Response to the Notice of Disapproval for the Corrective Measures Evaluation Report (CME) for Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54, Los Alamos National Laboratory EPA ID No: NM0890010515, HWB-LANL-08-001, Dated May 17, 2010

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. *Some of the files in Appendix G (Cost Estimates) cannot be opened and therefore cannot be reviewed. The only files in Appendix G that could be opened were the Estimate Documentation Reports for all of the alternatives and document 1B.01.B2 (the Remedial Design Phase Technology Cost Detail Report). The Permittees must be sure to provide adequate supporting information and include documentation that supports each of the line item cost estimates similar to what is required for the MDA G CME Report cost estimates. The cost estimates must include unit cost and volume estimates for each line item including hourly rates for personnel and equipment as well as per-unit volume costs for waste management and restoration. For example, waste removal cost estimates must include the cost of excavation, loading, transport, disposal, backfill and compaction as well as unit equipment costs if not included in the cost (per ton or cubic yard) of moving material. The Permittees must provide the Cost Estimate appendices with the revised CME Report; NMED cannot complete its review of the CME Report without these data.*

LANL Response

1. Appendix E of the revised corrective measures evaluation (CME) report includes additional information and documentation (i.e., cost and volumes) to support each of the line items.

NMED Comment

2. *In the Introduction, page 1, paragraph 4, the Permittees state, "[t]he disposal units at Area L are covered with asphalt to house ongoing waste-management activities conducted at Area L. Operations in the north-half of Area L will cease and structures will be decontaminated and decommissioned (D&D) before the closure of MDA L." It is NMED's understanding that many of the operations housed on the north side of MDA L have been moved to the south side. The Permittees must revise the CME Report to update the location of structures as necessary.*

LANL Response

2. Structures 54-0050, 54-0068, 54-0069, 54-0216, and 54-1058 were removed from the north-half of the site, and Figure 2.0-1 has been updated.

NMED Comment

3. *In Section 7.1 (Activities Before Implementation of Corrective Measures), the Permittees state that, "[b]efore any corrective measure is implemented, the surface structures at the site will be removed and foundations and the asphalt pad characterized and also removed. These activities are not part of the CME." The D&D of the surface structures and asphalt pad are in fact integral to the CME and the closure of the surface units must be integrated into the CME schedule for MDA L because the closure of the pit, impoundments, and shafts cannot proceed before these activities occur. Therefore, Section 11.0 (Schedule for Completion of Activities) must be revised to include and account for the closure of the surface units.*

LANL Response

3. Section 7.1 has been revised as follows:

> Before most of the technologies discussed in this CME can be implemented, the Laboratory's Hazardous Waste Permit must be modified to remove existing structures. The structures identified for removal are part of the outdoor hazardous waste container storage unit, Area L (the permitted unit). The northern portion of the permitted unit will be closed in coordination with the CMI for MDA L.
>
> Storage Dome 215 is 60 ft by 266 ft (15,960 ft^2) and is currently used to store clean empty drums for the waste disposition program at Area G. This structure is part of the permitted unit and will undergo D&D before the final remedy for MDA L is implemented.
>
> Storage Pads 36 and 58 are also part of the permitted unit and are located beneath Canopy 62. Each pad is approximately 33 ft by 31.5 ft (1050 ft^2) and has a concrete berm, although neither is currently in use. The canopy provides protection from the weather and will require D&D before the final remedy for MDA L is implemented.
>
> Modifications to the Laboratory's Hazardous Waste Permit will be required before D&D activities can be performed (Class 1 Permit modification with prior approval for structure removal).
>
> Because only the northern-half of the permitted unit will be impacted by the CME process, an additional modification to the Laboratory's Hazardous Waste Permit will be required (Class 2 Permit modification). A revised closure plan and permit modification will be submitted to NMED and will include a request for use of alternative closure requirements in accordance with 40 CFR Section 264.110(c) for the northern-half of the permitted unit to be closed under the CMI for MDA L, thus satisfying the requirements of 40 CFR Part 264, Subpart G. It is expected that the

revised closure plan will include the following activities, to be conducted and documented for the time of final container storage unit closure at Area L:

- structural assessments for Storage Pads 36 and 58 and the asphalt on the northern side of Area L;
- removal of the concrete storage pads, the asphalt pad, plus 6 in. of the underlying soil/base course, and the double-walled holding tank; and
- collection and analysis of soil samples in accordance with the sampling and analysis requirements in the current closure plan.

It is expected that the completion of the Laboratory's Hazardous Waste Permit closure requirements will lead directly to the final action for MDA L.

Groundwater monitoring at the Laboratory is being implemented pursuant to the Consent Order under the IFGMP. As a result, groundwater monitoring is not considered an additional requirement of any corrective measure alternative.

The schedule in section 11 has been updated to reflect the closure of the surface units.

