

3/13/98

R-12 Activities for the Week of Mar. 9 - Mar. 13

Background

This weekly report describes the drilling, construction, completion, and testing activities for characterization borehole R-12 in Sandia Canyon.

R-12, which is the second of the regional aquifer wells installed under the Hydrogeologic Workplan, is located at the eastern boundary of the Laboratory, west of State Road 4 and north of East Jemez Road. The planned depth for this borehole is nominally 1000 ft, but the actual total depth may be adjusted as the investigation progresses to ensure that the characterization objectives are adequately addressed.

R-12 is an early warning well for potential contaminants moving towards water-supply well PM-1. It is designed to provide water-quality and water-level data for potential intermediate-depth perched zones and for the regional aquifer downgradient of numerous mesa top and canyon floor contaminant source areas in upper Los Alamos, Sandia, and Mortandad Canyons. Collectively, these source areas are referred to as Aggregates 1 and 7 in the Hydrogeologic Workplan. Completion of this well in the regional aquifer and collection of water quality and water level data intermediate-depth perched zones and the top of the regional aquifer are the primary goals of this borehole.

R-12 is also designed to collect hydrologic and geologic data that contribute to the understanding of the vadose zone and regional aquifer in this part of the Laboratory. The investigation will characterize both the unsaturated and saturated portions of the vadose zone as well as hydraulic properties at the top of the regional aquifer. The data collected will include key parameters for numerical flow and transport models and for geochemical models. The hydrologic and geologic data also will be used in conjunction with data from other planned characterization boreholes as well as from other data sources to evaluate and update the site-wide conceptual model.

Hydrologic and geochemical data from R-12 will support a completion strategy for borehole R-9, located 1 km to the south in Los Alamos Canyon. R-9 is temporarily "parked" with the present casing strings left in place and a temporary well installed. The presence of multiple saturated zones at the top of the regional aquifer with different pressure heads has complicated the final completion design for R-9, and well completion is being delayed until late spring or summer so that the R-12 investigation can better constrain the hydrogeologic conditions at the top of the regional aquifer in this part of the Laboratory.

The results and interpretations in these weekly reports are preliminary and will be updated as additional information is developed for this borehole.



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Summary of Weekly Progress

The major activities performed during the week of 3/9 to 3/13 are described below:

- The T-4 drill rig (Tonto Drilling Services, Inc.) was mobilized to the site along with other drilling equipment, materials, and supplies. Electrical power was installed from nearby power lines.
- Drilling of R-12 was initiated. A 22-in OD bucket auger was used to drill to a depth of 20 ft for installation of a 16-in surface casing. The casing was installed and cemented in place.
- The jack cellar was excavated and a reinforced concrete pad was poured in the bottom of the cellar. The 16-in surface casing was cut off at the base of the cellar and a pack-off was installed at the top of the casing.
- The backfill around the jack cellar vault was compacted, the casing jacks were installed, and the drill rig was realigned on the borehole in preparation for beginning drilling with a 14-in casing from 20 ft (inside the 16-in surface casing).
- The 14-in casing was advanced from the bottom of the 16-in surface casing (20ft) to a depth of 60 ft.

Schedule of Planned Activities

Next week, the 14 in casing will be advanced to the base of the Bandelier Tuff at ~130 ft depth. A downhole percussion hammer will be used to advance the hole in the underlying Cerros del Rio basalt to about 430 ft to create an open borehole for geophysics. Coring operations will begin at about 430 ft depth and will continue until the upper perched groundwater zone in R-12 (estimated at about 450 ft depth) is penetrated.