

Woodward-Clyde 
Engineering & sciences applied to the earth & its environment

December 21, 1994
C3M11QQ



U.S. Department of the Army
Corps of Engineers, Omaha District
ATTN: CEMRO-ED-EC (Mr. Tom Thiele)
215 North 17th Street
Omaha, Nebraska 68102-4978

Re: Landfills 3 & 4 Monitoring Wells
Cannon AFB, New Mexico

Dear Mr. Thiele:

The following information provides a brief history of and current projections for completing the work associated with Landfills 3 and 4 at Cannon AFB, New Mexico. As you are aware, we have encountered several problems with installing the deep monitoring well at Landfill 4.

In late October 1994, Woodward-Clyde (W-C) mobilized to Cannon AFB to install two deep (approximately 300 feet bgs) monitoring wells, one each downgradient of Landfills 3 and 4. After completing the installation of the monitoring well at Landfill 4 (MW-N), W-C began well development using a submersible pump. Approximately 50 gallons of water, which demonstrated rapid clearing, was pumped. When attempting to pull the pump up to completely develop the 30-foot screened interval, it apparently snagged a few feet above the base of the well, where we originally began development. During attempts to free the pump, we were able to push the pump down 3-4 feet, but were unable to pull upward past this position. We then spent several days with our drilling subcontractor trying to dislodge and retrieve the pump. However, we were unsuccessful, and after 17 consecutive days in the field (seven more than we planned), the field crew was sent home. The monitoring well at Landfill 3 (MW-O) was installed and developed without any problems.

We mobilized again to Cannon AFB on November 29th to complete the well installation at Landfill 4 and to complete the Phase II RFI for the Appendix II and III SWMUs. We made another unsuccessful attempt to dislodge the pump stuck in the well. On November 30th, we decided to abandon this well and install a new one. We assumed that the pump was lodged on a damaged screen section or joint. At this time the pump could not be moved either up or down, and it appeared as if sand had flowed in through damaged screen. With concurrence

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from the USACE, Cannon AFB, and NMED, the well was abandoned by pouring in a bucket of bentonite pellets, hydrating the bentonite, and then grouting the remainder of the casing to the surface. A concrete pad was poured at the surface after removing the protective well casing.

A second attempt for installing the deep monitoring well at Landfill 4 was then started. The borehole was drilled and the well constructed without any problems. However, problems were encountered during the grouting of the well. As some concerns had been expressed about the ability of the specified Schedule 80 PVC casing to withstand the heat of hydration and weight of the entire 270-foot grout column (possibly warping or collapsing the PVC, thereby rendering the well unusable), W-C had determined earlier to install the grout in a minimum of two lifts, 24 hours apart. With the dual wall percussion hammer method of drilling, the inner pipe is filled with grout, then retracted from the boring. As the outer casing is removed, the grout falls into and fills the borehole. At the completion of placing an interim lift of grout, the pipe and bit must be slightly above the upper surface of the grout to allow continued retraction of the drill pipe. The first lift of grout was placed in the borehole and allowed to cure overnight. When the crew returned the next day to finish the installation, the outer casing or drill pipe could not be pulled up. The drilling subcontractor had misjudged the height of grout within the outer casing, which then set up within the pipe, effectively grouting it in. While attempting to remove the outer casing, the well was damaged beyond repair. This well was subsequently abandoned.

A third and final attempt was then started on December 10th. W-C and the drilling subcontractor sent additional personnel to the site to oversee well construction. The well was installed and developed without any further problems. The well was completed on December 14th.

The work plan requires that wells not be sampled for a minimum of two weeks after development. With the upcoming holidays, W-C will be sending a crew to Cannon AFB on January 8th to sample and slug test the monitoring wells at Landfills 3 and 4. Laboratory analytical results take approximately 30 days. After receiving the results, W-C will validate the analytical data and generate an internal predraft report for review. After this review, it is expected that a draft report will be submitted on or about March 31, 1995, to EPA Region VI.

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Please call if you have any questions.

Sincerely,



Steve Cox
Project Manager

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