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Environmental Restoration

A Department of Energy environmental clean-up program

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LARS F. SOHOLT

REPORT OF RESULTS FROM VERIFICATION SAMPLING AT OLD CENTRAL SCHOOL SITE

Los Alamos National Laboratory

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**REPORT OF RESULTS
FROM VERIFICATION SAMPLING
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REPORT OF RESULTS FROM VERIFICATION SAMPLING AT OLD CENTRAL SCHOOL SITE

Background

On November 16, 1989, the Los Alamos School District requested that the Department of Energy verify that residual hazardous materials from early operations at Los Alamos National Laboratory do not remain on its property on Central Avenue. This report summarizes the results of a sampling effort by the Environmental Protection Group (HSE-8) for the Environmental Restoration Program (HSE-DO/ER) that was carried out to verify the absence of such materials from this property. The sampling followed the procedures outlined in the document entitled "Work Plan for Verification Sampling at Old School Site on Central Avenue," (Los Alamos National Laboratory LA-UR Report [January 1990]).

At the time of the request from the school district, Steve Slaten of EPA's Region VI was contacted concerning the request made of the Laboratory. The concern was how EPA should be involved in the protocol for proceeding with the sampling effort. EPA indicated that for this type of assessment activity, the agency would be satisfied with receiving an informational copy of the scope of work and sampling plan, which subsequently was provided to him. Should any contamination be found, EPA would then have to be more actively involved in an interim cleanup action.

The property in question is located in downtown Los Alamos, bounded by Central Ave., Rose St., and 23rd St (Figure 1). The western tip of this property was crossed by a subsurface industrial waste line that connected the old main technical area (TA-1) with the old liquid waste treatment facility (TA-45) (U.S. Department of Energy report DOE/EV-0005/14, "Formerly Utilized MED/AEC Sites Remedial Action Program. Removal of a Contaminated Industrial Waste Line, Los Alamos, New Mexico," April 1979). This line represents the only Laboratory use of the land that could have contributed to the potential for the presence of hazardous constituents. The line was removed from the property in 1965 and adjacent soil material was removed if then current guidelines for residual radioactivity in the soil were exceeded. Other residual contaminants would have been removed with the radiological residuals.

Field Sampling Approach

On January 17, 1990, the Environmental Protection Group (HSE-8) carried out a verification survey of the former waste route through the school property to confirm that hazardous constituents are unlikely to remain. The survey was designed and performed in a manner consistent with the guidelines presented in the Environmental Protection Agency's (EPA) "Test Methods for Evaluating Solid Wastes" (Office of Solid Waste and Emergency Response, SW-846, 3rd Ed., November 1986). These guidelines are the most recent set of methods approved by EPA for ensuring compliance with the requirements of the Resource Conservation and Recovery Act (RCRA).

The survey consisted of five cores spaced approximately 10 m apart along a 50 m length of the former waste line route. An additional one core was collected at about 15 m east (up gradient) of the former waste line route to serve as background. Samples were collected using the continuous

coring capabilities of a CME-55 drill rig with hollow stem auger. A 3-in. diameter (O.D.) by 5-ft long split moon sampling tube run inside 3.25 in. I.D. hollow stem auger (6.0625 in. O. D.) permitted collection of core samples about 2.5 in. in diameter. Samples for laboratory analyses were taken from a 1-m column of the unweathered tuff encountered immediately below the interface with the backfill material in the historic trench. The interface between the backfill occurred at depths of about 1.4 to 2 m beneath the surface and was readily detected in each hole by a significant change in drilling pressure. The interface was also clearly recognizable by color and texture changes in the recovered material.

All sampling procedures followed Standard Operating Procedures, Quality Assurance Procedures, and Health and Safety Procedures of the Environmental Restoration Program (U.S. Department of Energy report RPT88-ER-GN000-SOP-001, "Environmental Restoration Program Standard Operating Procedures," May 1988) and the Environmental Protection Group (Los Alamos National Laboratory report LA-UR-87-1076, "Environmental Surveillance Group Quality Assurance Project Plans," February 1987, and "Environmental Surveillance Group Safety Manual," rev. August 1989). Sampling, decontamination, document and data control, quality control, and sample analyses were consistent with SW 846. Field and trip blanks consisting of empty sampling containers accompanied samples during handling and transport of the samples to detect any cross contamination during those periods. Samples were handled and transported under a chain-of-custody tracking system.

