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Mr. Theodore J. Taylor
Program Manager
Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

Re: RFI Report for Technical Area 32, Notice of Deficiency
Los Alamos National Laboratory (NM0890010515)

Dear Mr. Taylor:

The Environmental Protection Agency (EPA) has reviewed the RFI Report for Technical Area 32 and determined it to be deficient. Enclosed is a list of deficiencies which Los Alamos National Laboratory has ninety days from the date of this letter to respond to.

Should you have any questions, please feel free to contact Ms. Barbara Driscoll at (214) 665-7441.

Sincerely,

W. Neleigh

for

David W. Neleigh, Chief
New Mexico and Federal
Facilities Section

Enclosure

cc: Mr. Benito Garcia
New Mexico Environment Department
Mr. Jorg Jansen
Los Alamos National Laboratory, MS M992



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**List of Deficiencies
RFI for Technical Area 32
Los Alamos National Laboratory**

GENERAL COMMENTS:

1. Determination of the Extent of Contamination During Phase II Sampling

According to the RCRA Corrective Action Plan (CAP), enough data to determine the extent of contamination should be collected during the RFI (U.S. OSWER EPA 1994). The number and location of proposed samples for Phase II appears to be insufficient to accomplish this requirement. For example, LANL states that for PRSs 32-002(a) and 32-003, "...a minimum of four samples will be collected in each exposure unit (500 m² for the residential scenario and 2,000 m² for the recreational scenario). Additional samples may be collected if the variability of contaminants of potential concern (COPC) within the exposure units is greater than currently expected." The objective of a RFI is to determine the nature and extent of contamination associated with a release from a PRS, including contamination in an "exposure unit". Whether the contamination is confined to the "exposure unit" is, however, coincidental.

2. Selection of Number and Locations of Septic System Trench Samples

For Phase II, LANL presents a subjective sampling plan to determine the number and locations of samples in the trenches associated with PRSs 32-002(a) and 32-002(b). The sampling plan indicates that "these sample locations will be determined judgmentally." Also, the proposed number of samples per trench ranges from one to four. According to Figure 5-3, each of these drain lines is over 100 feet long. Based on this information, EPA does not agree that one to four samples are sufficient to assess the potential contamination of the subsurface soil in these trenches. EPA recommends that the Phase II sampling plan describe a statistically-based or grid-based approach for determining a sufficient sample size and appropriate sample locations for characterizing the contamination in these trenches.

3. Field Screening

Field screening of "gross" concentrations of radioactivity and volatile organic vapors as indicator parameters was used to identify sampling locations for target analyte list (TAL) metals and semivolatile organic compounds (SVOC). No evidence was provided indicating that this approach was

appropriate. EPA found no evidence correlating "gross" concentrations of radioactivity and volatile organics with concentrations of TAL metals and SVOCs. Conversely, no evidence was provided correlating less-than-gross concentrations of radioactivity and volatile organic vapors with TAL metals and SVOCs.

According to EPA (U.S. EPA OSWER 1989, Page 3-21), indicator parameters are useful for large releases. Based on the historical information at the site, the extent of releases remains largely unknown. In addition, indicator parameters alone are not adequate to demonstrate the absence of a release because of their relatively high detection limits and because they do not account for all classes of constituents that may be present. Indicator parameters should be used in conjunction with specific constituents. EPA recommends that Phase II include sampling for specific constituents to determine the nature and extent of contamination.

4. Background Data Comparison Methodology

LANL stated that it followed the tolerance interval approach in EPA's "Statistical Analysis of Groundwater Monitoring Data" (U.S. EPA OSW 1989) for determining whether the concentration of a site constituent was statistically different from the background concentration. EPA recommends using a 95 percent coverage, however, the facility used 99 percent coverage. This approach results in a greater upper tolerance limit (UTL) value for background, compared to 95 percent coverage, and increases the likelihood that PRS contaminant concentrations will not be statistically different from background levels—that is, site contaminants will be screened out.

5. Ecotoxicological Screening Assessment Methodology

EPA recommends that LANL revise its ecological screening action level (ESAL) methodology per discussions with EPA in September, 1995.

