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STRATIGRAPHY OF THE PB-1 WELL, NOPAL I URANIUM DEPOSIT, SIERRA
PEÑA BLANCA, CHIHUAHUA, MEXICO

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Three wells, PB-1, PB-2, and PB-3, were drilled in 2003 at the Nopal I uranium deposit as part of a natural analogue study to evaluate radionuclide transport processes. The wells penetrate through the Tertiary volcanic section down to the Cretaceous limestone basement, and intersect the top of the regional aquifer system. The PB-1 well, drilled immediately adjacent to the Nopal I ore body, was cored to a depth of 250 m, thus providing an opportunity to document the local stratigraphy. The uppermost unit encountered in the PB-1 well is the Nopal Formation, a densely welded, crystal-rich rhyolitic ash-flow tuff. The cored section is highly altered and devitrified, with kaolinite, quartz, chlorite, and montmorillonite replacing feldspars and much of the groundmass. Breccia zones within the tuff contain fracture fillings of hematite, limonite, and goethite. A zone of intense clay alteration encountered in the depth interval 17.45–22.30 m was interpreted to represent the basal vitrophyre of this unit. Underlying the basal vitrophyre is the Coloradas Formation, which consists of a welded, lithic-rich rhyolitic ash-flow tuff. The cored section of this unit has undergone devitrification and oxidation, and has a similar alteration mineralogy to that observed in the Nopal tuff. The Nopal I ore body is restricted to a brecciated zone that intersects these two volcanic units. A sharp contact between the Coloradas tuff and the underlying Pozos Formation was observed at a depth of 136.38 m. The Pozos Formation in the PB-1 core consists of interbedded, poorly sorted sandstone and conglomerate layers. The conglomeratic clasts consist of subangular to subrounded fragments of volcanic rocks, limestone, and chert. Thin (2–6 m) intervals of intercalated pumiceous tuffs were observed within this unit. The contact between the Pozos Formation and the underlying Cretaceous limestone basement was observed at a depth of 244.4 m.