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National Nuclear Security Administration
Los Alamos Site Office, MS A316
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Date: August 18, 2006
Refer to: EP2006-0726

Mr. James Bearzi
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

**SUBJECT: MODIFICATION TO SCOPE OF THE INVESTIGATION WORK PLAN FOR
MATERIAL DISPOSAL AREA C, SOLID WASTE MANAGEMENT UNIT
50-009, AT TECHNICAL AREA 50**



Dear Mr. Bearzi:

On June 30, 2006, representatives of Los Alamos National Laboratory (LANL) met with Kathryn Chamberlain and David Cobrain of your staff to discuss the status of the characterization activities at Material Disposal Area (MDA) C. In the last year, a total of 32 boreholes have been drilled and samples collected. Eleven additional boreholes were identified in the work plan to be drilled in the narrow spaces between Pits 1 and 3, Pits 3 and 2, and Pits 2 and 4. Currently, 16 boreholes have been drilled in close proximity to Pits 1 through 4. Drilling the 11 boreholes between Pits 1 through 4 represents a technically challenging, potentially hazardous activity that could pose significant risk to workers and the public, and in our view, would provide little or no benefit in terms of defining the nature and extent of contamination. Therefore, LANL recommends that the 11 boreholes located between Pits 1 through 4 be removed from the work plan scope until the existing data are evaluated. As requested, the estimated radiological inventory used to support the DOE hazard categorization of MDA C is attached.

Although the data collected between the pits could potentially provide information about the maximum concentrations of contaminants at relatively shallow depths beneath Pits 1 through 4, the data will not contribute significantly to defining nature and extent beyond what is already known from data obtained from existing boreholes. LANL believes additional information would not significantly aid in or contribute to selecting a remedy for MDA C. Boreholes (BHs) 1 through BH-27 and BH-39 through BH-44 should provide sufficient data to define the nature and extent of subsurface contamination at MDA C. Lateral extent should be sufficiently defined by BH-40, BH-41, and BH-44 to the south of MDA C; by BH-42 to the east; by BH-12 through BH-17 to the north; and by BH-19 through BH-22 to the west.

Recently conducted geophysical surveys indicate that no clearly defined tuff boundary can be discerned between Pits 1 through 4. Seismic profiles indicate that the boundary between Pits 1 and 3 may be very diffuse, or even nonexistent, in places and is probably only about 5 ft thick, rather than the previously assumed thickness of 10 or more feet. Also, the seismic survey did not identify a tuff boundary between Pits 2 and 4. The



limited distance between the pits and the uncertainty associated with the existence of a boundary between pits does not afford appropriate confidence for minimizing intrusion into the pits. Pits 1 through 4 received a variety of waste streams from across LANL from 1948 to 1955. Hazardous constituents and uncontaminated classified material were buried with radioactive contaminated waste. The disposal logbooks were incomplete and do not list chemical or radioactive inventories or specific details of materials buried. In the absence of accurate inventory records and uncertainties with the pit boundaries, the risks and potential hazards associated with drilling between Pits 1 through 4 are not warranted.

LANL believes the data collected from the 32 boreholes is sufficient to define the nature and extent of contamination at MDA C and support a corrective measures study. LANL recommends that it complete a detailed evaluation of the existing data to determine if the nature and extent of contamination are defined before any consideration is given to additional sampling. Recommendations for further investigations, corrective measures, and monitoring will be included in the investigation report.

To further evaluate the correlation between tuff and pore-gas VOC concentrations, three additional boreholes will be drilled and samples collected. These data will supplement the tuff and pore-gas VOC data recently collected from BH-09. A minimum of one subsurface sample for every 50 ft of boring will be submitted for laboratory analysis. The first tuff and pore-gas VOC sample will be collected at a depth of approximately 20 ft bgs, corresponding to a depth adjacent to the disposal unit. A second tuff and pore-gas VOC sample will be collected directly below the base elevation of each pit. A third set of samples will be collected from the maximum depth of each borehole. Additional subsurface samples will be collected following the requirements specified in Section IV.C.3.c.iv of the Consent Order. Pore-gas tritium samples will also be collected at the same sampling intervals and submitted for laboratory analysis.

The proposed locations and depths for the three additional boreholes were identified during discussions with your staff and are summarized below.

(1) Between BH-14 and BH-15

The highest concentration of TCE was recently recorded in BH-14 and BH-15 at 150 ft. The proposed borehole will be drilled to a depth of 300 ft or approximately 40 ft into Unit 1g of the Tshirege Member of the Bandelier Tuff. These data will be useful in providing pore-gas/tuff VOC correlation data in the higher pore-gas VOC concentration range at MDA C.

