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Date: 2-23-96
Refer to: EM/ER:96-070

RECEIVED
FEB 27 1996

Ms. Barbara Driscoll
NM Federal Facilities Section
U.S. Environmental Protection Agency
Region 6, 6PD-N
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

SUBJECT: RESPONSE TO THE NOTICE OF DEFICIENCY (NOD) FOR OPERABLE UNIT (OU) 1078

Dear Barbara:

Enclosed is the Los Alamos National Laboratory's response to the Environmental Protection Agency's (EPA's) NOD concerning potential release sites at Technical Area 1, Aggregate F of the OU 1078 Resource Conservation and Recovery Act Facility Investigation Report. A certification form signed by the appropriate officials is also enclosed. The NOD was received at the Los Alamos Area Office on November 27, 1995. The enclosed response repeats each comment from the NOD for convenience in reviewing.

Please contact Garry Allen at (505) 667-3394 or Bonnie Koch at (505) 665-7202, if you have any questions about this response to the NOD.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

for Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

Enclosures: Response to NOD
Certification

3215

xV

Cy w/enc.):
G. Allen, CST-18, MS E525
B. Garcia, NMED-HRMB
D. Griswold, ERD, AL, MS A906
J. Harry, EM/ER, MS M992
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R. Kern, NMED-HRMB
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N. Naraine, EM-453, DOE-HQ
T. Taylor, LAAO, MS A316
N. Weber, Bureau Chief, NMED-AIP, MS J993
J. White, ESH-19, MS K498
S. Yanicak, NMED-AIP, MS J993
EM/ER File, MS M992
RPF, MS M707

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

GENERAL COMMENTS:

DEFICIENCY 1

In the RFI Report for Sold Waste Management Unit Technical Area-1 (TA-1), LANL is proposing no further action (NFA) for two potential release sites (PRS) at TA-1. These two sites are 1-001(d) and 1-006(h). It is unclear what soil sampling has been completed at site 1-006(h), a storm water outfall for several buildings formerly located at this site. Ahlquist et al. (1977) reported finding "puddles" of elementary mercury in this storm drain. This storm drain serviced several buildings in the area including Building V (a uranium and beryllium machine shop), Building Y (a physics and cryogenics lab that handled radioactive materials) and Building K (a chemical stock room where mercury spills were reported to have occurred). Given this information, it would appear that sampling should have been performed around the outfall of PRS 1-006(h).

The document states that the area was not sampled because results of the investigation conducted down gradient on Hillside 138 (the outfall area for PRS 1-001(d) would reveal any potential contamination at PRS 1-006(h). What is the rationale for this statement? The figures provided indicate that PRS 1-001(d) and PRS 1-006(h) are separate outfalls. No mention is made of common drainage between PRS 1-001(d) and PRS 1-006(h). Was hot spot sampling conducted for the immediate area surrounding stormwater drain outfall point 1-006(h)?

RESPONSE

LANL will clarify its reason for requesting NFA for PRS 1-006(h). PRS 1-006(h) should have been proposed for NFA based on NFA Criterion 1, the PRS has never been used for the management of RCRA solid or hazardous wastes or hazardous substances. [This NFA request is much the same as the NFA request for PRS 1-006(i), which is associated with Aggregate H and listed as having been reviewed by EPA January 28, 1994, in Table 1-2 of the "Request for Permit Modification, Units Proposed for NFA" (LANL 1995, 1249)]. Storm drain PRSs 1-006(h) and 1-006(i) originated at different locations around R Building. LANL was incorrect in stating that sampling at PRS 1-001(d) would reveal any potential contamination at PRS 1-006(h). The following text should replace the second and third sentences of paragraph 3 on p. 30 of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518):

> PRS 1-006(h) was not sampled during the Phase I site investigations conducted for Aggregate F in part because archival information revealed that the site had not received RCRA solid or hazardous wastes or

> hazardous substances. It will be proposed for NFA based on NFA Criterion 1, the PRS has never been used for the management of RCRA solid or hazardous wastes or hazardous substances. PRS 1-006(h) was not proposed for NFA in the RFI Work Plan for OU 1078 (LANL 1992, 0782) because of a report that puddles of mercury were found in an excavated portion. That information was later found to be in error, so no sample locations were planned for PRS 1-006(h). In addition, development of a motel and office buildings at the site radically altered the terrain. Any portion of the drain that had been an open channel was regraded or buried with fill, and portions that were buried conduits were, for the most part, buried deeper and/or built over.

