

**Response to the Notice of Disapproval for the
Phase II Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area,
Los Alamos National Laboratory EPA ID No: NM0890010515, HWB-LANL-08-051,
Dated January 26, 2009**

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The comments are divided into general and specific categories, as presented in the notice of disapproval. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment. This response contains data on radioactive materials, including source, special nuclear, and byproduct material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy policy.

GENERAL COMMENTS

NMED Comment

1. *The enhanced visual representation of contaminant concentrations using the EarthVision program does not effectively convert a three-dimensional image to a two-dimensional figure. In some cases, sampling points appear to 'float' in the middle of the figure (e.g., Figure C-12, Distribution of Mercury at AOC 21-028(c), page C-12), making it difficult to understand this depiction of contaminant concentrations. Presentation of the Permittees' proposed sample locations is better portrayed in Figures F-2.1-1 through F-4.1-3 of the Middle Los Alamos Canyon Aggregate Area Investigation Report, Revision 1 (Report).*

LANL Response

1. Comment noted.

SPECIFIC COMMENTS

NMED Comment

1. **Section 3.1.1, Site Remediation and Proposed Sampling within the TA-02 Core Area, Site Remediation, page 9, paragraph 1:**

- a. **Permittees' Statement:** *"The presence of elevated concentrations of some COPCs at TA-02 indicates that remediation is warranted in the following areas. The proposed confirmation sampling locations (1-14) are shown on Plates 2 and 3."*

NMED Comment: *NMED acknowledges that proposed sampling locations 1-14 are shown on Plates 2 and 3; however, these locations are not labeled on Plate 2. The Permittees must label locations 1-14 on Plate 2 or revise the text so it references Plate 3 only.*

- b. **Permittees' Statement:** "Additional confirmation samples may be collected at the excavation sites if the excavation area is larger than anticipated. Table 3.1-1 provides a summary of the proposed sampling locations and depths, the objectives each, sample addresses, and the analytical suites."

NMED Comment: NMED does not approve the proposed confirmation sampling locations at Areas of Concern (AOCs) 02-004(a), 02-004(f), 02-010, and 02-011(a) because the Permittees did not provide maps identifying the boundaries of the proposed excavation sites. The Permittees must revise the Plan to include figures which depict the proposed excavation site boundaries and the proposed confirmation sampling locations.

LANL Response

- 1a. The text has been revised to reference Plate 3 only.
- 1b. Because the locations proposed for remediation are currently defined by one sample only, it is not possible to depict the excavation site boundaries and proposed confirmation sampling locations in a meaningful way. Depending on the contaminant triggering the proposed remediation, one of three approaches will be used to determine the extent of the area requiring excavation.
- Field test kits will be used to define the area where concentrations of polychlorinated biphenyls (PCBs) exceed the soil screening levels (SSLs). Once defined, the area will be excavated and confirmation samples collected. A minimum of five locations will be sampled at two depths for each excavated area, and the samples will be submitted for fixed laboratory analysis for PCBs. One sampling location will be within the footprint of the excavation, and the remaining locations will be stepped out in four directions from the excavation. This method will be used at Areas of Concern (AOCs) 02-004(f), 02-005, and 02-011(a).
 - Field-screening instruments will be used to guide removal of soil contaminated with cesium-137 at AOC 02-010. Cesium-137, a strong gamma-emitter, is readily detected with field-screening instruments to levels below the industrial screening action level (23 pCi/g). A minimum of five locations will be sampled at two depths for each excavated area, and the samples will be submitted for fixed laboratory analysis. One sampling location will be within the footprint of the excavation, and the remaining locations will be stepped out in four directions from the excavation.
 - Preexcavation sampling will be conducted to define the area where polyaromatic hydrocarbons (PAHs) exceed SSLs. Preexcavation sampling will be conducted by stepping out approximately 4 ft to the north, south, east, and west from the location of the known exceedances and collecting samples at two depths. Obvious geographic features, such as drainages and sediment accumulation, may be used to modify the step-out sampling design and/or removal. Following removal, two confirmation samples will be collected: one at the bottom of the excavation, and the other 2 ft deeper. Additional confirmation samples will be collected if lateral and vertical extent are not adequately defined by the preexcavation samples. This method will be used at AOCs 02-004(a) and 02-011(a).

The Phase II work plan has been modified to include the above information.

