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Subject: OIG Assessment of EMFR 90 Day Response
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I would like to thank you for your prompt attention to this issue. In our audit report we recommended that you finish analyzing the geochemical and physical conditions that might lead to contaminants dissolving near the repository base; then confirm the adequacy of the repository design to prevent dissolved contaminants from being released under these conditions. Region 10 concurred with the recommendation and prepared a technical analysis. However, the Region's analysis included assumptions, with consequent conclusions, that the OIG believed required technical verification. The Region addressed these issues in its 90-day response to the final report. We do not believe that the information the region provided in the 90 day response fully addressed our concerns about assumptions that required technical verification. Specifically:

- I. Lateral infiltration modeling was not verified,
- II. Assumption of differing time periods used for recalculations of ground-water level rise,
- III. Assumption that ground-water level rise calculations would be unaffected by changes in porosity and gradient, and
- IV. Recalculations of ground-water level rise that do not address other substantial issues raised by OIG in Appendix B of the final report

We cannot close the recommendation until we have answers to these questions. Thanks

Issue	Specifics
1. Lateral infiltration modeling not reviewed	The technical reviewer did not review the lateral infiltration modeling, although we had raised several technical concerns about the modeling in Appendix B to the final report. Instead, the reviewer reiterated the modeling results as presented in the Executive Summary of the 90% Design Report. When the Region agreed in its June 17, 2009 memorandum to have the technical work verified, we expected review of all analyses. We need to discuss with Region officials why the lateral infiltration modeling was not reviewed.
2. Assumption of differing time periods used for recalculations of ground-water level rise	Another factor in the calculations of water-level rise is the time period over which the rise is estimated to occur. The original calculations in Appendix Q used a time period of 100 days, the period of overall water-level rise observed in one of the monitoring wells. The lateral infiltration modeling used an inundation period of 75 days, based on the time standing water was measured at the site in 2008. The technical reviewer, in his recalculations, chose 20 days based on the rise and fall of the flood wave observed in the nearby river. We do not agree that this is a reasonable estimate of time over which the ground water will rise. The reviewer's choice of a very short time period resulted in estimates of minimal water-level rise that do not reflect the uncertainties in these calculations. We need to discuss this issue with the technical reviewer.
3. Assumption that ground-water level rise calculations would be unaffected by changes in porosity and gradient	Porosity and gradient also factor into the calculation of water-level rise. A reduction in hydraulic conductivity would result in a decrease in porosity and an increase in gradient. Both of these parameter changes would result in higher estimates of water-level rise. The technical reviewer does not take into consideration these uncertainties. Instead, the reviewer estimates that the water-level rise for a 12-year-flood falls short of rising into the repository. One of his estimates has the rise falling short by only half a foot. Decreasing porosity by 10% and increasing the gradient by 10% results in an estimate that places ground water up into the repository. We need to discuss this issue with the technical reviewer.

Issue	Specifics
4. Other Issues	<p>The technical reviewer did not address a number of other issues we raised in Appendix B of the final report regarding these calculations. These issues include among others, variable settlement resulting in variable reduction in hydraulic conductivity and overestimation of the continuity and thickness of the compacting layer. On page 9 of the final report, we asked the Region to address in its 90-day response to the final report the issues we identified. Because the 90-day response and the attached technical review do not address all substantial issues we identified, we need to discuss this issue with Region officials and the technical reviewer.</p>
4. Other Issues-Monitoring	<p>Mr. Opalaski is correct in his memorandum of June 17, 2009 that OIG staff held a discussion with his staff about how monitoring might be an appropriate strategy to address the final report's recommendation. This discussion was part of a teleconference held on June 3, 2009, prior to the release of the final report. The first technical reviewer, who had concentrated on geochemical issues, had recommended that monitoring be enhanced to include monitoring within the repository materials. We acknowledged that this enhanced monitoring could result in collection of data on the actual behavior of moisture within the repository. Under an adaptive management approach—where appropriate actions are taken if collected data show that moisture levels within the repository that result from floods are adversely different from those estimated—enhanced post-construction monitoring might be a suitable substitute for continuing to reduce uncertainties in the pre-construction calculations and models.</p> <p>The Region has not submitted to the OIG plans to enhance the long-term monitoring for the repository. As a consequence, we can not evaluate whether the Region has followed up on the geochemist's recommendation to include monitoring within the repository, not just in the wells already in place around the repository. We need to discuss this issue with Region officials.</p>