Table 6.8-1 on p. 6-32 of the RFI Work Plan for OU 1078 (LANL 1992, 0782) incorrectly identifies plutonium-239, uranium-235, uranium-238, mercury, and tritium as suspected contaminants. The presumption that mercury was associated with this PRS came from an incorrect reading of a mid-1970s decontamination report (Ahlquist et al. 1977, 0016). A portion of the report is included as Attachment 1 to this Notice of Deficiency (NOD). Figure 73 and text on p. 79 of the Ahlquist et al. report (1977, 0016), if carefully read, indicate that another buried conduit, a 1-ft concrete pipe no closer than 16 ft to PRS 1-006(h) had "small puddles of elemental mercury which were removed." (The actual separation in trench Y2A was about 35 ft). Supporting evidence that the conduits are not the same is that the storm drain is a 18-in.-diameter, corrugated, galvanized metal pipe at the discharge end. Thus, a correct reading of the Ahlquist et al. decontamination report (1977, 0016) eliminates mercury as a COPC for PRS 1-006(h). The only basis for having included plutonium-239, uranium-235, uranium-238, and tritium as suspected contaminants is that Y Building had a waste outlet with "high alpha and gamma radiation," as stated in Subsection 6.8.2 on p. 6-31 of the RFI Work Plan for OU 1078 (LANL 1992, 0782). The work plan incorrectly applies contaminant information from a building or waste drain to the storm drain PRS 1-006(h).

The location of PRS 1-006(h) was given correctly in the RFI Work Plan for OU 1078 (LANL 1992, 0782). From the northwest side of R Building (housing model, glass, carpentry, and plumbing shops), past the east side of Y Building (a physics laboratory), the storm water drain discharged onto Hillside 138, west of the Septic Tank 138 outfall. Building V was too far north and west and K Building was too far west to have been serviced by the storm drain.

PRS 1-006(h) should be struck from the last sentence of Subsection 4.3, Conclusions, on p. 95 of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518). The following statement should be added as a final paragraph:

> Based on archival information obtained after submittal of the RFI Work Plan for OU 1078, PRS 1-006(h) is recommended for NFA using Criterion 1, the PRS has never been used for the management of RCRA solid or hazardous wastes or hazardous substances.

DEFICIENCY 2

It is recommended that this report be revised to incorporate risk-related agreements concurred on by EPA and LANL at EPA Region 6 offices on September 18-19. For example, background values proposed by LANL at the aforementioned meeting do not correspond to those provided in this report. In addition, the upper tolerance limit (UTL) used in this ER project is the 95% upper confidence bound on the estimated 99th percentile. The EPA and LANL agreed upon the use of the 95% upper confidence bound on the estimated 95th percentile for the UTL for determination of background values given that the proper statistical assumptions stipulated for calculation of the UTL are met.

RESPONSE

LANL requests that the risk-related agreements on which EPA and LANL concurred at EPA Region 6 offices in September be incorporated only in reports submitted to EPA after October 1. However, LANL has tabulated the differences resulting from using the UTL:95,95 in the screening assessment. The results of this tabulation are included in the response to Deficiency 5 and in Attachment 2 of this NOD.

SPECIFIC COMMENTS:

DEFICIENCY 3

3.0 Data Assessment and Analysis Approach, p. 9 - In the last sentence on page 9, LANL states that background comparisons to soil concentrations is preferable to screening action level (SAL) comparisons. Comparing soil concentrations to background is acceptable as long

as risk due to background based on a SAL is provided. This is in keeping with the understanding established at meetings between EPA and LANL held in Dallas, Texas, on September 18-19, 1995.

RESPONSE

LANL reiterates the entirety of its statement from p. 9 of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518), "...there is a need for both background comparisons and comparisons to SALs or ESALs. Also, there are a few chemicals (e.g., arsenic, beryllium) for which SALs or ESALs are within the range of available background. *In these cases,* background comparisons are preferred." LANL did not intend to imply that comparing soil concentrations with background is always preferable to comparing them with SALs. However, the statement will be replaced with the following:

> ...there is a need for both background comparisons and comparisons with SALs. Also, there are a few chemicals (e.g., arsenic, beryllium) for which SALs are within the range of available background. In these cases, background comparisons *only* are performed.

DEFICIENCY 4

Figure 3-1, p. 10 - Suggest that Figure 3-1 be revised to reflect decisions with respect to COPC concentrations greater than background.

RESPONSE

The data analysis and screening assessment decision logic flow chart (Fig. 3-1) included in the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518) indicates that COPCs detected at concentrations greater than background are subsequently compared with SALs or other applicable regulatory levels for that COPC. Because the flow chart does reflect decisions with respect to COPC concentrations greater than background, no revisions to the figure are necessary.

DEFICIENCY 5

3.2.1 Background Comparisons, p. 19 - Please refer to comment number 2 above.

RESPONSE

LANL requests that the risk-related agreements on which EPA and LANL concurred at EPA Region 6 offices in September be incorporated only in reports submitted to EPA after October 1. However, LANL has tabulated the differences resulting from using the UTL:95,95 in the screening assessment. The complete results of this tabulation can be found in Attachment 2. The results of background camparisons for Aggregate F data do not change using the UTL:95,95. Chromium, lead, mercury, and silver are still the only inorganics carried forward to the SAL comparison step, and the same six radionuclides are still carried forward in the screening assessment process.