(2) Between BH-18 and BH-19

The highest concentration of tritium was recently recorded in BH-17 at 20 ft. This borehole will be drilled to 200 ft, approximately 20 ft into Unit 1v of the Tshirege Member of the Bandelier Tuff. Tritium pore-gas data will be collected at the same intervals that VOC samples are collected and submitted for laboratory analysis.

(3) Between BH-04 and BH-05

Recently recorded pore-gas VOC concentrations in BH-04 and BH-05 were consistent with the concentrations from a number of other boreholes across


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MDA C. These data will be useful in providing pore-gas/tuff VOC correlation data in the lower pore-gas VOC concentration range at MDA C. This borehole will be drilled to 200 ft, approximately 20 ft into Unit 1v of the Tshirege Member of the Bandelier Tuff.

Drilling and collecting samples in the three additional boreholes are expected to be completed by August 18, 2006. The analytical results will be included in the investigation report, currently scheduled to be delivered by December 6, 2006.

If you have any questions, please contact Kent Rich at 505-665-4272 (krich@lanl.gov) or Tony Trujillo at 505- 845-5987 (ltrujillo@doeal.gov).

Sincerely,



Andrew Phelps, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,



for David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Office

AP/DG/KR/jr

Attachment: a/s

Cy:

A. Dorries, EP-ERSS, MS M992
G. Dover, EP-CAP, MS M992
D. McInroy, EP-CAP, MS M992
K. Rich, EP-CAP, MS M992
P. Reneau, EP-RCRA, MS M992
C. Mangeng, ADEP, MS J591
A. Phelps, ADEP, MS J591
D. Gregory, DOE LASO, MS A316
L. King, EPA Region 6
D. Cobrain, NMED-HWB
H. Shen, NMED-HWB
D. Pepe, NMED-OB
Corrective Actions File, MS M992
RPF, MS M707
IRM-RMMSO, MS A150



Ideas That Change the World
Risk Reduction & Environmental Stewardship Division
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Date: November 21, 2003
Refer to: RRES-DO:03-138

Christopher Steele
DOE/NNSA
Los Alamos Site Office
Los Alamos, NM 87544

SUBJECT: INITIAL CATEGORIZATION OF ENVIRONMENTAL SITES

Dear Mr. Steele:

This letter reports categorization of environmental sites at LANL in accordance with the corrective action 02 in the Price-Anderson Amendments Act Noncompliance Report NTS-ALO-LA-LANL-2003-0001 and LANL LIR 300-00-05.2 *Facility Hazard Categorization*.

Each site is evaluated on the basis of radionuclide inventory using a sum of ratios approach based on historical records, process knowledge, existing environmental sampling results, and engineering judgment. This approach is consistent with DOE STD-1027-92, Change Notice No. 1, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, and applicable guidance set forth in DOE G 421.1-2, *Implementation Guide for Use in Developing Documented Safety Analyses to Meet Subpart B of 10 CFR 830*.

The LANL environmental sites have been designated as potential release sites (PRS) that may include sites with current or former structures or environmental locations that are known or suspected to be contaminated with residual levels of radionuclides, volatile organic compounds, high explosives compounds, PCBs, asbestos, among other potential chemicals and contaminants of concern. The environmental restoration program is conducted under Module VIII of the Laboratory's Hazardous Waste Facility Permit issued by the New Mexico Environment Department (NMED) in accordance with the Resource Conservation and Recovery Act (RCRA). The sites have been or will be characterized (investigation of nature and extent of contamination) and considered for remediation. Remediation may include stabilizing, capping, removal or other corrective actions.

All 902 PRS sites have been categorized based on DOE STD 1027. Our best analysis identified a total of 11 new nuclear hazard category 2 and 3 sites. These are listed below. They are in TA-10, 21, 35, 49, 50, 53 and 54.

PRS No.	BRIEF DESCRIPTION OF SITE	NEW CATEGORY
21-014	Material Disposal Area A	CATEGORY 2
21-016(a)-99	Material Disposal Area MDA T	CATEGORY 2
49-001(a)-00	Material Disposal Area AB	CATEGORY 2
50-009	Material Disposal Area C	CATEGORY 2
53-006(b)-99	Underground tank (spent resins)	CATEGORY 2
10-002(a)-99	Former liquid disposal complex	CATEGORY 3
21-015	Material Disposal Area B	CATEGORY 3
35-001	MDA W Sodium Storage Tanks	CATEGORY 3
35-003(a)-99	Wastewater treatment plant	CATEGORY 3
35-003(d)-00	Wastewater treatment plant - Pratt Canyon	CATEGORY 3
54-004	Material disposal Area H	CATEGORY 3

There are 902 environmental sites at LANL that are tracked in the PRS database. Each PRS is tracked by a unique number assigned by technical area and locale in the database designed for environmental regulatory compliance <http://crinternal.lanl.gov/PRS/PRSMain.asp>. There are 424 PRS sites that have documented historical information confirming the absence of radioactive materials. Therefore, these 424 PRS are categorized as non-radiological sites without further analysis.

