

Bell Canyon water levels were measured in the tubing for the next three years, and showed a stabilized level approximately 308 ft bgs (Saulnier et al., 1987).

In September 1986, Sandia removed the PIP and tubing from the well and set a 7.375-inch bridge plug in place of the PIP from 4027 to 4032 ft bgs to isolate the Bell Canyon from the rest of the well (Stensrud et al., 1987). A 10.5-inch bridge plug was set in the well casing from approximately 585 to 588 ft bgs and the casing was perforated across the Culebra interval from 503 to 529 ft bgs. This configuration allowed testing and monitoring of the Culebra with the rest of the well isolated.

Between March and April 1990, the bridge plug in the casing apparently failed, as indicated by anomalous Culebra water-level measurements. An attempt was made to retrieve the bridge plug in August 1994, but it had fallen into the hole below the casing and could not be reached with the equipment then available. On September 1, 1994, a replacement 10.375-inch bridge plug was set in the casing from approximately 605 to 609 ft bgs.

From August 17-20, 1999, Cabin Baby-1 was recompleted so that both Bell Canyon and Culebra water levels could be monitored. Davis Tool Company provided the reverse unit, mud pit, miscellaneous tools, and technical expertise for the recompletion. Tyler Well Service provided the pulling unit used, and Baker Oil Tools provided the packers. The recompletion activities are described below.

Cabin Baby-1 Recompletion

On August 17, 1999, the bridge plug set at 605 ft in the Cabin Baby-1 casing was deflated and removed from the well. As part of the deflation procedure, 2.375-inch tubing was attached to the bridge plug and opened to the interval below (the Salado and Castile). When this occurred, water was discharged from the tubing due to the high pressure from the Salado and Castile that had been contained below the bridge plug. (Note that this high pressure would not have been present had the Salado and Castile been in hydraulic communication with the Bell Canyon, which is much more permeable and has a much lower pressure.) A valve was quickly closed to stop the flow of water, and then the valve was opened slightly to allow the pressure to bleed off slowly. The bridge plug was then retrieved without incident.

We then went into the hole to find the bridge plug that had been set in the casing in 1986 and failed in 1990. We tagged something solid at 731 ft bgs, but it did not appear to be the bridge plug as we were unable to latch onto it. On August 18, 1999, we went into the hole with a bit to clean out any rock that might have sloughed onto the bridge plug. We drilled three feet before the bit stopped on something hard and we began to get metal shavings in the circulation fluid. Circulation was performed using saturated brine, a reverse unit, and a steel "pit." We tried again to retrieve the bridge plug, but were unable to latch onto it. We then went in with a washover shoe to clean out any rock that may have settled around the mandril and nipple above the bridge plug. We washed out a lot of halite chips and crystals, as well as brown and red clastic material that looked like it came from the unnamed lower member of the Rustler. We then went in again and successfully retrieved the bridge plug.