DEFICIENCY 6

Figure 3-2, p. 22 - Suggest that Figure 3-2 be revised to reflect decisions with respect to risk-related agreements concurred on by EPA and LANL at EPA Region 6 on 9/18-19/95.

RESPONSE

In accordance with conversations between LANL ER Project personnel and EPA Region 6 Officials, further ecological risk assessment at this site will be deferred until the site can be assessed as part of the new Ecological Exposure Unit approach that is being developed by LANL in conjunction with EPA and the NMED. Any relevant agreements between LANL and EPA will be reflected in the decision logic flow chart and any other materials used in the Ecological Exposure Unit approach to ecological assessment.

DEFICIENCY 7

3.2.4 Ecotoxicological Screening Action Levels Comparisons, p. 24 - Revise utilization of ecotoxicological screening action levels (ESALs) per comments received on the draft LANL Ecotoxicological Risk Screening Methodology document.

RESPONSE

In accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as part of the new Ecological Exposure Unit approach that is being developed by LANL in conjunction with EPA and NMED. Any relevant agreements between LANL and EPA will be reflected in material used in the Ecological Exposure Unit approach to ecological assessment.

DEFICIENCY 8

Figure 4-2, p. Sampling locations 01-6077 and 01-5228 are listed in Figure 4-2 and subsequent sampling figures but no data are provided for these locations in Appendices A1-4.

RESPONSE

Sample locations 01-6077 and 01-5228 were surveyed and recorded in the Facility for Information Management, Analysis, and Display (FIMAD), but no analytical samples were collected at these locations. Sample locations 01-6077 and 01-5228 will be stricken from all figures in the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518).

DEFICIENCY 9

4.1.3.1.1 Inorganics, p. 57 - The second paragraph states "The results for nickel and beryllium also are not surprising considering the large number of non-detects (greater than 66%) in each of these data sets." LANL then removes these constituents based on background comparisons. The highest sample of beryllium (50 mg/Kg) is located at the sampling locations closest to the septic outfall. The next set of sampling locations identifying beryllium are located at the bench area where settling out of runoff would be expected. In addition, page 27 notes that Building V, formally located at TA-1, housed a uranium and beryllium machine shop which was connected to the septic system now comprising PRS 1-001(d). This strongly suggests that the beryllium concentrations identified at this location are the result of contamination, not background concentrations. LANL should consider retaining beryllium as a COPC given location and concentrations of beryllium as well as location of non-detects.

RESPONSE

The number presented in the RFI report, 50 mg/kg, was a "presumed concentration" for a composite sample. The presumed value was obtained by multiplying the detected concentration of 10 mg/kg by the five increments that make up this composite sample (LANL 1995, 09-0518). Beryllium was not detected at a level of 50 mg/kg. Furthermore, because of unclear analytical laboratory reporting, the beryllium value for sample AAA1520 was incorrectly reported as 10 mg/kg. The value should have been reported as <10 mg/kg. Sample results for AAA1511, AAA1512, AAA1518, AAA1519, and AAA1520, were analyzed under request number 13381 (sample AAA1520 was the only composite in this group). All sample results for beryllium under

this request number should have been reported as <10 mg/kg. The reporting limit for beryllium is uncommonly high in this request because of the dissolution and analytical procedures used, which make the data values highly questionable. For the other 6 requests and 36 associated samples which were analyzed for beryllium, the reporting limits ranged from 1 mg/kg to 1.3 mg/kg.

All the beryllium data indicated in the RFI Report, including the change in detection status for the beryllium result for AAA1520, were included in the background comparisons described in Attachment 2. As stated in Attachment 2, background comparisons performed for beryllium indicate that overall site beryllium concentrations are not different than background beryllium concentrations. Although it is possible that beryllium from V Building operations entered Septic Tank 138, no beryllium concentrations above UTL were detected near the septic tank drainline outfall where they would be expected to be present as a result of machine shop activities.

There are two further concerns relating to the samples in which beryllium was detected. First, most of the samples in which beryllium was reported as detected are associated with one laboratory request number (13611), which could be indicative of an analytical chemistry problem. Second, the sample locations for these samples are below the two areas of comparatively high concentrations of the identified COPCs (mercury, plutonium, lead and cesium), which, perhaps, throws further suspicion on the analytical chemistry. It is difficult to find an argument that supports the presence of beryllium in the drainage channel without some evidence of beryllium in the upper reaches. As stated above, even including the data from request number 13611, overall site beryllium concentrations are not different than background beryllium concentrations. It should also be recognized that the risk scenario used at this site involves a trail user, and consequently, these comparatively low levels of beryllium in soil are unlikely to pose a threat to human health.

