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APR 1996 RECEIVED

Date: April 19, 1996
Refer to: EM/ER:96-220

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: FINAL ACCELERATED CLEANUP REPORTS 01-001 (F)

Dear Mr. Garcia:

Enclosed are the final reports and Certifications of Completion for the voluntary corrective actions completed in Fiscal Year 1995. The reports with potential release sites (PRSs) listed in the Hazardous and Solid Waste Amendments (HSWA) Module of the Los Alamos National Laboratory's Resource Conservation and Recovery Act operating permit contain our request for no further action (NFA). Upon your approval of these reports, we will submit a permit modification request for NFA of these PRSs.

For PRSs not listed in the HSWA Module, reports are included as informational copies for your records.

If you have any questions, please call David Bradbury at 505-665-6208.

Thank you for your timely attention to this matter.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

Theodore Taylor, Program Manager
Los Alamos Area Office

JJ/TT/rfr

3227

Enclosures: (1) Final Reports for HSWA: C-9-001, 6-007(f), 8-005, 16-016(b), 18-001(a), 19-002, 21-013(c), 21-013(d), 21-013(e), 21-024(d), 21-024(e), 21-024(h), 31-001, 33-016, 39-007(a), and 69-001
(2) Final Reports for non-HSWA: C-0-036(a-d), C-0-041, C-10-001, C-21-027, C-36-001, 0-032, 1-001(f), 3-003(p), 3-022, 3-047(d), 3-051(c), 9-010(a-b), 16-011, 16-016(f), 20-003(c), 21-022(j), 39-002(c), 53-010, and 57-006
(3) Certifications of Completion

Cy (w/enclosures):
B. Driscoll, EPA, R.6, 6PD-N, (2 copies of HSWA)
D. Griswold, ERD, AL, MS A906
J. Harry, EM/ER, MS M992
B. Hoditschek, NMED-HRMB
R. Kern, NMED-HRMB
N. Naraine, EM-453, DOE-HQ
M. Shaner, P&PI, MS J591 (5 copies)
N. Weber, Bureau Chief, NMED-AIP, MS J993
J. White, ESH-19, MS K490
S. Yanicak, NMED-AIP, MS J993
RPF, MS M707

Cy (w/o enclosures):
T. Baca, EM, MS J591
D. Bradbury, EM/ER, MS M992
T. Glatzmaier, DDEES/ER, MS M992
D. McInroy, EM/ER, MS M992
G. Rael, ERD, AL, MS A906
W. Spurgeon, EM-453, DOE-HQ
T. Taylor, LAAO, MS A316
J. Vozella, LAAO, MS A316
EM/ER File, MS M992

Voluntary Corrective Action Completion Report for

Potential Release Site

1-001(f)
Hillside 140 Septic Outfall

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Field Unit 1

Environmental
Restoration
Project

February 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-473

Voluntary Corrective Action Completion Report
Potential Release Site 1-001(f)
Hillside 140 Septic Outfall

Environmental Restoration Project
Field Unit One
Los Alamos National Laboratory

February 1996
Revision 1

A Department of Energy

Environmental Cleanup Project

Voluntary Corrective Action Completion Report
Potential Release Site 1-001(f)
Hillside 140 Septic Outfall

DESCRIPTION

This report outlines the Voluntary Corrective Action (VCA) activities at Potential Release Site (PRS) 1-001(f), also referred to as Hillside 140. This PRS is located within Department of Energy (DOE) boundaries at the western edge of former Technical Area (TA)-1 on the northern rim of Los Alamos Canyon in the vicinity of the current Ridge Park Village Condominiums (Figure 1). The site is included in Table A of the Hazardous and Solid Waste Amendments (HSWA) module to the Los Alamos National Laboratory (LANL), Resource Conservation and Recovery Act permit.

SWMU 1-001(f) consists of the former location of Septic Tank 140 and the associated outfall which flowed into a side canyon of Los Alamos Canyon. The tank served building HT as part of the sanitary septic system. During decontamination efforts in 1975, the tank and associated piping and surrounding soil were removed. Decontamination efforts were not conducted at the upper and lower outfall areas associated with Hillside 140 due to inaccessibility by heavy equipment.