6. Sample Chain of Custody

According to LANL, the only soil sample with a detected level of radiation (gamma) was inadvertently not transferred to a laboratory for isotopic analysis. To ensure that Phase II samples are not inadvertently discarded, EPA recommends that LANL develop, test, and implement improved sample chain of custody procedures—including sample disposal methods—for Phase II.

7. Tables Comparing Screening Action Levels with Sample Values

LANL inadvertently omitted units for the SALs in tables throughout the report (such as Tables 4-1 and 4-2). In subsequent reports, LANL should be certain that all parameters have appropriate units.

SPECIFIC COMMENTS**1. Section 3.2.1, Background Comparison Methodology, Inorganics, Page 15; and Table 3-2, List of UTLs for LANL Soil Background Data for Inorganic Analytes, Page 16**

Following the approach recommended in "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities" (U.S. EPA OSW 1989), the UTL values discussed on page 15 and presented in Table 3-2 could not be duplicated. EPA calculated UTL values with the EPA methodology for a one-sided 95 percent UCL with a coverage of 95 percent. Also, UTL values were calculated using other methods (Blank 1980; Sachs 1984). UTL values calculated with these methods were similar, but were generally less than the values presented in Table 3-2. For example, in Table 3-2, the UTL for aluminum is 123,000 milligrams per kilograms (mg/kg). Calculated values include the following:

- Aluminum value of 47,721 mg/kg, by using EPA methods with a one-sided 95 percent UCL and a coverage of 95 percent
- Aluminum value of 64,775 mg/kg, calculated by using methods described in Sachs (1984), with a two-sided 95 percent UCL and a coverage of 99 percent (although this procedure used a two-sided test instead of a one-sided test, it is conservative and produces a UTL value suitable for comparison).
- Aluminum value of 22,377 mg/kg, calculated by using methods described in Blank (1980), with a one-sided 95 percent UCL.

If the UTL values in Table 3-2 are wrong, EPA recommends that LANL revise the table and the data comparisons. Also, LANL should present the methodology that was used to calculate the UTLs including UTLs calculated on the 95 percent coverage.

2. Section 3.2.1, Background Comparison Methodology, PAHs, p 15

EPA has already commented on the inappropriateness of using another study to define the background level of PAHs at LANL.

3. Table 3-2, List of UTLs for LANL Soil Background Data for Inorganic Analytes, Page 16

For UTL calculations, guidance requires that data be normally or log-normally distributed (U.S. EPA OSW 1989). However, for the calcium data presented in Table 3-2, the coefficient of variation (COV) is 2.16, indicating that the data are non-normally distributed. PRC recommends that LANL explain how the UTL calculation was performed. If the calculation was performed with nontransformed data, it should be revised by using log-transformed data.

4. Section 4.1.1, Description of PRS 32-001, Page 21

LANL indicates that the disposition of incinerator ash is unknown. Potentially, ash could have periodically been disposed on the soil around the incinerator outside the building. In Phase II, LANL should (1) identify and discuss the reasonable scenarios for ash disposal and (2) devise a sampling strategy for characterizing the nature and extent of contamination due to ash disposal.

5. Section 4.1.2, Field Investigation and Sampling Activities at PRS 32-001, Page 21

LANL indicates that one soil sample was collected from near the base of the former incinerator, and one sample was collected downslope from the initial sampling location. The work plan indicated that a sample would be collected from immediately beneath the foundation of the former incinerator. Because the liquid wastes would have a high potential to migrate below the foundation of the former incinerator, this would have been the most appropriate location at which to assess the potential of contamination. EPA recommends that LANL (1) explain why these locations were selected and why the soil beneath the former incinerator was not sampled, (2) identify sufficient numbers of appropriate sampling locations, and (3) collect additional samples.

6. Section 4.1.3, Human Health Screening Assessment Results for PRS 32-001, Pages 21-25

The results of LANLs human health screening assessment are invalid because samples were collected from the wrong location. In Phase II, LANL should conduct the screening assessment on data collected from the correct locations.