The remaining 478 sites have either suspected or confirmed radiological contamination from site operations and are categorized. Eleven have been categorized as HazCat 2 or 3. Two hundred and fifty-four (254) sites have been categorized as less than nuclear hazard category 3 (radiological sites). Twelve sites have been verified to be included within the safety bases of existing nuclear facilities. These are located as follows: two within RLWTF, one within WCRRF, one within TA-55, and eight within TA-54.

As we discussed on November 19th, we have not yet categorized RPRS 15-004f-99, known as Firing Site E-F. RRES and DX request support from S-ABT in completing this last environmental categorization by the end of this calendar year.

The remaining 200 sites have been determined to have radiological contamination below screening actions levels, that is, below 15 mrem, the free release criteria value in DOE Order 5400.5 *Radiation Protection of the Public and the Environment*.

Attachment 1 of this letter provides descriptions of the environmental sites, descriptions of the methodology and results of categorizations, site descriptions and maps of the 11 nuclear hazard category 2 and 3 sites, and a summary table of the sites categorized radiological. Attachment 2 provides data sheets in excel format of the 11 new nuclear hazard category 2 and 3 sites; and Attachment 3 provides site descriptions and site maps for the radiological sites assembled in numerical order.

LANL has been diligent is attempting to identify all environmental sites which are nuclear sites [HazCat 2 and 3] and radiological sites (less than HazCat 3). In my judgment, we have appropriately categorized all

environmental sites. The ER program is ongoing. We will carefully review new data as they are collected to assure that all sites are appropriately categorized.

In addition to your review and approval of the submitted characterization, two immediate activities are needed. First, to meet among DX, SBO, RRES and SABT to determine the appropriate path to categorization of Firing Site E-F. My office will be attempting to schedule that meeting immediately following Thanksgiving. Second, we need to meet [SBO, SABT and RRES] to finalize scope and schedule for the DSA covering HazCat 2 and 3 Site Monitoring and Surveillance. My office will also be attempting to schedule that discussion in the first week of December so we can very rapidly complete that DSA.

We thank you and your staff for working so closely with us to achieve the categorization of these 902 ER sites. Your assistance is greatly appreciated. If you have any questions regarding this submittal feel free to call Bill Criswell [5-5886, ER Program Manager], Dave McInroy [9-0819, DPD RS] or myself [7-2211].

Sincerely,



Beverly A. Ramsey
Division Leader
Risk Reduction and Environmental
Stewardship Division



David Satterwhite
PS-SBO-Group Leader
Concurrence

Attachments:

- 1) Methods and Results of Categorizations
- 2) Description of Worksheets in MS Excel Files for Nuclear Sites
- 3) Descriptions of Radiological Sites

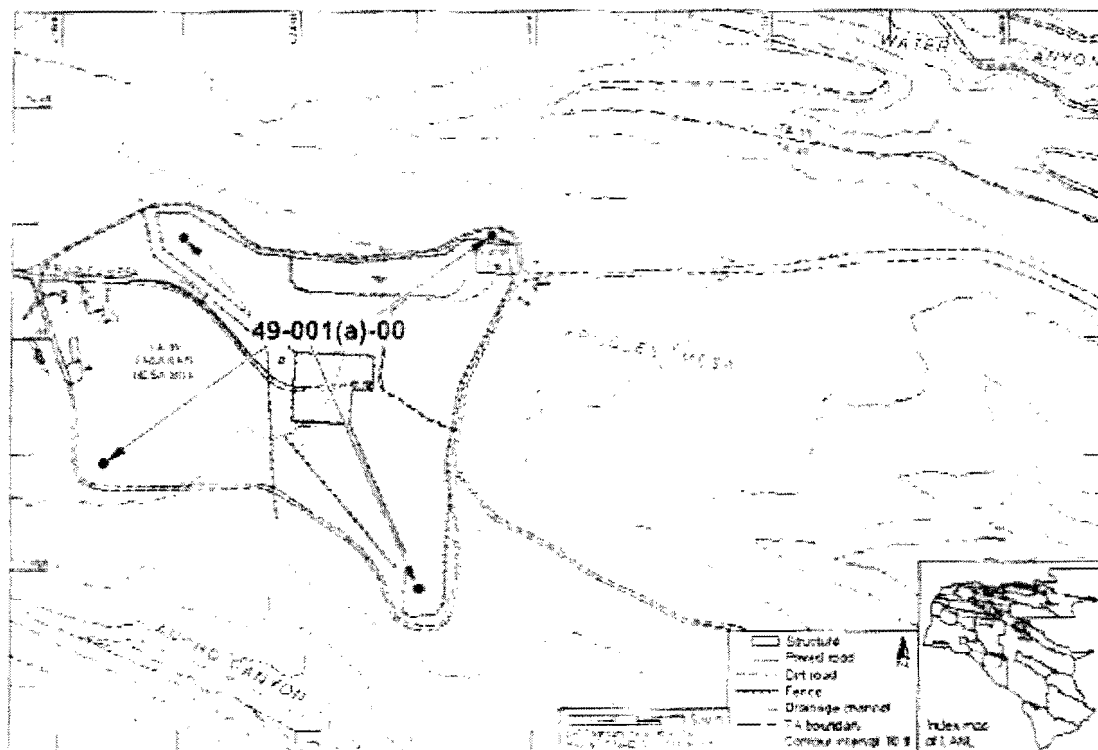
Cy (w/all attach.):