DEFICIENCY 10

Figure 4.8, p. 68-71 - Mercury concentrations are discussed on page 68. On page 71, Figure 4.8 presents sampling sites identifying those locations that exceed the SAL. Sampling site 01-5228 is listed as exceeding the mercury SAL but no data for sampling conducted at 01-5228 is provided on page 69 (Table 4-5) or in Appendix A, Table A-4. Please review the sampling location and provide appropriate sampling results.

RESPONSE

As stated in the response to Deficiency 8, sample location 01-5228 has no analytical data associated with it. The location was mistakenly included on the figure and it should be struck.

DEFICIENCY 11

4.1.3.3.2 Storm water, p. 75 - Mercury was detected in runoff at concentrations greater than 21 mg/L. The acute ambient water quality criterion (AWQC) for mercury is 2.4 µg/L. The concentration in runoff is about 4 orders of magnitude (10,000 times) greater than the acute AWQC. Over time, this concentration of mercury, even with dilution, may pose a problem should the runoff reach streams/sediments in the canyons. Lead was measured as high as 440 mg/L in runoff samples while the acute AWQC for lead is 0.082 mg/L. LANL should review potential for ecological risk to canyon waterbodies from runoff.

RESPONSE

All values reported in mg/L in Subsection 4.1.3.3.2 of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518) and in Table A-5 of Appendix A should have been reported in ug/L. As noted in detail in the response to Deficiency 17, a Voluntary Corrective Action (VCA) plan was recently submitted to the NMED Surface Water Quality Bureau to respond to concerns that mercury was observed in some of the storm water samples. Moreover, in accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as part of the new Ecological Exposure Unit approach that is being developed by LANL in conjunction with EPA and NMED. LANL will review all ecological information when the Ecological Exposure Unit that includes PRSs 1-001(d) and 1-006(h) is evaluated.

DEFICIENCY 12

4.1.4 Ecotoxicological Screening Action Levels Comparison, p.77 - See comment number 8 above. The soil ESALs presented for metals in Table 4-9 are all at or below LANL background levels which draws into question their usefulness and validity.

RESPONSE

In accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site can be assessed as part of the new Ecological Exposure Unit approach that is being developed by LANL in conjunction with EPA and NMED. In the interim, LANL has submitted a VCA plan to the NMED (copied to EPA) in an effort to address NMED Surface Water Quality Bureau concerns. The VCA plan submitted February 9, 1996 includes removal of soil contaminated with mercury, control of storm water on the bench between the upper and lower cliffs, and storm water monitoring (for more detailed information on the VCA plan, see the response to Deficiency 17).

DEFICIENCY 13

Table 4-15, p.88 - The inhalation RfC is reported as 9E-05 mg/kg-d and footnoted as the value for elemental mercury. This is incorrect and Table 4-15 should be revised. The inhalation RfC for elemental mercury reported in the text on page 88 is correct (3E-04 mg/m^3). Also note the units for inhalation in Table 4-15 should be mg/m^3.

RESPONSE

The inhalation *RfD* reported in Table 4-15 is in units of mg/kg per day. Assuming a daily inhalation rate of 20 m^3/day and a body weight of 70 kg, the corresponding *RfC* is 3E-04 mg/m^3. Footnote d of this table correctly states that this value is specifically for elemental mercury vapor. No change in the RFI report is required.

DEFICIENCY 14

4.2.4.1 Nonradionuclides, p.90 - In the last paragraph of page 90, HQs for mercury are referenced to Table 4-15. The correct citation is Table 4-16.

RESPONSE

LANL will change the table callout to refer to Table 4-16.

DEFICIENCY 15

4.2.4.1 Nonradionuclides, p. 90 - The sentence at the bottom of the page should clarify that "individual pathway HQs range from 0.006 to 0.3 for both best estimate and reasonable maximum exposure (RME) calculations." The RME HQ for mercury for all pathways for the upper bench totalled 0.6. The document should report and discuss HQs for the upper and lower benches and differentiate between HQs for best estimate and reasonable maximum exposure.

RESPONSE

LANL will expand the discussion regarding hazard quotients (HQs) for the upper and lower benches, and the HQs for the best estimate and reasonable maximum exposure scenarios will be more clearly differentiated. The sentence at the bottom of p. 90 of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518) should be replaced by the following text:

> As shown in Table 4-16, the HQs for the upper bench range from 0.00003 to 0.3 for the individual pathways; the hazard indices (HIs) for the RME and best estimate scenarios are 0.01 and 0.6, respectively. For the lower bench, the HQs for the individual pathways range from 0.00001 to 0.09; the HIs for the RME and best estimate scenarios are 0.006 and 0.2, respectively. All HQs and HIs are below 1, indicating that exposure to mercury by a trail user at Hillside 138 should not result in adverse noncarcinogenic health effects.

DEFICIENCY 16

4.2.4.3.1 Site Conditions, p.92 - LANL states that the difference between mean and UCL values for the upper and lower benches is likely attributable to the small sample size and presence of outliers. Given that the outfalls of each PRS are located closer to the upper bench, the difference appears just as likely attributable to hotspots.

