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**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

November 14, 2002

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Mr. Mat Johansen, Groundwater Program  
Compliance Manager  
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**RE: INTERMEDIATE DEPTH PERCHED GROUNDWATER IN REGIONAL  
CHARACTERIZATION WELL, R-32  
LOS ALAMOS NATIONAL LABORATORY  
EPA ID: NM0890010515**

Dear Dr. Browne and Mr. Johansen:

The New Mexico Environment Department (NMED) recently received a copy of the handouts from the Los Alamos National Laboratory (LANL) Hydrogeologic Characterization Program Quarterly Meeting that was held on October 30, 2002. NMED has some questions regarding the presence of perched intermediate groundwater in regional characterization well, R-32. It was our understanding, based on the weekly drilling updates and other emails that were submitted to NMED by LANL, that alluvial groundwater was encountered at 18 feet below the ground surface in R-32, and intermediate perched groundwater was not detected during drilling. According to the well log and notes in the Quarterly Meeting handout, a Combinable Magnetic Resonance (CMR) geophysical log was run in the open hole from 53 feet to 808 feet. The CMR log indicates nine "zones of abundant free water": from 277 to 287 feet, 362 to 367 feet, 404 to 416 feet, 450 to 485 feet, 724 to 752 feet, 755 to 758 feet, 764 to 767 feet, 775 to 780 feet, and 788 to 800 feet. Additionally, the meaning and significance of the log's indication of two groundwater potentiometric surface levels, at 715 feet and 856 feet, is unclear. NMED was not informed of the presence of intermediate perched groundwater after it was detected, nor during



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the well installation process. We would like to emphasize the importance of communication between LANL and NMED. Any occurrence of groundwater is extremely relevant and important to NMED, particularly in a situation such as that in R-32 where numerous zones of groundwater were detected. Although LANL has improved its communication with NMED in recent months, more improvement is required. This is an example of the type of problem NMED wishes to eliminate, because it may impact future drilling and well installation needs.

The Data Quality Objectives (DQOs) for R-32 are summarized in the Technical Area (TA)-54 Groundwater Sampling and Analysis Plan (SAP) (LA-UR-02-0334). As listed in the SAP, one of the "Primary Purposes" of R-32 is to determine whether perched groundwater is present beneath Pajarito Canyon. The "Hydrology Issues" objectives include determining if infiltration from Pajarito Canyon and its associated wetlands leads to the development of intermediate depth perched zones of groundwater saturation. In addition, the location of R-32 (and other wells) relative to TA-54, coupled with known contaminant releases upgradient of R-32, makes it clear that determining the presence of perched intermediate groundwater is essential for accomplishing the hydrogeologic characterization goals established for this well. The objectives for vadose zone sampling include collecting water samples if perched groundwater is encountered during drilling. NMED realizes that LANL did not detect perched groundwater during the drilling of R-32, possibly due to the use of drilling mud; consequently, LANL could not sample the groundwater at that time. However, depending on the volume of water that flowed into the borehole during the delay in drilling to conduct geophysical logging, LANL may have been able to collect a screening sample from the intermediate groundwater bearing zones before the resumption of drilling. The final design of the well may have been impacted as the need to monitor some, if not all, of these zones should have been identified and discussed with NMED. In order for LANL to meet its DQOs and to obtain pertinent information on intermediate perched groundwater beneath Pajarito Canyon, NMED is requiring that LANL prepare a plan for installing additional wells in the area adjacent to R-32 to investigate intermediate groundwater. The required wells adjacent to R-32 shall provide, at a minimum, monitoring of the first perched groundwater interval and the thickest zones of perched groundwater, at 277 feet, 450 feet and 724 feet, as identified in the R-32 well log. NMED suggests that LANL drill the holes "dry" or with a method that will enable them to detect groundwater when it is encountered.

If you have any questions regarding these comments, please contact Ms. Carolyn Cooper of my staff at (505) 428-2539.

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Sincerely,



John Young  
LANL Corrective Action Project Leader  
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File: Reading and LANL HSWA TA-54 (HWP, Pajarito Canyon)