7. Section 4.1.5, Conclusions and Recommendations for PRS 32-001, Page 26

In the Phase I investigation, LANL did not address the fate of incinerator ash. For Phase II, EPA recommends that LANL reformulate the conceptual site model for PRS 32-001 to include reasonable scenarios describing the fate of the incinerator ash, and characterize the nature and extent of contamination from all releases from PRS 32-001.

8. Section 4.2.1, Description of PRS 32-002(a), Page 26

- a. LANL states that it found archival engineering drawings showing the location of the wood septic tank. In the OU 1079 RFI Work Plan, May 1992, LANL explained that it did not know the exact location of the tank and, at best, it could position it into a 30 foot by 40 foot area. The OU 1079 RFI Work Plan for PRS 32-002(a) indicated that one sample was to be collected from each of 15 foot-by-20 foot quadrants. The area of the septic tank is about 10 percent of the area of any of the four quadrants. However, the tank existed in only one of the four quadrants, so, in at least three of the four samples, there was a high probability of detecting no contaminants. EPA contends that this approach favors not finding a contaminant associated with a release from the septic tank unless most of the soil beneath the 30-foot by 40-foot area is contaminated.

Before implementing Phase II, EPA recommends that LANL (1) review all archival information related to PRS 32-002(a), (2) reevaluate the PRS 32-002(a) conceptual site model, including probable contaminant migration pathways, (3) identify data gaps, and (4) reformulate a sampling strategy for characterizing the vertical and horizontal nature and extent of contamination associated with PRS 32-002(a).

- b. LANL does not discuss the location of the septic tank collection lines which, according to the OU 1079 RFI Work Plan, were supposed to have been excavated.

In Phase II, if the septic lines are found during excavation, EPA recommends that LANL (1) visually inspect pipes for cracks and holes to identify sampling locations for potential releases from the pipes, and (2) collect samples of soil from areas adjacent to cracks or holes.

- c. In the OU 1079 RFI Work Plan, LANL indicated that it planned on excavating (to a depth of 5 feet) to find the location of the septic tank collection system by digging perpendicular to the direction of the collection system pipes. Since septic system collection lines are positioned in the shallow subsurface soils, the chance of finding the lines is high. EPA recommends that if the pipes are located, LANL trace them to the septic tank location.

9. **Section 4.3.2, Field Investigation and Sampling Activities, Page 27**

- a. LANL indicates that two samples were collected "near" the wood debris pile. Also, "the former transformer location is currently beneath the asphalt parking area of the Los Alamos County Roads Division." Leaks or spills from the transformer would have contaminated the soil beneath the transformer, which is the most appropriate location to collect samples. EPA recommends that LANL explain why soils near the wood debris pile were selected and why the soil beneath the asphalt at the former transformer platform location was not sampled.
- b. LANL indicates that several chemicals of potential concern were identified in sediment samples collected from the drainage channel leading from the site to the stream in Los Alamos Canyon. Because ecological receptors may inhabit the stream, EPA recommends that LANL collect sediment/soil samples from several locations in the stream, specifically at the confluence of the drainage channel of the stream and downstream of the confluence.

10. **Section 4.3.4.1, Ecological Screening Action Levels Comparison for PRS 32-003, Page 32**

The facility identified lead, zinc, and Aroclor 1260 (PCB) as contaminants of potential ecological concern (COPEC), and stated that these contaminants could be transported to

sensitive habitats in Los Alamos Canyon. However, the facility dismissed lead and zinc as COPECs because the concentrations "would be too low to have any impact." One objective of a screening level risk assessment is to identify contaminants of concern to carry through a risk assessment. Sufficient evidence to support this conclusion is not presented in this report. EPA recommends that LANL conduct a qualitative ecological risk assessment with zinc and lead, as well as Aroclor 1260, for ecological receptors inhabiting Los Alamos Canyon. If an ecozone approach is approved for LANL then this information should be carried forward to the ecozone evaluation.

11. Section 4.4.2, Field Investigation and Sampling Activities, Septic Tank Location, Page 37

Because additional information was discovered in the archives for PRS 32-002(a), EPA recommends that LANL thoroughly review archives for information on PRS 32-002(b) before implementing Phase II. This effort will help focus Phase II and maximize sampling efforts.

