic Anomalies Data," by S. Biswas and J. Stamatakos (IM 06002.01.292.730), dated September 14, 2007. The IM report is acceptable because it fulfills the requirement of the FY07 milestone to evaluate the potential of aeromagnetic data that were collected by DOE (presented in a 2004 report for the purpose of identifying buried basaltic volcanoes) that might be indicative of potential buried geologic structures (such as tilted rock strata and faults).

The general conclusions of the IM report and the attendant documentation are that: the staff is in general agreement with an interpretation by DOE of geologic cross sections in northern Crater Flat and Yucca Mountain, and is in general disagreement with geologic cross sections of Southern Crater Flat and Yucca Mountain. The IM report takes the DOE aeromagnetic data and the DOE interpreted geologic cross sections and generally compares and contrasts key structural geologic elements and rock-stratigraphic layers and their modeled magnetic anomalies to magnetic anomalies measured (observed) by DOE along the lines of the cross sections. The northern cross sections match the anomaly data reasonably well. The southern cross sections (Nye-1, -2,
-3) and magnetic data have mismatches that suggest greater uncertainty in those geologic cross section interpretations. The bases for the staff evaluations are discussed in the IM report.

The potential significance of the geologic cross sections lies in their use by DOE to model the ground water pathway(s) in alluvium and tuff in the saturated zone. Uncertainties in the models of the saturated zone based on geologic cross sections of tuff and alluvium (such as the Nye-1, Nye-2 and Nye-3 cross sections examined in this IM report) have the potential to affect understanding of flow paths and transport factors in the saturated zone. Therefore, the staff (and DOE) would need to consider uncertainties in the DOE Hydrogeologic Framework Model
(HFM-19 units; based on the cross sections shown in this report to have notable uncertainties), to the extent commensurate with DOE's reliance on HFM-19 to assess repository performance.

We propose two changes to the IM report to be made prior to its being made publically available: (1) Conclusions section - add a fifth possible major explanation for lack of correlation between calculated and observed magnetic anomaly data in Nye-1, -2, -3 cross sections, to the effect that there may be one or more substantially magnetic units/strata present among the buried rock layers along the lines of cross section that are not accounted for in the current geologic model (cross sections); and (2) Conclusions section - strengthen the conclusion at the last sentence by adding/changing statement(s), to the effect that the uncertainties in Nye-1,-2, -3 have the potential to affect the understanding of flow paths in the unsaturated zone and that a review of tuff-alluvium contacts will need to consider whether the uncertainties associated with relevant factors have appropriately considered the notable mismatches/uncertainties in HFM-19 demonstrated in this report.

This email closes Ticket: CNWRA 2007 0201, Rev due date 10/22/07. In my opinion, the original IM report should not be entered into the public record. The Center should submit a revised report with the changes proposed above. The revised report will be made publically available and distributed routinely. I'll be glad to address any questions the Center may have. The Center should notify me in two weeks of its plan and schedule to revise the report and so note that in the Program Monthly Management Report or the Commitment Control Log. The report was reviewed by Britt Hill, John Trapp and myself.

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