General

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20 November 2005

Mr. James Bearzi
NMED Hazardous Waste Bureau
2905 Rodeo Park Dr., East Bldg. 1
Santa Fe, NM 87505

Via Email with Attachments
and Via U. S. Mail

Re: Comments by J. D. Campbell, JDC Consultants, Inc.
On LANL Interim Facility-Wide Groundwater Monitoring Plan
Dated May 2005

Dear James,

In response to your suggestion, I have provided my review comments on the subject plan based on my past experience and expertise and my knowledge of LANL site conditions. The comments attached to this letter are provided to NMED at no cost and are for the NMED's use as they consider appropriate.

A major comment that I have is for NMED to require a new set of Data Quality Objectives (DQOs) be established for this interim groundwater monitoring program at LANL. Past investigations to characterize the hydrogeologic setting had different DQOs than are required for monitoring of contaminant migration at LANL. The technical studies underway by LANL with the assistance of USEPA and others will assist LANL to establish an appropriate set of DQOs for constituent monitoring to be approved by NMED. Ensuring data meet the new DQOs will be the only way to make reliable decisions on remediation alternatives and the effectiveness of remedial actions.

I did not take the time nor do I have current knowledge or the required information to comment on all of the specific monitoring locations listed in the Interim Plan. I have made recommendations shown in bold print on the attached set of comments for changes to the Interim Plan and for NMED to consider additional new monitoring wells.

I am pleased to provide these comments to NMED for your consideration. Please contact me if you wish to discuss any of these comments or other issues.

Very truly yours,

J. D. Campbell, Ph.D., P. E.
President

Attachment: Comments on Interim Facility-Wide Groundwater Monitoring Plan
Cc: Cindy Padilla (via email with Attachment)

13967

Comments by J. D. Campbell, JDC Consultants, Inc.
Submitted to NMED 20 November 2005
On
Interim Facility-Wide Groundwater Monitoring Plan
Los Alamos National Laboratory
LA-UR-05-3443 ER2005-0204
May 2005

The following comments are provided by J. D. Campbell, Ph.D., P. E., in his capacity as a consulting engineer with JDC Consultants, Inc, P. O. Box 1770, El Prado, NM 87529. These comments are based on Campbell's review of the Interim Facility-Wide Groundwater Monitoring Plan (Interim Plan) for Los Alamos National Laboratory (LANL) dated May 2005. These comments are provided to the New Mexico Environment Department (NMED) on 20 November 2005 at no cost to the NMED and for the NMED's use as they consider appropriate.

1) Studies over the past year or so have raised questions about the ability of existing groundwater monitoring wells and specific screened zones within the wells at LANL to produce samples of groundwater which are representative of ambient conditions in the aquifer adjacent to the well. Potential impacts to the aquifer from drilling methods used, drilling fluids used, development procedures, construction of screened zones, methods of groundwater sampling, and measurement of field parameters are being evaluated with respect to the ability to produce representative samples for detection of contamination and background chemistry. LANL and the USEPA have continued technical discussions together with other interested parties to develop a screening methodology for evaluating the potential for each individual monitoring well and screened zone at LANL to produce groundwater samples representative of the ambient conditions in the aquifer. Wells or screened zones that do not pass a conservative screening methodology will be flagged together with currently available analytical data obtained from these wells or screens. The flagged wells and screens will be further evaluated for remedial work that may permit the well or screen to produce representative groundwater samples. **Therefore, it is recommended that no monitoring wells or screened zones be considered for evaluation of contaminant migration (constituent monitoring) or ambient monitoring in this Interim Plan until an adequate evaluation, as approved by NMED, has been made by LANL and procedures are in place to ensure that each groundwater sample obtained in accordance with this Interim Plan is considered representative of the ambient conditions in the aquifer or water bearing zone.**
2) Measurement of groundwater head for development of piezometric surface and groundwater flow patterns or other physical parameters may not be impacted by the concerns expressed in Comment 1 above.