12. Section 4.4.5, Conclusions and Recommendations for PRS 32-002(b), Page 50

In Phase II, EPA recommends that LANL sample the soils/sediments at the confluence of the drainage channels with the stream in Los Alamos Canyon and the stream sediments because contaminants may have migrated to these habitats which may support ecological receptors.

13. Section 4.4.5, Conclusions and Recommendations for PRS 32-002(b), Page 51

The facility states that "From an ecological perspective, this proposed sampling should aim towards determining the impact of any potential contamination to the biota. More generally, the proposed sampling should ultimately support a recreational risk assessment for the outfall area."

The meaning of, and the relationship between, these two statements is not clear. In Phase II, EPA recommends that LANL clarify these statements.

14. Figure 5-2, Conceptual Site Model for TA-32, Page 56

According to LANL, "no apparent releases occur from perched groundwater to an exposure pathway." LANL did not report

ground water data to support this claim. Also, LANL has not determined (1) whether perched groundwater underlies TA-32, or (2) the nature and extent of potential contamination associated with a perched aquifer.

15. Section 5.2.1.1, Potential Human Exposure, Page 57

LANL indicates that "...although contaminants could migrate to perched groundwater via faults or fractures, such perched groundwater does not present a potential human exposure pathway because the main aquifer, at more (sic) 1,000 to 1,200 feet below the site, is the only aquifer used for domestic water supply." Information presented in this report is not sufficient to substantiate this statement. The report should be revised to include information sufficient to substantiate this statement, or the statement should be deleted.

16. Sections 5.2.1.1.1-5.2.1.1.3, Continued Use by Los Alamos County Roads Division Scenario, Residential Scenario, and Recreational Scenario, Pages 57-60

For Phase II, LANL indicates that drinking water ingestion will not be evaluated as an exposure route. Since LANL plans on conducting a baseline risk assessment, EPA recommends that LANL evaluate all exposure routes.

17. Section 5.2.2, Data Needs and Data Quality Objectives, Pages 61-65

EPA contends that, because the amount of data collected in Phase I is not sufficient to characterize the nature and extent of contamination, no contaminants should be eliminated as COPCs from Phase II. While some of the Phase I data (such as PCB detections at PRSs 32-001 and 32-003) can be used to increase the focus of the investigation, EPA recommends that LANL adequately characterize the nature and extent of contamination at each PRS. EPA recommends that LANL revise its data quality objectives to reflect this objective. EPA also recommends that LANL use EPA guidance (U.S. EPA OSWER 1989) to develop a sampling plan.

18. Section 5.2.2.1, Data Quality Objectives for Phase II Investigation of PRSs 32-001 and 32-003, Page 62

According to the report, "...since PRS 32-001 and PRS 32-003 are both relatively small (approximately 20 feet in diameter), seven sampling locations will detect any spill

that is 10 feet in diameter or larger." The report also indicates that the number of samples is based on EPA guidance (U.S. EPA OTS 1985). In Table 4 of "Verification of PCB Spill Cleanup by Sampling and Analysis," EPA recommends collecting 19 samples for sampling areas that range in size from 51 to 400 square feet. The sampling area reported by LANL is about 314 square feet. Consequently, LANL should collect 19 samples at PRS 32-001 and PRS 32-003.

19. Section 5.2.2.2, Data Quality Objectives for Phase II Investigation of Drain Lines at PRSs 32-002(a, b) and 32-004, Page 62

According to LANL, "...the number and locations of samples needed for characterization of the wastes that would be generated during removal of the drain lines are determined on the basis of professional judgement." Number and locations of samples should be determined by statistical procedures rather than subjective means, because little is known about these PRSs. Because there is little historical information on these PRSs, EPA recommends that LANL consult EPA guidance to develop a statistically-based sampling plan for characterizing the nature and extent of contamination of drain lines.

20. Section 5.2.2.2, Data Quality Objectives for Phase II Investigation of Drain Lines at PRSs 32-002(a,b) and 32-004, Page 62

LANL indicates that "...this judgement is based on the length and composition of the drain line, and on the Phase I toxicity characteristic leaching procedures (sic) (TCLP) metals data." LANL did not present any TCLP data in the Phase I RFI report for TA-32. EPA recommends that LANL present adequate data to support statements. EPA also recommends that LANL report all pertinent data that have been collected from TA-32.

