Environmental Restoration
University of California
Environmental Restoration Project, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

Date: December 10, 1997
Refer to: EM/ER:97-525

ENTERED

Dr. Robert Dinwiddie
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION FOR VCA COMPLETION REPORT FOR PRS 57-006 IN TA-57 (FORMER OU 1154)

Dear Dr. Dinwiddie:

Enclosed is the Los Alamos National Laboratory's response to the New Mexico Environment Department Hazardous and Radioactive Materials Bureau's request for supplemental information for the Voluntary Corrective Action Completion Report for Potential Release Site 57-006 in Technical Area 57.

If you have any questions, please contact Don Krier at (505) 665-7834 or Mike Gilgosch at (505) 667-5794.

Sincerely,

Julie A. Canepa, Program Manager
LANL/ER Project

Sincerely,

for Theodore J. Taylor, Program Manager
DOE/LAAO

JC/TT/rfr

Enclosure (1) Response to Request for Supplemental Information for VCA Completion Report for PRS 57-006 in TA-57 (Former OU 1154)

LANL
5 / 1154 / 57

3712

TC

Cy (w/enc.):
M. Gilgosch, LAAO, MS A316
D. Griswold, AL-ERD, MS A906
J. Harry, EES-5, MS M992
D. Krier, EES-1, MS D462
D. Neleigh, EPA, R.6, 6PD-N
C. Rodriguez, CIO/ER, MS M769
T. Taylor, LAAO, MS A316
J. White, ESH-19, MS K490
B. Garcia, NMED-HRMB
M. Leavitt, NMED-GWQB
J. Parker, NMED-HRMB
G. Saums, NMED-SWQB
S. Yanicak, NMED-AIP, MS J993
RPF, MS M707

Information Only (w/o enc.):
T. Baca, EM, MS J591
T. Glatzmaier, DDEES/ER, MS M992
T. Longo, DOE-HQ, EM-453
D. McInroy, EM/ER, MS M992
J. Plum, LAAO, MS A316
S. Rae, ESH-18, MS K497
G. Rael, AL-ERD, MS A906
J. Vozella, LAAO, MS A316
EM/ER File (CT# C399), MS M992
EM/ER File, MS M992

Response to
Request for Supplemental Information on
Voluntary Corrective Action Completion Report
for Potential Release Site 57-006

INTRODUCTION

To facilitate review of this response, the New Mexico Environmental Department's (NMED's) comments are included verbatim. The comments are divided into general and specific categories, as presented in the letter. Los Alamos National Laboratory's (LANL's) responses follow each NMED comment.

The NMED request concerns a voluntary corrective action (VCA) completion report that was prepared as a result of the removal and disposal of a 55-gallon drum from the site of the Fenton Hill Geothermal Energy Hot Dry Rock Project (former Operable Unit 1154).

GENERAL COMMENTS

NMED Comment

1. *LANL should provide the field screening and boring log notes, and the QA/QC information on the one analytical result presented.*

LANL Response

1. The VCA included the hand excavation of a 55-gallon metal drum and drum extension (called *the vessel* in the VCA completion report), which had received waste water from a trailer performing analytical chemistry determinations of waters associated with the Hot Dry Rock Project. The metal drum assembly, with its inner plastic liner, was removed from the ground in September 1994. There was no liquid within the plastic liner, but a layer of dried sludge covered the liner bottom to a thickness of between 0.5 to 1.0 inches. There was a small amount of liquid (approximately 6 inches in depth) between the liner and the outer metal drum; the liquid was believed to be precipitation that had collected in the drum. The drum assembly had been placed in a shallow excavation so that the top of the assembly was elevated above the ground surface, and there was exposed space between the drum and the drum extension that allowed rain or snow melt to enter the drum. The distance from the ground surface to the bottom of the hole that held the drum was approximately 3 feet. There is no boring log for this excavation work because hand digging into fill was used to free the drum before removal; however, field notes are attached (Attachment 1).

   Field screening instruments were used for health and safety purposes to indicate to workers whether there were any hazards encountered during the VCA. Beta-gamma readings were performed with a handheld ESP-1 instrument and pancake detector on the soils that were excavated around the tank. These readings indicated background levels of radioactivity. The h-nu instrument for volatile organic corripound (VOC) detection was also used for screening during excavation, and no VOCs were detected. The quality assurance/quality control (QC) information requested on the analytical results is attached (Attachment 2). A second soil sample (a replicate) was also collected from the location under the drum. This analytical information and QC results are also included in this package (Attachment 3).

TC

SPECIFIC COMMENTS

NMED Comment

1. *Page 1; 1st paragraph: LANL should include the depth at which the vessel was buried.*

LANL Response

1. The drum assembly was installed so that it stuck up above the ground surface. The bottom of the drum assembly was measured to be 3 feet from the surface of the ground. The drum stuck up above the ground surface by approximately 8 inches.