RESPONSE

The statement that the difference between mean and UCL values for the upper and lower benches is likely attributable to the small sample size and presence of outliers is most directly applicable to UCLs. It is less clear that this is the reason for the difference in mean values for the upper and lower benches. Based on the data, however, there is no statistical difference between the contaminant concentration distributions for the upper and lower benches [for more

information, refer to Table B-9 in the Statistical Appendix of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518)], in which case it was also suggested that the actual difference in means might be attributable to the difference in sample sizes (through the phenomenon of "regression towards the mean"). Although this may be a reasonable explanation, it is less defensible than the explanation offered for differences between UCLs. Consequently, the words "mean and" should be struck from the sentence on p. 92 of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518).

DEFICIENCY 17

4.3 Conclusions, p. 94 - In the last paragraph, the document states "further evaluation of the entire data set indicates that the concentrations of these (12 chemicals) in soil samples collected downgradient of Hillside 138 are consistent with background levels." How is this possible when LANL reported that only arsenic sample concentrations at PRS 1-001(d) and PRS 1-006(h) were determined to be below background before (see page 57)?

RESPONSE

Table 4-1 on p. 49 of the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518) lists samples with inorganic concentrations that exceed UTLs. Locations described as "bottom of canyon" (the RFI report text used the equivalent description "downgradient of Hillside 138") are where composite samples were collected and the number of grabs in a composite was used to multiply the reported concentration to get a presumed concentration. If the reported values are compared with the UTLs for AAA0749, AAA0750 and AAA0751, then mercury is the only inorganic for which the sample concentrations exceed the respective UTL. The grab sample AAA0747 had the highest reported mercury level for samples collected in the bottom of the canyon (0.5 mg/kg).

Because storm water was collected in the bottom of the canyon during a high, turbid flow runoff that had mercury exceeding the default stream standard for wildlife (i.e., 0.000012 mg/L), a VCA plan was submitted to the NMED Surface Water Quality Bureau on February 9, 1996. This plan includes removal of soil contaminated with mercury, controls on storm water on the bench between the upper and lower cliffs, and future storm water monitoring.

Further, the statement cited in the deficiency is included in the ecological portion of the conclusions. In accordance with conversations between LANL ER Project personnel and EPA Region 6 officials, further ecological risk assessment at this site will be deferred until the site

can be assessed as part of the new Ecological Exposure Unit approach that is being developed by LANL in conjunction with EPA and the NMED. LANL will review all ecological information when the Ecological Exposure Unit that includes PRSs 1-001(d) and 1-006(h) is evaluated.

DEFICIENCY 18

5.0 References, p.97 - The citation for RAGS throughout the text is "(EPA 1989, 0304)." In the reference section, the citation is (EPA 1989, 0305).

RESPONSE

The citation in the reference section is correct. Text references to "Risk Assessment Guidance for Superfund, Volume I," should be changed to (EPA 1989, 0305).

REFERENCES

Ahlquist, A. J., A. K. Stoker, and L. K. Trocki, December 1977. "Radiological Survey and Decontamination of the Former Main Technical Area (TA-1) at Los Alamos, New Mexico," Los Alamos Scientific Laboratory Report LA-6887, Los Alamos, New Mexico. **(Ahlquist et al. 1977, 0016)**

EPA (US Environmental Protection Agency), December 1989. "Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)," Interim Final, EPA 540/1-89/002, Office of Emergency and Remedial Response, Washington, DC. **(EPA 1989, 0305)**

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1078," Los Alamos National Laboratory Report LA-UR-92-838, Los Alamos, New Mexico. **(LANL 1992, 0782)**

LANL (Los Alamos National Laboratory), March 1995. "Request for Permit Modification, Units Proposed for NFA," Los Alamos National Laboratory Report LA-UR-95-767, Los Alamos, New Mexico. **(LANL 1995, 1249)**

LANL (Los Alamos National Laboratory), July 1995. "RFI Report for Solid Waste Management Units at TA-1, Aggregate F," Los Alamos National Laboratory Report LA-UR-95-2680, Los Alamos, New Mexico. **(LANL 1995, 09-0518)**

Longmire, P. A., D. E. Broxton, and S. L Reneau (Eds.), October 1995. " Natural Background Geochemistry and Statistical Analysis of Selected Soil Profiles, Sediments, and Bandelier Tuff, Los Alamos, New Mexico, Los Alamos National Laboratory Report LA-UR-95-3486, Los Alamos, New Mexico. **(Longmire et al. 1995, 1266)**

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ATTACHMENT 1 ARCHIVAL INFORMATION ON PRS 1-006(h)