21. Section 5.2.2.2, Data Quality Objectives for Phase II Investigation of Drain Lines at PRSs 32-002(a,b) and 32-004, Page 62

According to LANL, "if no indications of leakage are detected, one sample per trench will be collected below the drain line and analyzed for hazardous constituents." Each of the drain lines is over 100 feet long. One sample per 100 feet of trench is not sufficient to assess the potential contamination of the subsurface soil. EPA recommends that

LANL develop a statistical-based or grid-based sampling plan for characterizing the nature and extent of contamination associated with the drain lines.

22. Section 5.2.2.3, Data Quality Objectives for Phase II Investigation of Septic Tank and Outfall Areas at PRSs 32-002(a) and 32-003, Page 63

LANL indicates that "...a minimum of four samples will be collected in each exposure unit (500 m² for the residential scenario and 2,000 m² for the recreational scenario). Additional samples may be collected if the variability of COPCs within the exposure units is greater than currently expected." According to the RCRA CAP, data sufficient to determine the extent of contamination should be collected during the RFI (U.S. EPA OSWER 1994). EPA contends that the extent of contamination associated with these PRSs cannot be determined by limiting the sampling area to "exposure units." EPA recommends that LANL follow EPA RFI guidance in developing a statistically-based or grid-based plan for sampling these PRSs.

23. Section 5.2.2.4, Data Quality Objectives for Phase II Investigation of the Outfall Area at PRS 32-002(b), Page 64

See Deficiency #22.

24. Section 5.2.2.5, Analytical Strategy for the Phase II Investigation, pages 64-65

The facility states that Level III analytical procedures will be used for confirmation samples. However, the facility has not stated what analytical level will be used to characterize the baseline nature and extent of contamination. EPA recommends that LANL indicate the level of quality of the Phase II characterization data. EPA recommends that, at a minimum, Level II data be collected in Phase II.

25. Section 5.2.3, Sampling Plan, Pages 65-76

In Section 5.2.2 (pg 61), LANL indicates that much of the Phase II data will be used to support risk assessments. In devising its sampling plan, the selection of sampling locations is critically important for developing a sound basis for a risk assessment (EPA 1990, pg. 27). For Phase II, EPA recommends that LANL collect an adequate number of samples from proper locations sufficient to support a baseline risk assessment.

26. Section 5.2.3.1, PRS 32-001: Former Incinerator Location, Page 65

See Deficiency #18.

27. Section 5.2.3.2, PRS 32-002(a): Septic Tank 32-7, Page 66

LANL indicates that "...samples will be collected at each location from the soil/tuff interface, which is expected to be less than 2 feet below ground surface (bgs)." On page 26, the RFI report indicates that the base of the septic tank was at least 4 feet bgs. EPA recommends that LANL collect additional soil samples from the soils below the base of the former septic tank to assess the potential of release and to determine the extent of any release.

28. Section 5.2.3.2, PRS 32-002(a): Inflow Pipe, Page 68

LANL indicates that "...these sample locations will be determined judgmentally (Fig. 5-3)." According to Figure 5-3, the drain line is over 100 feet long and only two samples will be collected. Two samples are not sufficient to assess the potential contamination of the subsurface soil in this trench. EPA recommends that LANL develop a statistically-based plan for sampling soils around the piping.

29. Section 5.2.3.3, PRS 32-002(b): Inflow Pipe(s), Page 70

See Deficiency #28.

30. Section 5.2.3.4, PRS 32-003: Former Transformer Location, Page 71

See Deficiency #18.

31. Appendix A, Table A-11, Summary of Non-Detected Analytes at TA-32, Page 1

The report indicates that the detection limit was greater than the SAL for m-benzidine; bis(2-chloroethyl)ether; dibenzo(a,h)anthracene; and n-nitrosodi-n-propylamine. EPA recommends that LANL explain how these contaminants were evaluated as COPCs.

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