C. Keilors, DNFSB, E509
D. Satterwhite, PS-DO K561
B. Ramsey, RRES-DO, J591
C.W. Criswell, RRES-RS, M992

Cy (w/ Attach. 1)

J. Angelo, PS-DO, C347
G. Schlapper, LASO, A316
J. Vozella LASO, A316
D. Gregory, LASO, A316
L. Woodworth, LASO, A316
J. Holt, LANL- ADO, A104
R. Hurdle, RRES-DO, J591
A. Elliott, PS-PAAA, C347
D. McInroy, RRES-RS, M992
IM-5 File, A150
AD-Ops File, A104
RRES-DO File
RRES-RS File, M992

3.1.3.3 Map - MDA AB



3.1.4 MDA C 50-009

3.1.4.1 Description of Site

SWMU 50-009 is inactive MDA C, established in May 1948 to replace MDA B (SWMU 21-015). MDA C covers 11.8 acres and consists of 7 pits, 107 shafts, and one unnumbered shaft used for a single strontium-90 source disposal. Pits and shafts were used for burial of hazardous chemicals, uncontaminated classified materials, and radioactive materials. TRU waste also was buried in unknown quantities in the pits. The landfill was used until April 1974 but received waste only intermittently from 1968 to 1974. COPCs include inorganic chemicals, VOCs, SVOCs, and radionuclides. According to the OU 1147 work plan, most of the radioactivity at MDA C is associated with tritium.

Pits 1 through 5 were primarily used in the 1950's and are located in the eastern half of MDA C. Pits 1 through 4 are approximately 610 ft x 40 ft x 25 ft deep; pit 5 is 110 ft x 705 ft x 18 ft deep. Pit 6 is 100 ft x 505 ft x 25 ft deep and operated from 1958 to 1960. Pit 7, the chemical pit, is 25 ft x 180 ft x 12 ft deep and operated from 1960 to 1964. The shafts located at MDA C were used in the 1950's and mid-1960's, and typically have diameter of 2 ft, and depths ranging from 10-25 ft. Some shafts were lined with concrete.

3.1.4.2 Data Sources and Rationale

The RFI Work Plan, OU-1146 for TA-50 (LANL 1992) provides an estimated inventory for both the shafts and the pits located at MDA C (in curies). Inventories for both the pits and shafts were entered into the SOF calculation. No soil sample data or calculated volumes were employed. Strontium-90 and Yttrium-90 were analyzed as a single item. The inventories for "fission products" (50 Ci) and "activation products" (200 Ci) were provided, but were not considered in the SOF because exact compositions were unknown (their impact would be minimal since the known contributors already dictate a Category 2 status). U-233 was specifically indicated as an isotope disposed of in the shafts. "Total Uranium" was indicated as disposed of in the pits. The total uranium inventory was not included in the SOF calculation as this is already an H-C-2 facility. Further research will be required to determine isotopic distribution of the uranium. As shown in the table below, MDA C is categorized a **Hazard Category 2 Nuclear Site**.

Radionuclide	Total Curies	Total Grams	SOF Category 2	Det Category 2
H-3	2.00E+04		3.15E-20	YES
Na-22	5.80E-01	9.28E-05	SOF Category 3	Det Category 3
Co-60	2.40E+00	2.12E-03	3.23E-02	YES
Sr-90	2.10E+01	1.54E-01		Det Rad
Ra-226	1.00E+00	1.01E+00		YES
U-233	5.0E+00	5.69E-01		
Total Uranium	2.50E+01	-		
Pu-238	2.60E+01	1.52E+00		
Am-241	1.45E+02	4.25E+01		