NMED Comment

2. Section 3.1.1, Site Remediation and Proposed Sampling within the TA-02 Core Area, Proposed Sampling, page 10, paragraph 1:

Permittees' Statement: "A reevaluation of the data indicated further sampling for some COPCs was not warranted. For VOCs, 227 of 41,598 VOC results were detects (0.5%), with a maximum concentration of 0.133 mg/kg; 91% of the detects were at or below the estimated quantitation limits (EQLs). Nitrate and perchlorate were detected at low concentrations across much of the site (90% of detected nitrate concentrations were less than 5 mg/kg, within the expected range of naturally occurring nitrate; 99% of detected perchlorate concentrations were less than 0.05 mg/kg). These distributions and concentrations are not indicative of operational releases and do not warrant further investigation. Therefore, proposed sampling suites do not include VOCs, nitrate, or perchlorate."

NMED Comment: Based on the data provided in the Report, NMED concurs that further sampling is not warranted for VOCs, nitrate, and perchlorate within the TA-2 core area. However, the Permittees' statement concerning operational releases is misleading. NMED relies on analytical results, not conclusions regarding the origin of the contaminants, to determine whether or not the objectives of the investigation were achieved. In this case, lateral and vertical extent was adequately defined for VOCs, nitrate, and perchlorate. The Permittees must remove this statement from the text.

LANL Response

- The statement has been removed from the text.

NMED Comment

3. Section 3.1.1, Site Remediation and Proposed Sampling within the TA-02 Core Area, Proposed Sampling, page 10-12, bullet 7:

NMED Comment: Based on the data presented in the Report, samples collected from Location 21 must be analyzed for TPH-DRO and semi-volatile organic compounds (SVOCs).

LANL Response

- The Phase II work plan has been modified to include total petroleum hydrocarbons—diesel range organics (TPH-DRO) and semivolatile organic compounds (SVOCs) in the analytical suite for samples collected from location 21.

NMED Comment

4. Section 3.1.1, Site Remediation and Proposed Sampling within the TA-02 Core Area, Proposed Sampling, page 12:

Permittees' Statement: "A total of 21 locations (39-59 on Plate 2) will be sampled surrounding the TA-02 core area, including to the west toward the boundary of TA-41, and to the east toward the boundary of TA-53/TA-21. These locations will be approximately 150 ft apart, except the locations to the west that will be approximately 200 ft apart."

NMED Comment: The Permittees have not adequately explained why the sampling locations to the west require a greater distance (200 feet versus 150 feet) between sampling points. The Permittees

must provide additional justification (e.g., site features, access restrictions) as to why the sampling locations to the west require a larger distance between sampling points.

LANL Response

4. The variation in distance between points was the result of trying to use individual locations to address multiple data needs. However, in response to NMED's comment, three sampling locations have been added (68, 69, and 70), and location 39 has been moved approximately 30 ft to the east. The text in the work plan has been modified as follows:

Section 3.1.1, page 12, "A total of 24 locations (39 through 59 and 68–70 on Plate 2) will be sampled surrounding the TA-02 core area, including to the west, toward the boundary of TA-41, and to the east toward the boundary of TA-53/TA-21. These locations will be no more than 150 ft apart."

Table 3.1-1 and Plate 2 have also been modified to reflect this change.

NMED Comment

5. **Section 3.2.3, Extent of Contamination and Proposed Sampling at AOC 21-028(c), North Side, page 17, bullet 6:**

Permittees' Statement: "The lateral and vertical extent for cesium-137, isotopic uranium, and tritium are defined."

NMED Comment: According to Section F-3.2.6, Nature and Extent of Contamination at AOC 21-028(c), in the Report "[a]dditional sampling is necessary to define the vertical extent of ...tritium and isotopic uranium." This contradicts the above assertion. Samples collected at AOC 21-028(C) must be analyzed for tritium and isotopic uranium, or otherwise resolve the discrepancy between the Report and the Plan.

LANL Response

5. The statement in section F-3.2.6 of the investigation report refers to the whole of AOC 21-028(c), which is made up of four separate satellite container storage areas. For discussion and investigation purposes, these storage areas have been grouped into three areas (the north, east, and southeast sides). The statement in section 3.2.3 of the Phase II work plan, page 17, refers only to the north storage area at AOC 21-028(c) and is based on data from locations 21-601066 through 21-601070. Tritium, uranium-234, and uranium-235 were each detected in just one sample collected from the north storage area. None of the detections are in the deepest sample, and the uranium isotopes are at or just above their naturally occurring background values (BVs). Therefore, both statements are correct in context, and no revision to the Phase II work plan is warranted.