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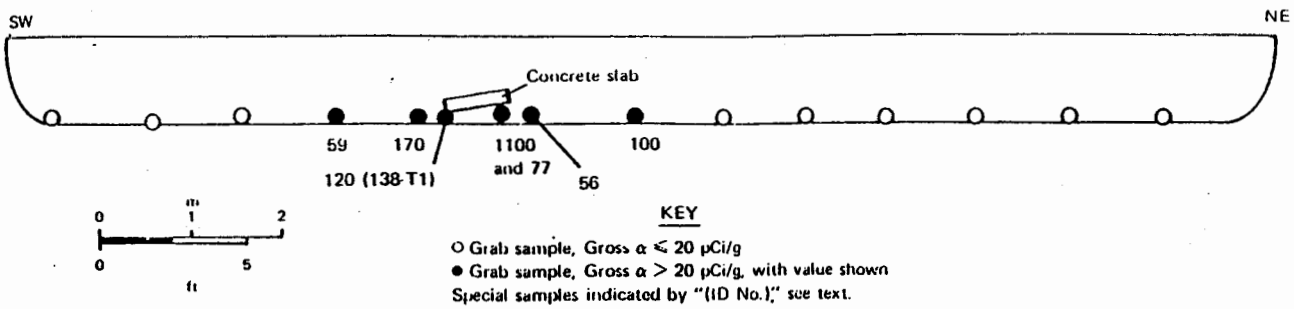

Fig. 68.
Cross section of Trench 1 in area of Septic Tank 138 (looking northwest).

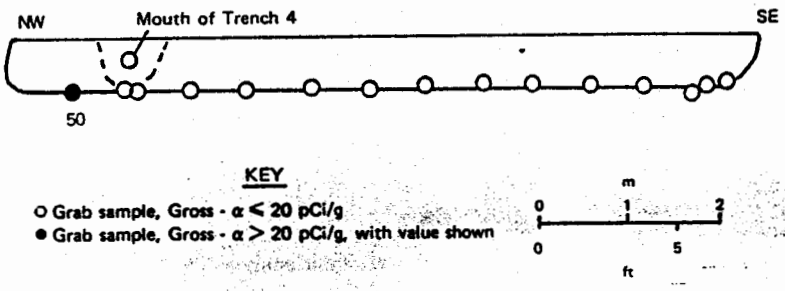

Fig. 69.
Cross section of Trench 5 in area of Septic Tank 138 (looking northeast).

ERDA land just below the trench was also investigated. Surface samples from this hillside showed gross-alpha activity as high as 3600 pCi/g, confirmed by radiochemistry to be ^{239}Pu as shown in Table XIII. Follow-up sampling lower on the hillside, below a 15-m-high cliff, located gross-alpha activity to 8900 pCi/g (Fig. 67).

The outfall line from Tank 138 was finally located and followed (Trench 5) to Tank 138 below the floor of a storage shed attached to an office building. When the tank was removed (with the owner's permission), it held ~0.6 m of uncontaminated sludge. Neither the outlet line nor broken pipe shards found at the inlet were contaminated. The inlet line is probably still in place under the office building; the portion leading to the tank evidently had been broken during building construction.

Although the tank contents were not contaminated, the soil around the tank was (Fig. 70). After some soil had been removed (remaining gross-alpha activity concentrations are shown in Fig. 71), the hole was backfilled. Figure 72 shows the excavation, with a building jack left in place to provide support for the shed wall. The excavation was deeper along the eastern edge because activity had followed a clay-filled joint in that area. Radiochemical results are given in Table XIV for each of the soil samples mentioned in Fig. 71. The ^{239}Pu activity indicated in Table XIV is within a factor of 2 of the gross-alpha activity measured by the ZnS detector system.

The reason for the contamination around Septic Tank 138 is not known. In an attempt to discover a possible source, Trenches Y1, Y2, and Y2A were dug upslope of the 138 pit. Locations of the trenches are given in Fig. 73. Former sewer and storm drains were found in those Y trenches and one 0.31-m-diam concrete pipe contained small puddles of elemental mercury which were removed, but no radioactivity was found.

Former TA-1 personnel who had worked in the vicinity could not identify a likely source for the contamination around Tank 138 and on the hillside below. Considerably more ^{137}Cs was associated with

Fig. 72.
Septic Tank 138 excavation before backfilling.

TABLE XIV

PLUTONIUM CHEMISTRY RESULTS FOR POSTCLEANUP SAMPLES FROM AREA OF SEPTIC TANK 138
(In pCi/g)

Sample Identification	ZnS Gross Alpha	^{239}Pu[a]
C	<20	29
E	47	74
F	<20	22
G	100	100
H	<20	47
I	41	61
J	<20	7
K	<20	45

[a]Isotopic analyses for ^{239}Pu were made, but all values were <1% of the ^{239}Pu values.