NMED Comment

4. *In Section 5.1.1 (Soil), the Permittees reference NMED's "Technical Background Document for Development of Soil Screening Levels, Revision 4.0" the Permittees must revise this reference and any tables that refer to the values to the updated version, Revision 5.0, August 2009 which is available at NMED's website http://www.nmenv.state.nm.us/hwb/documents/NMED_SSG_ August_2009_Dec09TableA-1_clean.pdf.*

LANL Response

4. The reference has been updated.

NMED Comment

5. *In Section 5.1.2 (Groundwater), the Permittees state that, "[a]s required by NMED in a letter dated April 5, 2007 (NMED 2007, 095394), a "Technical Area 54 Well Evaluation and Network Recommendations" report (LANL 2007, 098548) was submitted to NMED. This report was approved by NMED and requires the Laboratory to install five new regional wells and one new perched-intermediate well around TA-54 during 2008." Even with recent enhancements to the well network at TA-54, the groundwater monitoring system is still inadequate. The Permittees must comply with Section XI.F.6.b and Section VII.D.2 (numbers 4, 5, and 7) of the Order and provide an accurate description of the groundwater conditions beneath MDA L. The This involves four quarters of groundwater data at a minimum from each well (currently R-21, R-38, R-32, R-54, R-56, and R-57), in addition to other items. Additionally, the Permittees must provide updated figures (e.g., Figure 4.2-1 (Locations of existing water-supply wells and regional wells and proposed locations for new wells and water-table contours)) since new wells have been installed since the submittal of the CME.*

LANL Response

5. The document and Figure 2.6-1 are updated to reflect the current monitoring network at Technical Area 54 (TA-54). Regional wells R-20, R-21, R-32, R-38, R-53, R-54, and R-56 form the monitoring network specific to MDA L. Wells R-53, R-54, and R-56 were installed in 2010; therefore, four quarters of groundwater data are not yet available for these newest wells, and to date 2, 3, and 0 rounds of groundwater data, respectively, have been collected. The revised report presents and discusses all available groundwater data and an updated water-table contour map (section 3.2.4 and Appendix D). Note that regional well R-57, located east and downgradient of MDA G, is not included in the discussion of wells specific to MDA L because of its potential to have contamination associated with MDA G.

NMED Comment

6. The Permittees reference incorrect sections of the March 1, 2005 Order on Consent (Order) to describe the criteria for remedial alternatives in Section 5.2 (Consent Order Criteria). Section XI.F of the Order is an outline that provides the format for the CME Report and Section VII.D.4 includes the remedial alternative evaluation criteria. The Permittees must revise Section 5.2 (Consent Order Criteria) to adhere to the criteria detailed in Section VII.D.4 (Remedy Evaluation Criteria) and ensure that the format and content of the CME Report follows Section XI.F (Corrective Measures Evaluation Report) of the Order. The Permittees must assess the Threshold Criteria (Section VII.D.4.a) and the Remedial Alternative Evaluation Criteria (Section VII.D.4.b) to appraise the remedial alternatives for MDA L and make certain that all of the remedial alternatives are equally evaluated using those criteria, similar to what has been done in the MDA G CME Report.

LANL Response

6. Section 5.2 and the screening process discussed in sections 7 and 8 have been revised to follow the criteria in the Compliance Order on Consent (the Consent Order). See also the responses to comments 7, 8, and 11.

NMED Comment

7. NMED is unable to evaluate whether the screening process regarding alternative selection was conducted properly and therefore whether the alternatives were appropriately eliminated or retained alternatives. The Permittees do not provide sufficient detail regarding the remedial alternative selection criteria and the screening process that was utilized to refine the corrective measures alternatives in order to make the final selection. For example, Alternative 3 (Engineered ET Cover, Targeted Waste-Type Stabilization, SVE, Monitoring and Maintenance) is described in Section 7.3.5 and then dismissed as an alternative with no discussion as to why it was dismissed. The Permittees must revise Section 7.4 (Screening of Corrective Measure Alternatives), Section 7.5 (Corrective Measure Alternatives Retained for Evaluation), and Table 7.4-1 (Corrective Measure Alternative Qualitative Screening Matrix) to include more detailed justifications and explanations regarding how the remedial alternatives were measured against the threshold criteria and the remedial alternatives evaluation criteria from Section VII.D.4 of the Order and discuss the rationale for the elimination or retention of all of the alternatives.

LANL Response

7. Section 6 was revised to include a more robust technology-screening process. Potential technologies were evaluated in terms of their applicability for addressing the waste in the pit, impoundments, and shafts as well as vadose zone contamination in the areas next to and between the disposal units. The technologies identified as potentially appropriate for the waste or contamination were carried forward to section 7 for screening against the four threshold criteria identified in the Consent Order. The technologies were screened separately in section 7 for their applicability to the pit and impoundments, the shafts, and the vadose zone. The revised section 7 presents the rationale for retaining or eliminating the technologies based on the threshold screening.