The investigation report states that extent is not determined for tritium or isotopic uranium at AOC 21-028(c). The Phase II work plan concurs with this statement for the southeast storage area (section 3.2.3, pages 19 and 20) but further discusses the nature of these detections. Tritium is detected in only two samples at or below 0.3 pCi/g. Uranium-234 and uranium-235 are present in two locations (21-601079 and 21-601082) at concentrations just above their BVs. Uranium-234 was also detected at location 21-601072 at 4.91 pCi/g (2 to 3 ft below ground surface [bgs]). However, this location is laterally and vertically bounded by samples with no uranium-234 above the BV. Therefore, further sampling for tritium and uranium isotopes was not proposed in the Phase II work plan.

NMED Comment

6. Section 3.2.3, Extent of Contamination and Proposed Sampling at AOC 21-028(c), East Side, page 18, bullet 6:

Permittees' Statement: "Lateral extent is not defined for americium-241 and isotopic plutonium to the north, west, east, and southeast. However, lateral extent of americium-241 and isotopic plutonium to the northwest, southwest, and south is defined by DP Site Aggregate Area locations 21-601120, 21-601117, 21-601129, and 21-601116 of Consolidated Unit 21-023(a)-99."

NMED Comment: The locations within DP Site Aggregate Area (referenced above) being used to define the lateral extent of americium-241 and isotopic plutonium to the northwest, southwest and south of AOC 21-028(c) have increasing concentrations of isotopic plutonium with depth. For this reason, additional sampling to define the extent of isotopic plutonium was proposed in the DP Site Aggregate Area Phase II Investigation Work Plan. Because the extent of isotopic plutonium is not defined at Consolidated Unit 21-023(a)-99, and therefore not defined to the northwest, southwest, and southern portions of AOC 21-028(c), the Permittees must elaborate on whether or not the additional samples proposed in the DP Site Aggregate Area Phase II Investigation Work Plan for Consolidated Unit 21-023(a)-99 will be used to determine the extent of americium and plutonium and eventually be used in the risk assessment for AOC 21-028(c). The Permittees may also propose additional sampling locations to determine the lateral extent of isotopic plutonium, rather than relying on data from the DP Site Aggregate Area Phase II investigation.

LANL Response

6. LANL does not plan to use the additional samples proposed in the DP Site Aggregate Phase II work plan (LANL 2008, 104989) to determine the extent of americium-241 and isotopic plutonium or in the calculation of risk at AOC 21-028(c). Instead, one more location (14) will be sampled near previous location 21-601120 at Consolidated Unit 21-023(a)-99 to define the lateral extent of isotopic plutonium and americium-241 to the northwest of the east storage area. Samples collected from location 14 will be submitted for the same analyses as the other characterization samples to be collected from the east side of AOC 21-028(c). Samples from this location will be collected from 5 to 6 ft, 15 to 16 ft, and 24 to 25 ft bgs, which are the same depth intervals proposed for other samples from this site. Locations 12 and 13, which are proposed for the southeast storage area and have the same depths and analytical suite as those proposed for the east storage area, will serve to define the lateral and vertical extent to the southwest and south. Figure 3.2-2 and Table 3.2-2 have been modified to include location 14.

Although LANL does not plan to use the DP Site Aggregate data for AOC 21-028(c), it may be difficult to determine the lateral extent of contamination associated with AOC 21-028(c) because of its proximity to other sites within TA-21. Therefore, any valid data may be used, if needed, to evaluate the distribution of potential contaminants from this AOC. However, risk calculations will be run using those data specific to the site to obtain an accurate assessment of the risk associated with AOC 21-028(c).

NMED Comment

7. Section 3.3.1, Extent of Contamination and Proposed Sampling at TA-26, Mesa Top, page 20:

Permittees' Statement: "The extent of contamination was evaluated based on the results from the 17 locations on the mesa top."