NMED Comment

2. *Page 1; Corrective Action: LANL should include the results of the analyses performed on the vessel's liquid. Since this unit contained waste that either has hazardous constituents or hazardous waste, this PRS will be added to the HSWA Module of the RCRA Operating Permit.*

LANL Response

2. Attached are analytical chemistry data for a non-Environmenta Restoration (ER) Project sample of the liquid from the plastic liner taken in 1993 before the drum was emptied. These results (for total metals) indicated elevated concentrations of barium (35 mg/L), lead (1 mg/L), and mercury (0.14 mg/L). The VOC compound, 1,2-Dichlorotrifluoroethane, was found in the liquid sample at the concentration of 5.5 mg/L. No target semivolatile organic compound was detected in the liquid sample. The pH of the liquid was measured in 1993 and found to be between 6 and 7.

   Because the waste water disposal drum has been excavated, the site has been reclaimed, and only slightly contaminated soil remains at a depth of 3 feet below the ground surface (see LANL Response 3), LANL does not see the efficacy of adding this potential release site (PRS) to the Hazardous and Solid Waste Amendments (HSWA) Module of the Resource Conservation and Recovery Act (RCRA) operating permit.

NMED Comment

3. *Page 5; Table 1:*
   a. *The table mentions that the depth of the one confirmatory sample was 0 to 6 inches. LANL should clarify whether the depth is 0 to 6 inches below the bottom of the vessel or the ground surface.*

LANL Response

3. The confirmatory sample was taken in the first 6 inches of soil found directly under where the bottom of the drum was situated when it was still in the ground (LA-UR-96-1062).

NMED Comment

4. *Page 5; Table 1:*
   b. *LANL should further investigate the vertical extent of lead contamination since the lead result of 90 mg/kg is approximately 3 times the UTL.*

LANL Response

4. LANL asserts that the physical and chemical environment attendant to the subsurface soil lead contamination renders the determination of *extent* to be unnecessary in this case.

   LANL submits that any elevated level of lead found in soil below the drum is due to small inadvertent releases of waste liquids that occurred when the drum was being emptied during the time the site was in active operation. The top of the drum extended above the ground surface, and snow and other precipitation could percolate around the edge of the drum and carry surface contaminants to the drum bottom/ground interface. For this reason, the soil samples collected immediately below the drum bottom should contain the highest concentration of lead found in soils associated with the drum. When the drum was removed during the VCA, it was examined. Although a significant amount of rust was observed on the outside of the drum, there was no evidence of holes in the drum. Although the concentration of lead (90 mg/kg and 187 mg/kg) in the soil immediately under the drum was greater than the upper tolerance level (UTL) for lead in soil (23 mg/kg), it was less than the concentration for lead in soil that is typically acceptable at Superfund sites in clean up of lead-contaminated soils (500 to1000 mg/kg) Also, this chemical drum had built-in leak protection in the form of a plastic liner to contain potentially corrosive liquids being disposed into the drum. As stated above, examination of the outside of the steel drum indicated that the integrity of the drum had been maintained. There is no evidence that leakage of the drum caused the elevated levels of lead in soils found directly below the drum.

   It is known (Lange's "Handbook of Chemistry," Ninth Edition, and James Drever's "The Geochemistry of Natural Waters," Second Edition, 1988) that lead forms very insoluble precipitates when interacting with both carbonates and oxides/hydroxides. Contaminant lead in soil would be precluded from migrating any significant distance from the location of the confirmatory sample
   - by adsorbing onto the surface of soils (or the tuff which lay within several feet of the ground surface),
   - by being precipitated out when encountering interstitial soil moisture that contains small concentrations of bicarbonate-carbonate, or
   - by forming insoluble oxides/hydroxides because of hydrolysis when encountering soil moisture.

   Another mechanism for retarding the migration of lead or other trace metals would be coprecipitation of these metals by iron and manganese oxides. The slight rusting of the bottom of the drum would have increased the natural concentrations of these oxides that are ubiquitous on soils. Hydrous manganese and iron oxides have extremely high adsorption capacities and high adsorption affinities for trace metals (James Drever's "The Geochemistry of Natural Waters," Second Edition, 1988).

   Finally, in the RCRA facility investigation report for this PRS (LA-UR-96-1062), Table A-1 (Attachment 4) indicates the adsorptive capability for lead of the Fenton Hill soils and tuff. At

site 57-2000, a location where a circulation water setting pond had been sited, a drilling core sediment sample taken at 5.25 to 6.0 feet had a lead concentration of 161 mg/kg. In the tuff sample from the next interval (6.0 to 7.0 feet), the soil lead concentration had decreased to 8.4 mg/kg. This sample was taken only 200 feet from the location where the chemical tank sample was collected in similar sediment and tuff environments.

LANL submits that this PRS does not pose any threat to human health or the environment, and it would not be beneficial to perform additional investigations to determine extent because

- the location of the elevated levels of lead in soil is now 3 feet below ground surface,
- soil lead concentrations are significantly lower than required regulatory soil cleanup levels for lead,
- the contaminants are located in material that is known to readily adsorb lead, and
- the contaminants are missing a driving force (constant source of acidic water) that could free the lead from the soil and move it vertically 450 feet to an underlying perched aquifer or 1750 feet to the regional aquifer,