Phase I RFI sampling activities at the upper and lower outfall areas were performed in July 1992 and August 1993 in accordance with the RFI Work Plan for Operable Unit 1078. Surface soil sampling results from the 1992 investigation show that total uranium concentrations were greater than the screening action level (SAL) of 160 parts per million (ppm) in five of the samples. In 1993, additional soil samples were collected to determine the lateral and vertical extent of contamination. Results from the 1993 investigation detected no isotopic-uranium concentrations greater than SALs and no further lateral extent of uranium contamination. Preliminary risk assessment results for the recreational land use indicate that these concentrations are below levels of concern. Results of the Phase I RFI and risk assessment are provided in the RFI Report for Solid Waste Management Units (SWMUs), TA-1, Aggregates C and D. However, due to the close proximity to the Ridge Park Village Condominiums, the VCA activities were proposed at Hillside 140 as part of LANL's best management practices.

CORRECTIVE ACTION

The cleanup of Hillside 140 was conducted in accordance with the activities outlined in the VCA Plan for SWMU 1-001(f) Hillside 140 Septic Outfall. Actual field time consisted of 13 days to prepare the site for field activities and conduct radiological surveys of the site, excavate and bag soil, and transport soil from the site to the waste management area. The total volume of soil removed from the hillside was approximately 15 cubic yards, filling six and one-half B-25 boxes. The containerized soil is scheduled for disposal at TA-54, Area G.

Initial field activities consisted of extensive site preparation and two radiological surveys. Site preparation included establishing the waste management area, building and renovating hiking trails into the area of concern, constructing stormwater sediment dams, and delineating and flagging areas of concern. Radiological surveys (one using a Field Instrument for Detection of Low Energy (gamma) Radiation [FIDLER] with VIOLINIST electronics and one using a Ludlum 2221 with a 44-40 shielded Geiger-Mueller probe) were conducted at points corresponding to the 1992/1993 RFI Phase I sampling locations. As outlined in the Hillside 140 VCA Plan, statistical correlations were established between the radiological survey data and 1992/1993 fixed laboratory data for uranium. A summary of these data and correlations are provided in Annex A.

The correlations between the fixed laboratory data and the Ludlum survey data were highest; the regression model is:

$$\text{uranium} = -280 + 0.74 \text{ Ludlum}$$

where uranium is in units of ppm; and Ludlum is in units of counts per minute (cpm).

The cleanup level for this site is 4790 ppm uranium. This cleanup level was calculated using the RESRAD computer code to determine cleanup levels for individual uranium isotopes and assuming that uranium isotopes are present in natural isotopic abundance. It is based on a 15 mrem/yr dose level and a recreational trail user exposure scenario. Further details regarding the cleanup level calculation and the summary RESRAD output files are provided in the VCA Plan for this site. Using the cleanup level of 4790 ppm uranium, the regression results in a Ludlum screening cleanup level of approximately 6850 cpm. A Ludlum screening cleanup level of 6000 cpm was used in the field.

The contaminated soil identified by real-time screening was excavated by hand using hand trowels and shovels. At the lower outfall area (elevation below 7225 feet), soil and organic materials within two distinct drainage channels exceeded the cleanup level and were excavated. The northern drainage channel with elevated screening levels was approximately 15 to 20 feet long and 10 feet wide and the southern drainage channel was approximately 25 to 30 feet long and 10 to 20 feet wide. At the upper outfall area (elevation above 7225 feet), soil and organic materials within a natural drainage channel approximately 30 to 40 feet long and 10 to 15 feet wide exceeded the cleanup level and were excavated. Figure 1 shows the excavated areas and the relevant 1992/1993 RFI Phase I sample locations. While 1992/1993 sample results indicate uranium contamination was contained in the upper 0 to 6-inch interval, uranium contamination was found at depth and within subsurface organic mats. Uranium contamination extended to a maximum of three feet in the lower outfall area, and to a depth of one foot in the upper outfall area. The soil and associated organic materials were placed into 6-mil plastic bags and secured with tape. The bags were placed into 5-gallon plastic buckets and transported out of the canyon via backpacks to the waste management area. The bags were then placed into B-25 boxes for transport to TA-54 for disposal.

