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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

December 29, 2005

Mat Johansen
Groundwater Project Manager
NNSA -- Los Alamos Site Office
Mail Stop A316
Los Alamos, NM 87544

David McInroy
Remediation Services Deputy Project Director
Los Alamos National Laboratory
P.O. Box 1663, Mail Stop A100
Los Alamos, NM 87545

**RE: INTERIM MEASURES WORK PLAN REQUIREMENT
GROUNDWATER CONTAMINANTS DETECTED IN THE REGIONAL
AQUIFER AT R-28
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-GW-MISC**

Dear Messrs. Johansen and McInroy:

This letter constitutes a determination by the New Mexico Environment Department (NMED) under Section VII.B.1 of the March 1, 2005, Order on Consent (Order) that interim measures are necessary to reduce or prevent migration of contaminants which have or may result in an unacceptable human or environmental receptor exposure to contaminants while long-term corrective action remedies are evaluated and implemented. Pursuant to Section VII.B.2 of the Order, the U.S. Department of Energy and the University of California (collectively, the Respondents) shall submit to NMED for review and written approval and interim measures work plan within ninety (90) calendar days. The work plan shall be submitted in accordance with the format described in Section XI.B of the Order and shall include an implementation schedule, also subject to NMED review and approval.

NMED's determination is based on the Respondent's verbal notification on December 23, 2005, of chromium detections in regional aquifer well R-28. Specifically, the Respondents reported the results of sampling in May, September, and November of 2005 revealing chromium levels between 375 and 404 parts per billion (ppb), several factors above the New Mexico Water Quality Control Commission standard of 50 ppb and several times the Safe Drinking Water Act

Maximum Contaminant Level of 100 ppb. In the Respondent's verbal notification, NMED was informed that the May 2005 sampling event was the first for R-28. Since the notification, NMED has discovered that elevated chromium was first detected in a sample collected January 12, 2004, at 270 ppb. This result was included in the R-28 Completion Report, dated April 28, 2004. The 15-month sampling hiatus between January, 2004 and May, 2005 remains unexplained.

Nitrogen isotope data suggest that the regional aquifer samples collected from R-28 reflect a sewage component that may be associated with the observed chromium contamination. Carbon-14 data suggest the age of the vast majority of the water from R-28 is old (>5,000 years). Given the concentrations of chromium measured and the age of the water in R-28, it is likely that a fraction of highly contaminated young water is mixing with the regional aquifer groundwater, producing the results seen in R-28.

Many possible sources for the chromium exist; however, NMED offers one plausible source of the chromium contamination detected in R-28 and R-11. Historic (1950 to the mid 1970's) use of chromium in cooling towers located at TA-3 discharged to upper Sandia Canyon. While chromium is presumably no longer a constituent used in the cooling towers, the discharge continues to support a wetland and perennial surface water flow in Sandia Canyon. A 1987 Department of Energy document reports that on a daily basis, roughly 36 pounds of chromate-phosphate-zinc type corrosion inhibitors were discharged along with 128,000 to 288,000 gallons of water to upper Sandia Canyon. Hexavalent chromium was measured in the discharge up to 34 parts per million (ppm). Four miles downstream of the discharge, chromate levels averaged 10 to 15 ppm, chromium VI was estimated to be half those concentrations. In addition, chromium VI was detected in surface water approximately two miles down stream of the outfall. Discharge of effluent from historic sewage treatment plant operations to upper Sandia Canyon occurred and still occurs today (between 1997 and 2003, 260,000 gallons/day and 1.4 million gallons/day), providing a continual head for downward and down-gradient migration of contaminants.

The interim measures work plan (Plan) must present work that will aggressively characterize the nature and extent of contamination, and identify the source(s) of contamination. At a minimum, the Plan must include the following:

1. A detailed assessment of water levels, groundwater flow directions, and groundwater gradients during peak and non-peak pumping of the municipal supply wells influencing groundwater flow around R-28 and R-11. This assessment should consider wells not only in Mortandad and Sandia Canyons, but also in Los Alamos and Pajarito Canyons and their tributaries. This assessment must also consider historic groundwater gradients and pumping conditions as well as current conditions. Inclusion of detailed descriptions and illustrations depicting zones of saturation from the alluvium downward and recharge areas with respect to surface and subsurface geology is also required as part of the submittal.
2. A thorough assessment of all plausible current and historic sources in the vicinity of R-28 [e.g., Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility discharges

(since 1963), historic discharges into Ten Site Canyon, and sewage and cooling tower discharges from TA-3 into Sandia Canyon]. The assessment must also include discussions of geochemistry that may be useful in delineating a source. For example, discuss and provide information regarding the chemical additives used in cooling towers to prevent biologic fouling and scaling since discharges initiated, as well as any documentation concerning the amounts of additives used and the time and duration of the use of additives.

3. All data (e.g., geochemical and geophysics), well logs, field logs, etc. from the investigation activities associated with the proposed advanced hydrodynamic test facility located at TA-53 must be provided and summarized. Any other data relevant to the investigation of contamination in R-28 available must also be provided and discussed.
4. Plans to investigate the nature and extent and identification of the source or sources for the chromium detected in the regional aquifer at R-28 and other adjacent wells. NMED expects that the Plan will propose an aggressive well-drilling and sampling program that targets regional, intermediate, and alluvial groundwater zones.
5. Plans to investigate surface and alluvial water loss in Mortandad and Sandia canyons. In particular, the subsurface conditions leading to stream flow and alluvial groundwater loss in Sandia and Mortandad Canyons (less than 1 mile from R-28), and the fate of these waters, have yet to be assessed. The Respondents' Plan must propose field work directed toward answering these crucial questions.
6. Plans to monitor and sample surface water and groundwater that describes monitoring and sampling frequency, water level and sample collection methods, sample locations, field data acquisition, and laboratory analytical suites. All work must be conducted in accordance with the requirements of in the Order.

Until a groundwater sampling schedule is approved in the Interim Facility-Wide Ground Water Monitoring Plan, the Respondents shall sample the regional aquifer wells R-28, R-11, R-13, R-15, R-34, R-33, R-14, R-12, R-1, and TW-8 and all intermediate wells located within the Mortandad and Sandia Canyon watersheds. Subsequent sampling shall be conducted quarterly. The sample suite shall be for all contaminants as defined in the Order, including hexavalent chromium and the relevant radionuclide suite. Water level measurements must also be made concurrently with the required sampling event in the Mortandad, Sandia, Pajarito, and Los Alamos Canyon watersheds to provide a snapshot of the hydrogeologic system. The initial sampling must be conducted in time to report the results in the Interim Measures Work Plan within 90 days of the Respondents' receipt of this letter. The sampling and water level monitoring activities must be accomplished within a two week period of time.

Finally, NMED is concerned that close to two years have passed without any formal notification of the initial chromium detection in January, 2004. Over six months have passed since the most recent sampling confirmed the chromium concentrations above standards. Under Section V of the Order, the Respondents are required to notify NMED within fifteen (15) days after the

discovery of any previously unknown release of contaminants from a solid waste management unit or area of concern. Other reporting requirements exist under 20.6.2.1203 NMAC.

Should you have any questions or comments, please contact John Young of my staff at (505) 428-2538.

Sincerely,



James P. Bearzi
Chief
Hazardous Waste Bureau

JPB:jry

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