INITIAL TEST WELL CONDITIONING AT NOPAL I URANIUM DEPOSIT, SIERRA
PEÑA BLANCA, CHIHUAHUA, MEXICO

R. D. Oliver (LANL), J. C. Dinsmoor (LANL), S. J. Goldstein (LANL), I. Reyes (UACH),
and R. de la Garza (UACH)

Three test wells, PB-1, PB-2, and PB-3, were drilled at the Nopal I uranium deposit as part of a natural analogue study to evaluate radionuclide transport processes during March-April 2003. The initial pumping to condition the wells was completed during December 2003. The PB-1 well, drilled immediately adjacent to the Nopal I ore body, was continuously cored to a depth of 250 m, terminating 20 m below the top of the measured water level. The PB-2 and PB-3 wells, which were drilled on opposite sides of PB-1 at a radial distance of approximately 40 to 50 m outside of the remaining projected ore body, were also drilled to about 20 m below the top of the measured water level. Each test well was completed with 4-inch (10.2-cm) diameter PVC casing with a slotted liner below the water table. Initial conditioning of all three wells using a submersible pump at low pump rates [less than 1 gallon (3.8 l) per minute] resulted in measurable draw down and recoveries. The greatest drawdown (~ 15 m) was observed in PB-2, whereas only minor (<1 m) drawdown occurred in PB-3. For PB-1 and PB-2, the water turbidity decreased as the wells were pumped and the pH values decreased, indicating that the contamination from the drilling fluid was reduced as the wells were conditioned. Test wells PB-1 and PB-2 showed increased inflow after several borehole volumes of fluid were removed, but their inflow rates remained less than the pumping rate. Test well PB-3 showed the smallest drawdown and least change in pH and conductivity during initial pumping and quickest recovery with a rise in measured water level after conditioning. The 195 gallons (750 l) of water pumped from PB-3 during conditioning was discharged through a household sponge. That sponge showed measurable gamma radiation, which decayed to background values in less than 12 hours. Preliminary interpretations include filtration of a radioisotope source with a short half-life or of a radioisotope that volatilized as the sponge dried, such as Rn-222 and its short-lived daughters. No filtration was used during the pumping of PB-1 or PB-2.