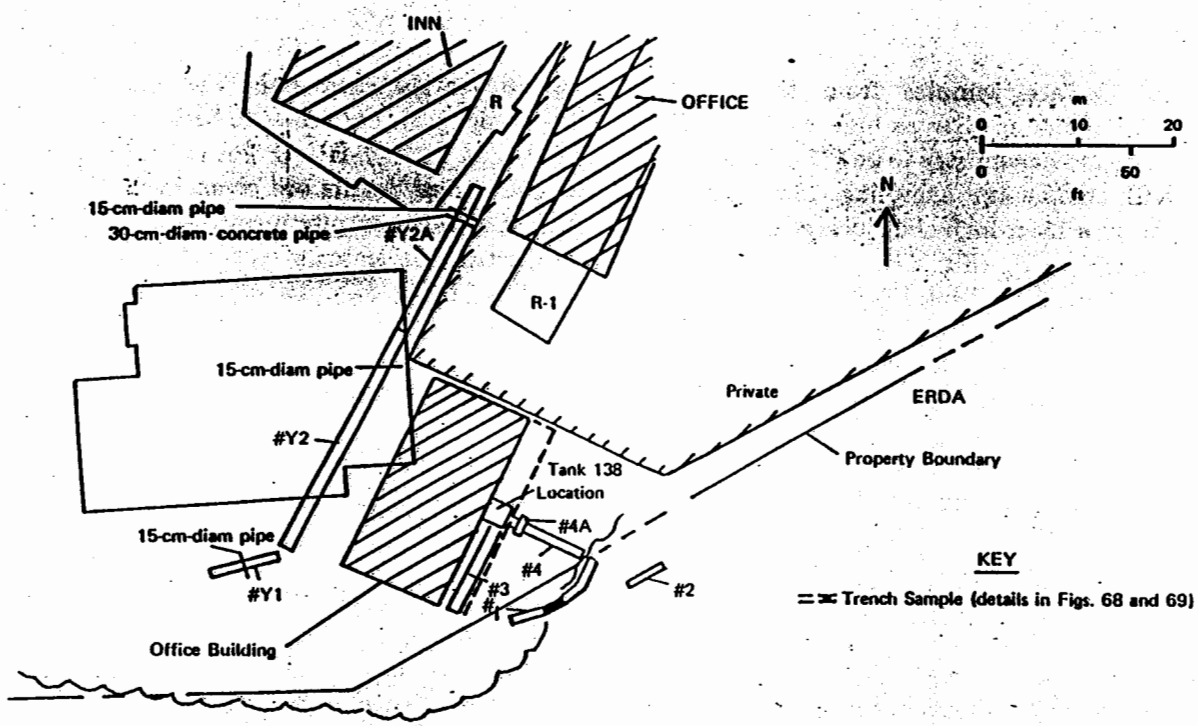

Fig. 73.
Y-Building trenches.

ATTACHMENT 2 BACKGROUND COMPARISONS PERFORMED USING THE NEW BACKGROUND DATA SET

The purpose of this attachment is to report results of background comparisons performed using the new LANL background data (Longmire et al. 1995, 1266). New UTLs are available for initial background comparison, and a new background data set is available for proper statistical testing (for inorganics only). The new UTLs are 95% upper confidence bounds on 95th percentiles. Recent simulation studies performed at LANL and, independently, at Rocky Flats Plant and Pacific Northwest National Laboratory indicate that the probability of false positive results from background UTL comparisons, for which the UTLs are based on 95% upper confidence bounds on 99th percentiles, is very high if the background data set contains many observations, which is the case at LANL. Conversely, the probability of a false negative is negligible. Consequently, the approach taken to background comparisons is to first compare with UTLs and then perform more appropriate statistical tests when UTLs are exceeded.

One final note on the testing procedures before reporting the results: Because concentration data at LANL contain several non-detects and do not otherwise appear to satisfy normality assumptions, non-parametric tests are preferred for further background comparisons. The Gehan modification to the Wilcoxon Rank Sum test and the Quantile test, both of which account reasonably for non-detects, were used for these evaluations. The Gehan test is best suited for assessing complete shifts in distribution, whereas the Quantile test is better suited for assessing partial shifts. Between the two tests most types of difference between distributions can be captured. Observed significance levels (p-values) for these tests are reported for decision making purposes. If a p-value is less than some small probability, typically 0.05, then there is some reason to suspect that there is a difference between the background and site distributions; otherwise, no difference is indicated.

The purpose of running these new background comparisons at this point is to determine if the conclusions reported in the current version of the Aggregate F RFI Report still hold true with the new and more complete background data. The following paragraphs report the results of background comparisons performed using the new background data set for Aggregate F.

Inorganics

In the RFI Report for TA-1, Aggregate F (LANL 1995, 09-0518), chromium, lead, mercury, and silver were identified as having concentrations greater than UTLs. With the new UTLs, antimony, arsenic, barium, beryllium, chromium, lead, mercury, nickel, and silver are identified

as having concentrations greater than background. The results for these chemicals are discussed in turn.

Antimony: One reported concentration was above the new UTL of 1 mg/kg. However, the Gehan test and the Quantile test resulted in p-values of 0.51 and 0.76, respectively, indicating that the antimony site data are not statistically different than background.