Once all soil and organic materials exceeding the screening cleanup level were removed, the excavated upper and lower outfall areas were covered with erosion control matting. In order to assist with erosion control, additional straw bales were strategically placed within the excavations, along the bottom of each excavation, and along the edge (slightly upgradient) of the main stormwater channel. These modifications have been outlined in the (amended) Storm Water Pollution Prevention Plan. Trails leading to the upper and lower outfall area were raked and covered with pine needles and surrounding natural debris; the main canyon trail remains open.

As outlined in the VCA Plan for SWMU 1-001(f) Hillside 140 Septic Outfall, verification sampling was not required at Hillside 140 as site cleanup activities were driven by the use of the real-time radiological screening data. To document field activities, photographs were taken of the site prior to soil removal, during soil excavation, and subsequent field restoration activities. The photographs will be part of the VCA record package at the Environmental Restoration Project Records Processing Facility.

The results presented in the RFI Report for PRS 1-001(f), in combination with the results of activities presented herein, serve as the formal request for regulator concurrence to remove PRS 1-001(f) from the HSWA module and as the formal request for DOE concurrence that PRS 1-001(f) no longer be considered a PRS for residual radiological contamination.

ANNEX A

DATA AND CORRELATION INFORMATION

Table 1
Fixed Laboratory Total Uranium and Field Screening Data

location	Total Uranium	FIDLER	LUDLUM	FIDLER (VIOLINIST III) V1 (10-20 Kev)	V2 (10-20 Kev)	V3 (52-66 Kev)	V4 (52-66 Kev)
	mg/kg	cps	cpm	cp100secs	cpm	cp100secs	cpm
	1992/3	August 1995	September 1995	September 1995	September 1995	September 1995	September 1995
01-1080 - 86*	12	130	438	8.86	5.31	50.0	30.0
01-1087 - 93*	53.6	2950	496	11.2	6.71	68.9	41.3
01-1094	2073	91500	2910	70	42	461	276.6
01-1095	581	7710	951	20	12	98.9	59.3
01-1096	10.7	1300	372	10	6	55.9	33.5
01-1097	2457	58500	3770	55	33	279	167.4
01-1098	56.9	3360	509	12.9	7.7	71	42.6
01-1109	17.7	24600	381	20.9	12.5	150	90
01-1110	849	72900	1840	43	25.8	335	201
01-1111	135	5680	369	13.9	8.34	88	52.8
01-1112	165	6740	752	17.9	10.7	96.9	58.1

* - composite samples, field screening data represent an average of the discrete values.

Table 2 provides correlation coefficients and observed significance levels (p-values) for each pairwise comparison of the variables listed in Table 1. The p-values reflect the degree of correlation (the p-value relates to a test, for each pair separately, in which the null hypothesis is that the correlation is zero; low p-values imply rejection of the null hypothesis, or that the variables probably are correlated). The correlations are all high (and highly significant) for total uranium. These correlation results provide a strong basis for believing that field screening instrumentation can be used to drive the VCA effort at this site.