NMED Comment: NMED assumes that the 17 mesa top sampling locations referenced above are the following boring locations referenced in the Report: 26-600910-600920, 26-600924 and 26-600925, 26-600928, 26-600929, and 26-600773 and 26-600774. However, as other sections in the Plan (e.g., Section 3.2.3, Extent of Contamination and Proposed Sampling at AOC 21-028(c), North Side, page 17) the Permittees must identify the sample locations from the Report used to make decisions regarding additional sampling.

LANL Response

7. The reference to 17 mesa-top locations in the Phase II work plan is erroneous. Actually 18 mesa-top locations and 21 canyon-slope locations were evaluated to determine the extent of contamination at Technical Area 26 (TA-26). Text has been modified in the following two places:

Section 3.3.1, page 20, "Figure 2.3-1 shows that 18 locations are on the mesa top, and the other 21 locations are on the canyon slope or on a bench below the mesa top."

Section 3.3.1, page 20, "The extent of contamination was evaluated based on results from the 18 locations on the mesa top (26-600910–26-600920, 26-600924, 26-600925, 26-600927, 26-600928, 26-600929, 26-600773, and 26-600774)."

NMED Comment

8. **Section 3.3.1, Extent of Contamination and Proposed Sampling at TA-26, Canyon Slope, page 22:**

Permittees' Statement: "The TA-26 site is located on the mesa top above the lower portion of Los Alamos Canyon reach LA-2 East, as reported in the "Evaluation of Sediment Contamination in Upper Los Alamos Canyon: Reaches LA-1, LA-2, and LA-3" and the "Los Alamos and Pueblo Canyons Investigation Report". The COPCs identified for TA-26 are similar to those in reaches LA-1, LA-2, and LA-3. Because similar contaminants are identified in all three canyon reaches, including those upstream and downstream of TA-26, the extent of contamination is defined for TA-26 in the downslope direction to the main drainage channel of Los Alamos Canyon. No additional sampling is warranted in the downslope direction to the canyon."

NMED Comment: The reaches are designed to identify contaminants in sediment in the canyons, not to define the extent of SWMUs and AOCs on the mesa top or canyon slope. The Permittees must therefore provide additional or alternative justification supporting the assertion that the extent of contamination is defined at TA-26 or obtain samples from the two additional locations proposed on Figure 3.3-1 (attached). Samples must be collected at the same intervals and analyzed for the same analytical suite established for the "Canyon Slope" samples in Table 3.3-1 of the Plan.

LANL Response

8. The two additional locations will be sampled as directed by NMED. Text in section 3.3-1, page 22, has been modified to describe locations 12 and 13 on the canyon slope at TA-26. Figure 3.3-1 and Table 3.3-1 have also been modified to include these additional locations. The proposed sampling depths and analytical suites are the same as the other canyon slope samples.

NMED Comment

9. Section 6.0, Schedule, page 26:

Permittees' Statement: *Based on the schedule, the Middle Los Alamos Canyon Aggregate Area Phase II Investigation Report will be submitted 24 months after NMED approves this work plan."*

NMED Comment: *NMED will provide the due date for the Middle Los Alamos Canyon Aggregate Area Phase II Investigation Report in its approval of the Plan.*

LANL Response

9. Comment noted. Laboratory and DOE personnel would be pleased to meet with NMED staff at their convenience to discuss the schedule for this work.

NMED Comment

10. Appendix B, Section B-2.3, Drill Cuttings, page B-2, paragraph 2:

Permittees' Statement: *"The cuttings may be land-applied if they meet the criteria in the NMED - approved notice of intent (NOI) decision tree for land application of investigation derived waste solids from construction of wells and boreholes."*

NMED Comment: *NMED concurs with the use of drill cuttings, which meet the residential SSLs/SALs and land disposal restrictions, for use as overburden, road construction material, and other appropriate uses in accordance with the NOI decision tree. However, the Permittees may not use the drill cuttings to backfill boreholes. The boreholes must be properly plugged and abandoned in accordance with Section X.D of the Order.*

LANL Response

10. Comment noted. The notice of intent does not allow drill cuttings to be used to backfill boreholes. The boreholes will be abandoned in accordance with the requirements of the Compliance Order on Consent.

REFERENCE

LANL (Los Alamos National Laboratory), December 2008. "Delta Prime Site Aggregate Area Phase II Work Plan, Revision 1," Los Alamos National Laboratory document LA-UR-08-7794, Los Alamos, New Mexico. (LANL 2008, 104989)