Laboratory Analyses

Samples were analyzed by the Health and Environmental Chemistry Group's (HSE-9) analytical laboratories for RCRA hazardous constituents. These analyses were carried out

using EPA approved methodologies listed in SW-846 following HSE-9's Standard Operating Procedures for analyses and quality assurance (M.A. Gautier and E.S. Gladney (eds.) "Health and Environmental Chemistry: Analytical Techniques, Data Management, and Quality Assurance," Los Alamos National Laboratory report LA-100300-MS [1986]; M.A. Gautier et al. "Quality Assurance for Health and Environmental Chemistry: 1988," Los Alamos National Laboratory report LA-11637-MS [October 1989]). Two split samples were sent to an outside contractor laboratory as part of the quality assurance program for this effort.

The Radiation Protection Group (HSE-1) provided radiological field screening of all samples. Samples were further screened by HSE-8 for gross alpha, gross beta, and Cs-137 activity.

Results

The results of this survey revealed no residual contamination remained either for radionuclides or for RCRA-regulated hazardous constituents.

Field screening of the samples revealed no gross radioactivity above background. The results of HSE-8's screening of the samples ranged from 18 to 32 ± 6 pCi/g for gross alpha activity, with the background sample at 26 ± 6 pCi/g. Gross beta activity was ≤ 25 pCi/g for all samples. Activity concentrations of Cs-137 ranged from 0.5 to 0.6 pCi/g, well within range of regional background (W.D. Purtymun et al., "Background Concentrations of Radionuclides in Soils and River Sediments in Northern New Mexico, 1974-1986," Los Alamos National Laboratory report LA-11134-MS [November 1987]). These values remain well below the Department of Energy's threshold criteria for release of real property.

Analyses for Volatile Organic Compounds (VOC), Semi-volatile Organic Compounds, and Polychlorinated Biphenyls (PCB) all fell below limits of analytical quantification. The limits for volatile organics range from 5 to 10 ng/g (parts per billion [ppb]); for semi-volatile organics the limit of quantification is 10 ng/g. The limit of quantification for PCBs is 0.06 ug/g (parts per million [ppm]).

Samples destined for analysis of metals regulated under RCRA by reason of toxicity were prepared using the EPA's Extraction Procedure Toxicity Procedure. These samples were analyzed for eight metals: Arsenic (As), Silver (Ag), Barium (Ba), Cadmium (Cd), Chromium (Cr), Mercury (Hg), Lead (Pb), and Selenium (Se). Results for As ranged from 14 to 16 ug/L (EPA threshold limit for toxicity of 5000 ug/L); for Ag, 8 to 14 ug/L (limit of 5000 ug/L); for Ba, 0.2 to 57 ug/L (limit of 100,000 ug/L); for Cd, all results were < 10 ug/L (limit of 1000 ug/L); for Cr, < 10 to 28 ug/L (limit of 5000 ug/L); for Hg, all values were < 0.2 ug/L (limit of 200 ug/L); for Pb, < 300 to 400 ug/L (limit 5000 ug/L); and for Se, 1 to 1.5 ug/L (limit of 1000 ug/L). Thus, all results were below EPA's threshold criteria for presence of toxic characteristic metals.

None of the samples submitted to the outside contractor laboratory exhibited any detectable levels of RCRA target constituents. This confirmed the results obtained from HSE-9.

Conclusions

The results support the conclusions that, during removal of the industrial waste lines, cleanup activities removed residual contamination (if originally present) of radionuclides and RCRA regulated hazardous constituents and

that these residuals do not remain (if originally present) in quantities to pose a health hazard.

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Figure 1. Location of the Central School Sampling Project

