



State of New Mexico
ENVIRONMENT DEPARTMENT
DOE OVERSIGHT BUREAU
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 GOVERNOR

March 17, 1999

Joe Vozella, LAAO
 AIP Point of Contact
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 Los Alamos Area Office
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DOE OVERSIGHT BUREAU



RE: Completion of LANL's Task/Site Work Plan for Operable Unit 1049 Los Alamos Canyon and Pueblo Canyon

Dear Mr. Vozella:

The DOE Oversight Bureau (DOE OB) has evaluated the status of the referenced work plan, specifically the implementation of the ground-water characterization portion. We conclude that some sections of the characterization plan have been adequately completed. However, some of the activities listed in section 7.3 of the work plan are not presently being implemented: 1) the installation of the remaining nine alluvial piezometer wells and eight intermediate wells, 2) the sampling and analysis activities to be performed when all data-acquisition points (wells, etc.) are completed; and 3) hydrochemical and physical characterization of surface waters and its relationship to ground-water flow and contaminant transport. The following comments are offered in the spirit of technical support and may not reflect the regulatory position of NMED.

1) Los Alamos and Pueblo Canyon Piezometer/Alluvial Wells

The remaining nine piezometers may not be needed. However, installation of monitoring/piezometer wells and/or exploratory boreholes may be needed at other locations:

- a) Two alluvial monitor wells or piezometer wells located between LAO-1.8 and LAO-1.6(g) are needed to determine if the alluvial aquifer in upper Los Alamos Canyon seasonally divides into two distinct aquifers as suggested by OB. If division does occur then it would be extremely valuable to know this, especially in terms of assessing infiltration, seepage, contaminant transport, etc. These wells would also supply much needed aerial coverage near LAO-1.8.
- b) Several exploratory boreholes in upper Pueblo Canyon should be installed to determine the eastern extent of alluvial saturation. These would be quick borings with no logging and may be subsequently equipped with peizometers.
- c) Underflow in DP Canyon near its confluence with Los Alamos Canyon should be assessed. Ground-water contributions (via underflow) to the Los Alamos Canyon alluvial aquifer near LAO-2 may be occurring due to recharge from DP Spring. Several hand-augered wells across

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the channel should suffice in assessing this possible condition.

2) Los Alamos and Pueblo Canyon Intermediate Wells

The current LANL approach regarding the need for intermediate wells appears to rely heavily on the Hydrogeologic Work Plan schedule. The schedule and order in which the regional aquifer characterization wells are installed are not consistent with the schedule of the LA/Pueblo Canyon work plan. We suggest that drilling of intermediate wells be scheduled independently from the drilling of the regional aquifer wells so that the LA/Pueblo Canyon RFI Report may be submitted and used as a guide for the remaining canyon characterizations. LANL has completed one of the nine planned intermediate wells. The following suggestions are provided specific to the remaining eight wells:

- All designated intermediate wells should be completed in the uppermost intermediate water-bearing zone in order to better assess and monitor contaminant migration;
- As listed in Table 7-20 of the work plan, hydrogeologic data should be obtained at each well;
- A well should be installed east of the Rendija Canyon and Guaje Mountain fault systems in Pueblo Canyon so that information on contaminant migration as affected by the faults and hydrologic conditions east of the faults can be better defined;
- Maximum target depth should be determined prior to drilling. Where appropriate, if no water is encountered at that point, surface casing should be set for future regional aquifer drilling;
- During the drilling of R-9, the perched zones 180 ft and 275 ft were encountered, and apparently each show elevated levels of tritium, chloride, nitrate, and uranium. Therefore, LANL's well LAOI-7 should be completed in each of these zones so that proper characterization can be fulfilled.
- In order to characterize and potentially monitor intermediate aquifers, R-12 should be completed with a multi-zonal sampling system such as the system used for R-25.

Historical liquid releases to both Los Alamos and Pueblo Canyons are numerous. They ranged from septic-tank outfalls to large-volume untreated radionuclide effluent. For example, data collected in 1967 at DPS-1, located just downstream of TA-21's industrial outfall, showed levels of nitrate as nitrate and ^{90}Sr at 104 mg/L and 28,600 pCi/L respectively (Purtymun, 1975). Present-day releases include the re-mobilization of soluble radionuclides such as ^{90}Sr that enter the ground-water system(s) via the infiltration of storm-water and snowmelt runoff. Concentrations (e.g., 142.1 pCi/L at DPS-1 in DP Canyon) (LANL, 1997) at times greatly exceed EPA's drinking water standard of 8 pCi/L. An abundance of data exist which show that intermediate ground water at POI-4, TW-1A, TW-2A, LADP-3, R-9 and R-12 has been impacted by these releases. Therefore, the characteristics such as rates of transport, contaminant distribution, etc. and the fate of these historical and present-day contaminants needs to be determined, especially within the shallow perched systems (alluvial and intermediate depth aquifers). It should also be noted that current and future fate/transport and ground-water flow modeling by LANL would suffer if this portion of the characterization process were not performed.

3) Sampling and Analysis Plan (alluvial, intermediate systems and surface-water flow regimes)

- A detailed sampling and analysis plan (SAP) should be developed (with NMED input) in addition to the general strategy presented in the work plan. This should be completed as soon as all the data-acquisition points are in place so that the hydrologic investigation is better defined.
- DP Canyon should be included in the above mentioned SAP. Field activities should include the collection of hydrochemical and hydrologic/hydrogeologic data for Los Alamos, Pueblo and DP Canyons.
- Pressure transducers should be placed in all ER alluvial and intermediate wells including wells LAUZ-1 and LAUZ-2. Since no ER wells exist in Los Alamos Canyon from LAO-1.6(g) to State Route 4, we suggest that the ESH-18 wells LAO-2, LAO-3A, LAO-4 LAO-4.5C and LAO-6 be equipped with transducers, if they are not already. The use of in-situ water-quality probes may be warranted in a select number of wells.
- Field-measured water levels should be collected in all wells including those not being sampled (LAO-1, APCO-1, NM State Highway Department wells at Totovi, etc.).
- Hydrochemical data should be collected on a representative number of wells, including those in DP Canyon. These data should be collected within the same time period so that the temporal and spatial distribution of contaminants is better understood.
- The following springs should be sampled in conjunction with the well sampling (i.e. within one week): Skate Rink, DP, LA-4.5 (if flowing), Basalt, Los Alamos, Indian (needs to be excavated or uncovered), Sacred and Otowi.
- Sampling should be performed on a quarterly basis as specified in the work plan. LANL should also sample a select number of wells after a single storm event; this would help to characterize the influence that storm water has on ground-water quality.
- Surface-water samples should be collected during snowmelt and storm-runoff events. Six or seven sampling stations within the Los Alamos, DP and Pueblo basins should suffice.

These recommendations are intended to aid in the completion of the outstanding deliverables specified in the Los Alamos and Pueblo Canyon Work Plan. Knowledge gained by the completion of the work plan can be carried over to other canyon characterization activities and help ensure that future work plans are implemented in a more logical and cost effective manner.

Please contact Chris Hanlon-Meyer at 827-1536 or Michael Dale at 672-0449 if you have any questions concerning these recommendations.

Sincerely,



Steve Janicak, LANL POC
Department of Energy Oversight Bureau

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References:

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