The correlations presented in Table 2 clearly show strong relationships among the variables. Of particular interest is that the correlations between uranium data and LUDLUM data are the highest of those involving uranium. The correlations presented in Table 2 are based on 11 observations, consequently, the very small p-values can be considered very strong evidence in favor of a correlation between uranium and field screening data, particularly with the LUDLUM data. A scatter plot with associated regression line is provided in Figure 1 of the uranium and LUDLUM data. Of particular interest is that the correlation appears to hold across the full range of data. There is no noticeable deviation at high values. The results presented are encouraging for sites that involve radionuclides, because they imply that field screening instrumentation can be used to drive clean up efforts, and that verification sampling can be minimized.
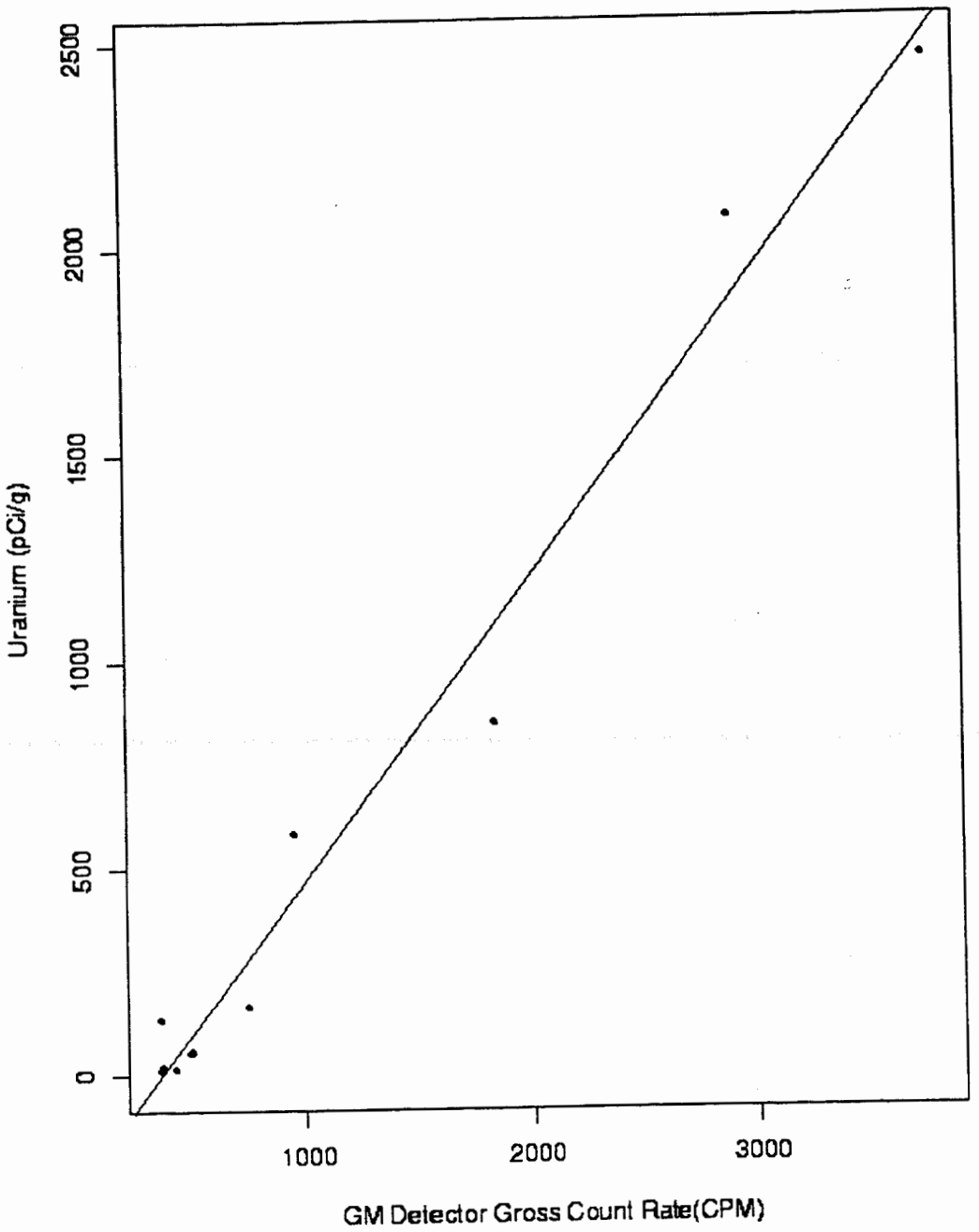
Figure 1
Scatter Plot and Regression Line for Uranium and LUDLUM Data