3) In Paragraph 1.5, Approach to Monitoring Network Design, the NMED Consent Order and the EPA "Guidance for Monitoring at Hazardous Waste Sites: Framework for Monitoring Plan Development and Implementation" require that a set of Data Quality Objectives (DQOs) be established (EPA Steps 1 through 4 of the Guidance) for the monitoring program. The DQOs for detection and monitoring of constituents affecting groundwater must provide for low level detection of trace constituents. Step 5 of the EPA Guidance requires a careful review of all data collected to ensure they meet all the requirements of the DQOs. The appropriate DQOs for this Interim Plan are different from some previous monitoring well installation programs at LANL including the recently completed Hydrogeologic Workplan (LANL 1996). To satisfy the appropriate Data Quality Objectives for the Interim Plan new or different monitoring wells, individual screens, well locations or screen sampling intervals may be required to produce representatives of groundwater at LANL. **A set of appropriate DQOs, to be approved by NMED, should be developed and summarized at the end of Paragraph 1.5 for this Interim Plan.**
4) **In Paragraph 1.7, Analytical Methods, Field Methods, and Data Review, a requirement should be added that the DQOs developed in Paragraph 1.5 should be reviewed prior to each sampling event to ensure that all analytical methods, field methods and data will meet the DQOs established for this Interim Plan.**
5) In Paragraph 1.8, Sampling Frequency and Schedule, the Interim Plan indicates that semiannual sampling is proposed for base flow, alluvial groundwater, intermediate perched and regional groundwater zones instead of quarterly sampling as required in the Consent Order. **To confirm the assertions made as a rational for only semiannual sampling, it is recommended that a select and statistically significant number of alluvial, intermediate and regional groundwater monitoring locations important for detection of contaminants from waste management units and capable of meeting all DQOs be sampled on a quarterly basis for at least one year prior to switching to semiannual monitoring.** This will provide more immediate data to confirm the variability of conditions in water bearing units and the potential migration of constituents.
6) In Appendix B, Section B-1.0, Data Review and Screening Process, **the DQOs should be referenced and used to screen the data in the process described in B-1.0 to ensure data meet all the requirements of the DQOs.** Data not meeting all the requirements of the DQOs should be qualified in a manner so their future use may consider the limitations inherent in the data.
7) In Appendix C, some of **the methods and procedures may need to be modified in the future based on analyses and recommendations that result from the ongoing technical studies that LANL is conducting with the assistance of the USEPA and others related to: drilling methods, drill fluids, well development, screen installation, well purging prior to sampling, and sampling methods, sample handling, and measurement of field parameters.**
8) This reviewer has neither the time nor background to review each of the proposed monitoring locations within the Interim Plan. Based on this reviewers limited

background, additional monitoring locations should be considered to investigate potential soil and groundwater contamination at areas including:

a. Groundwater and soil gas monitoring adjacent to MDA H in TA-54 should be added to the Interim Plan. Current groundwater monitoring appears to be well R-22 located some 2 miles to the east of MDA H. The pending Corrective Measures Study for MDA H indicates large quantities of explosives, plastics (solvents?) and significant quantities of tritium have been placed in shafts at MDA H. Neutron probe profiles of moisture content in the tuff indicate an increased moisture content in the tuff unit Qbt 1vc at a depth of 150 feet below ground surface (bgs). **A well screen at this intermediate depth (approx 150 feet bgs) would allow for soil gas and available water sampling. A well screen at the top of the regional aquifer would permit closer sampling of groundwater beneath MDA H.**

b. A truck wash station is reported to have been utilized near Pit 19 in MDA G also within TA-54. While there are indications of water lines to this area, there is no indication of sewer lines to service this area. If the truck wash liquids were allowed to enter the pits or infiltrate into the ground as storm water is apparently managed in the pits, there could be significant amounts of perched water in this area of the intermediate zone beneath the truck wash area. High levels of tritium are observed in soil gas in this area and to the east. **A well screen or two at intermediate depths to be determined by neutron log identification of high moisture contents in the subsurface, would allow for soil gas and available water sampling. A well screen at the top of the regional aquifer would allow for sampling of groundwater beneath MDA G.**

c. Impoundments at MDA L in TA-54 have no doubt allowed large quantities of liquids to infiltrate the subsurface tuff. **New monitoring wells may be located downgradient and within the potential infiltration mound of the former impoundments at MDA L. Intermediate well screens located by neutron log identification of high moisture content area together with a well screen at the top of the regional aquifer would allow for investigation of impacts to the ground and regional aquifer from these past disposal activities at MDA L.**

d. Reports of a former laundry operation in TA-21 with the potential for discharge of large amounts of water to the surface (if not discharged to a POTW?) might contribute to migration of contaminants from the MDAs in TA-21. Investigation is scheduled to begin soon on MDA B in TA-21. **If the former laundry facility discharged water to the surface, new monitoring wells in this area would be warranted to investigate contaminant migration.**