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LPDR

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Distribution:

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(Return to W.M. 620-SS)

MEMORANDUM FOR: Philip Justus, Acting Chief  
Geotechnical Branch  
Division of Waste Management  
Office of Nuclear Material Safety and Safeguards

FROM: Lee Abramson  
Human Factors and Safeguards Branch  
Division of Risk Analysis and Operations  
Office of Nuclear Regulatory Research

SUBJECT: GEOSTATISTICAL ANALYSIS OF POTENTIOMETRIC DATA IN THE  
WOLFCAMP AQUIFER OF THE PALO DURO BASIN, TEXAS  
(BMI/ONWI-587)

In response to your request of May 18, I have made a preliminary review of the subject report. In general, the geostatistical analysis appears to have been carried out in a competent manner. In particular, the kriging standard error contours in Figure 3-12 are an essential part of the analysis and allow an estimate of the uncertainty in the kriged potentiometric surface. However, it should be noted that the kriged surface in Figure 3-11 is constrained to pass through the observed points, i.e., the observations are assumed to be error-free. It is possible that a better representation of the potentiometric surface can be obtained using an alternate kriging technique which assumes an error structure for the observations. This should be investigated.

Other comments follow.

Page 2, Paragraph 1

The assumption of horizontal flow appears to contradict the statement on the bottom of page 3 that "the flow direction is downward."

Page 13, Paragraph 1

Where does the theoretical model come from? What is its relation to the linear trend surface fitted in Appendix B? A detailed exposition is needed.

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Page 13, Paragraph 6

There is no need to assume normality of the standardized residuals, since normality can be tested using the W test. (Since the sample size is larger than 50, the extended W test must be used.) If the hypothesis of normality is rejected, normality-inducing transformations of the data should be explored.

Page 14

It is not clear why the plotted semivariograms in Figure 3-9 are different from those in Figure 3-6. An explanation is needed.

Please let me know if you need a more thorough review of the report.



Lee Abramson  
Human Factors and Safeguards Branch  
Division of Risk Analysis and Operations  
Office of Nuclear Regulatory Research

cc: P. Ting