Arsenic: The only concentrations of arsenic that were reported above the new UTL of 7.82 mg/kg were presumed concentrations from composite samples. The Gehan test and the Quantile test both indicate that arsenic site data are not greater than background because the p-values of these tests are both 1.

Barium: Six barium concentrations were reported above the new UTL of 315 mg/kg. Two of these concentrations were presumed concentrations. The Gehan test and the Quantile test both had p-values greater than 0.98, indicating that barium site data are not greater than background.

Beryllium: Several beryllium concentrations were reported slightly above the new UTL of 1.95 mg/kg. The Gehan test resulted in a p-value of 0.55 and the Quantile test resulted in a p-value of 0.36 indicating that the beryllium site data are not statistically different than background.

Chromium: Several chromium concentrations were reported above the new UTL of 19.3 mg/kg. The Gehan test resulted in a p-value of 0.03 and the Quantile test resulted in a p-value of essentially 0, indicating that chromium site data may be greater than background.

Lead: Several lead concentrations were reported above the new UTL of 23.3 mg/kg. The Gehan test and the Quantile test both resulted in p-values of essentially 0, indicating that lead site data may be greater than background.

Mercury: Mercury concentrations often exceed the background threshold value of 0.1 mg/kg, and statistical tests could not be run due to lack of background information for mercury. Therefore, mercury should be carried to the next step in the screening assessment.

Silver: Silver was detected in several samples and does not have a UTL. Therefore, silver should be carried forward to the next step in the screening assessment.

For Aggregate F, using the new UTLs and performing appropriate statistical tests does not change the list of inorganics that should be carried forward to the SAL comparison step of the screening assessment. Chromium, lead, mercury, and silver remain the only inorganics carried forward to the SAL comparison step.

Radionuclides

In the current report, cesium-137, plutonium-238, plutonium-239, uranium-234, uranium-235, and uranium-238 were identified as having concentrations greater than UTLs. With the new UTLs, the same six radionuclides are identified as having concentrations above background. Because further statistical tests cannot be run for radionuclide data (LANL has not currently collected appropriate radionuclide background data), the same six radionuclides are carried forward to the next step of the screening assessment.

Summary

Performing background comparisons with the new LANL background data set and new UTLs does not affect the decision making process presented in the Aggregate F RFI Report. Exactly the same set of constituents are carried forward to the screening assessment comparison step as indicated in the current Aggregate F RFI Report.

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2/23/96

COMMUNICATIONS TRACKER

RACKER NO. C037 **DATE RECEIVED:** 11/27/95 **LOGGED BY:** **Gloria**

REQUESTOR: Neleigh/Driscoll **DOCUMENT NUMBER** none

AFFILIATION US EPA

SUBJECT RFI Report for SWMUs at TA-1, deficiencies, NFA 1-001(d) and 1-006(h), sampling locations 01-6077 and 01-5228, Building V, TA-1, Sampling Site 01-5228,

ACTION REQUIRED
● **YES** ○ **NO**

ACTION DUE DATE:
2/14/96

ASSIGNED TO
Allen, Garry

STATUS/ PROGRESS

96-011 [illegible] remedial action plan to be submitted 2/9/96

DUE DATE TO PROJECT OFFICE
~~2/23~~ ? 4/25 ?

DATE RECEIVED BY PROJECT OFFICE

ACTION DUE DATE TO LAAO

COPIES TO Tracy
Betsy
FPLs
Gloria

ACTION DUE DATE TO REGULATOR

DUE DATE TO REQUESTOR
2/14/96

APPROVALS REQUIRED
○ **Yes** ○ **No**

APPROVALS OBTAINED
○ **Yes** ○ **No**

DATE APPROVALS OBTAINED

DATE COMPLETED:

DATE SENT OUT:

RESPONSE SYMBOL NO.

COMMENTS Letter from Ted and Jorg transmitting response to deficiencies to Barbara Driscoll.

2/8 Garry to talk to Newton + [illegible] out status. Check draft. [illegible] on 2/12

96-070

ER PROJECT OFFICE COMMUNICATION FORM

Communications Tracker # C037

Date Received: 11-27-95

Requestor: David Neleigh / Barbara Driscoll

Requestor's Organization: EPA

SUBJECT: RFI report for SWMU at TA-1

Action Required | **Information**

Action Assigned To:

Gang Allen

Cy:

Tony
Betty
File

Please complete the following action: ~~[illegible]~~ letter from Ted + Gang transmitting responses to deficiencies to Barbara D.

Project Office Due Date: 2/7/96 Requestor's Due Date: 2/14/96

Call Gloria Balich at 667-4557 at least three days prior to the project office due date if it cannot be met. The project office will work with you to obtain an extension.

To help the project office identify action items, keep the original request and action item cover sheet with the response.

Notes:

Date Logged In: 11/27/95
Logged In By: GMB

Done Feb 23, 96