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# Los Alamos

NATIONAL LABORATORY

*Los Alamos National Laboratory  
Los Alamos, New Mexico 87545*

Date: December 24, 1997  
In Reply Refer To: ESH-18/WQ&H:97-0452  
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C-00-008*

8008 NW  
JAN 1998

Mr. H.R. Daneman  
1304 Calle Ramon  
Santa Fe, NM 87501

**SUBJECT: NOVEMBER 16, 1997, LETTER CONCERNING GROUNDWATER  
CONTAMINATION AT LOS ALAMOS NATIONAL  
LABORATORY**

Dear Mr. Daneman:

I have been asked to respond to your letter to Governor Gary Johnson regarding radioactive contamination of groundwater at the Los Alamos National Laboratory, specifically in Mortandad Canyon. You also expressed concerns about the public availability of Laboratory Environmental Surveillance data. I will begin by giving a brief history of radioactive effluent disposal in Mortandad Canyon and the contaminant levels in the canyon.

The primary Laboratory use of Mortandad Canyon has been for liquid waste disposal, approximately since the Laboratory began operations in 1943. Beginning in 1963 most of the liquid radioactive effluent from the Laboratory has been discharged into Mortandad Canyon. The canyon was selected for this activity following a detailed study by the U.S. Geological Survey which showed hydrologic characteristics of the canyon are favorable for on-site containment of the effluent and associated contaminants.

Radioactive liquid wastes from Laboratory operations have been collected and treated at the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50 using classical but effective chemical and physical treatment technology. The TA-50 RLWTF has operated continually with periodic upgrades being made to the treatment process. Major upgrades to meet new National Pollutant Discharge Elimination System (NPDES) requirements, New Mexico groundwater quality standards, and the Department of Energy derived concentration guides for radionuclides in water in uncontrolled areas are being implemented in 1997 and 1998. The discharge has been regulated by the Laboratory's NPDES Permit No. NM0028355 (NPDES outfall 051) since 1990 and typically contains low levels of radionuclides and other chemical constituents. The discharge flows a short distance downstream in Mortandad Canyon, infiltrates into the canyon bottom alluvium, sustaining a shallow body of perched groundwater in middle Mortandad Canyon.



The Laboratory has installed numerous wells in the canyon alluvium and the hydrogeologic unit immediately below and has routinely monitored the surface water, groundwater, and sediment in the canyon since 1961. Results from the testing have been publically available for more than 25 years through the Laboratory's annual Environmental Surveillance Report series. Evaluation of the monitoring data has shown that most of the radionuclides discharged are adsorbed to the sediments; to date the inventory of transuranic radionuclides (about 400 mCi) discharged to the canyon has been largely contained within Laboratory boundaries.

The shallow perched alluvial groundwater system is of limited saturated thickness, typically 10 to 20 feet, and does not extend beyond the Laboratory boundary. While the shallow groundwater is not used for drinking water supply or irrigation, for purposes of comparison the Laboratory considers these uses in evaluating the groundwater quality in Mortandad Canyon. The 1996 Los Alamos Environmental Surveillance report indicates that the levels of tritium, strontium-90, gross alpha, and gross beta exceed EPA drinking water criteria. Concentrations of nitrate and fluoride often approach or exceed the New Mexico Water Quality Control Commission groundwater standards. The levels of these contaminants observed in 1996 are within the ranges observed over the decades of testing. Analyses of the 1997 surveillance samples are not complete.

The ongoing upgrades to the TA-50 treatment plant are expected to dramatically reduce the levels of both radiological and nonradiological contaminants at the outfall and, in turn, in the groundwater. Installation of a reverse osmosis membrane filtration system will reduce the concentrations of virtually all the radionuclides, except tritium, as well as reduce the concentrations of nitrate and fluoride. The upgrades are the foundation through which the Laboratory will meet New Mexico Water Quality Control Commission groundwater standards in the shallow groundwater.

In the long term, the groundwater quality issue of most importance is the degree to which these liquid waste discharges will impact the regional aquifer system underlying the canyon. Monitoring of the regional aquifer to date indicates the presence of trace levels of tritium; levels are less than 1 percent of the EPA drinking water criteria. To further characterize the extent of contamination, extensive drilling and sampling of the subsurface will be performed in 1998 and 1999 by the Laboratory's Environmental Restoration Project. Copies of the Work Plan for Mortandad Canyon are available for your review at the Laboratory's Community Reading Room.

In your letter to Governor Johnson, you express concern regarding the speed at which the Laboratory's water quality surveillance data is made available to the NMED DOE Oversight Bureau and to the public. As discussed above, all of our surveillance data are publically available through the Environmental Surveillance Report. The report is typically available in October of the year after the data are collected. The report is also now available electronically on the world wide web, potentially increasing the ease of

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public reference. We are taking additional steps to make our data more available in the future.

Feel free to contact me at 667-3040 for information about the water quality surveillance program. Call Steve Rae at 665-1859 for information about water quality compliance issues. For information about the Environmental Restoration Project's characterization activities in Mortandad Canyon, please call Allyn Pratt at 667-4308.

Sincerely,



Bruce Gallaher  
Water Quality and Hydrology Group

BG/rj

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