NMED Comment

8. The Permittees have not considered all potential remedies for MDA L. For example, the Permittees have not considered the option of an engineered landfill or a Corrective Action Management Unit (CAMU) to contain or treat on-site excavated waste. Additionally, the Permittees did not consider all permutations of the alternatives. For example the Permittees did not consider ET cover, partial waste excavation, partial waste stabilization, SVE, and the associated monitoring and maintenance as a possible alternative. The Permittees must revise the CME Report to include evaluations of all potential remedial alternatives.

LANL Response

8. Section 6 has been revised to include a broader range of technologies, and sections 7 and 8 have been revised based on the evaluation of individual technologies rather than multiple technologies bundled into alternatives. Furthermore, the individual technologies are evaluated based on their applicability to the waste in the pit and impoundments, the waste in the shafts, and the contamination in the vadose zone next to and between the individual disposal units.

NMED Comment

9. In Section 8.2.4 (Implementability), for alternative 2B (engineered ET cover, SVE, monitoring and maintenance), the Permittees state that "[t]his alternative meets RCRA closure and postcare requirements for the interspersed RCRA units in MDA L." The Permittees have not described how the alternative meets RCRA closure requirements or how the alternative meets post-closure care requirements. The Permittees must revise this section to describe how the alternative meets RCRA closure and post-closure care requirements.

LANL Response

9. In addition to the disposal shafts, Pit A, and Impoundment C that comprise the MDA L corrective action units, the site also contains Resource Conservation and Recovery Act– (RCRA-) regulated units (the Area L landfill, inactive surface Impoundments B and D, and 22 inactive disposal shafts). Closure requirements for these units are regulated by NMED and codified under the New Mexico Administrative Code (NMAC), Title 20, Chapter 4, Part 1 (20.4.1 NMAC), incorporating 40 Code of Federal Regulations (CFR) Part 264 for permitted units and Part 265. These regulations require that closure performance standards minimize the need for further maintenance, control any postclosure escape of hazardous waste or constituents to the extent necessary to protect human health and the environment, and comply with applicable regulatory standards.

Alternative closure for regulated units situated among solid waste management units (SWMUs) subject to certain conditions is allowed under 40 CFR Section 264.110(c). The alternative requirements must be set out in a permit or in an enforceable document. The purpose of alternative closure requirements is to combine RCRA permit closure conditions for groundwater monitoring and the final closure remedy with those in another enforceable document to allow consistent efforts in closure of the units as a whole, where appropriate. The MDA L landfill is collocated among the MDA L corrective action units, and the Consent Order is an enforceable document; therefore, the regulatory requirements to allow alternative closure for these units under the Consent Order are applicable for this facility.

Upon NMED's selection of the remedy for MDA L, the Laboratory will prepare and submit a CMI plan, which will fulfill the requirements for a closure plan and postclosure plan for the regulated units specified in 40 CFR Sections 264.112 and 264.118. The CMI plan will include the requirements for a closure plan as specified in 40 CFR 264.112. The operation and maintenance plan in the CMI plan will include the requirements for postclosure care, as specified in 40 CFR 264.118.

RCRA closure is discussed in section 7.1, and postclosure is discussed in section 8.

NMED Comment

10. *In Section 8.4.2 (Technical Practicability), page 57, regarding alternative 5B (complete waste removal), the Permittees state that "[t]he estimated volume of material, both waste and contaminated overburden, in the ground to be transported is 15,600 yd^3 (11,935 m^3) and does not account for swell after removal. This estimate assumes that 10% of the overburden is contaminated and will be removed with the waste." Then, in Table 7.4-1 (Corrective Measure Alternative Qualitative Screening Matrix), page 164, the Permittees state that "[t]he alternative involves shipment of over 24 mil ft^3 of waste (3.5 mil drum equivalents) via truck to off-site disposal locations." It is not clear how the volume estimates were calculated or why volume estimates in the table increased so much from the amount quoted in the text. The Permittees must describe in detail how volume estimates were calculated for waste removal and ensure that the volume estimates are consistent throughout the revised CME Report.*

LANL Response

10. The proposed excavation layout and volume(s) have been modified to account for site restrictions. New volume estimates are provided in Appendix E. Former Table 7.4.1 and section 8.4.2 have been revised and the values for excavation are now consistent.

NMED Comment

11. *In Section 9.2 (Ranking with CME Selection Criteria), the Permittees state "[i]n Table 9.0-1, criteria 7 to 12, which associated with Section XI.F .11 of the Consent Order, were ranked on a scale of 1 to 5, with 1 having the poorest ability to meet the criteria and 5 most readily meeting the selection criteria." The selection criteria must be based on Section VII.D.4 of the Order; Section XI.F.ll is the format for the CME Report. The Permittees must revise the CME Report to reference the correct section of the Order and ensure that the remedial alternatives were adequately assessed using those criteria. See Comment 6.*

LANL Response

11. Sections 8 and 9 of the CME have been revised completely. The technologies that pass the threshold screening in section 7 are evaluated in section 8 using the remedial alternative evaluation criteria from Section VII.D.4.b of the Consent Order. Section 8.2 includes a crosswalk that identifies where the criteria listed in Consent Order Section XI.F.II are discussed in the revised CME.

NMED Comment

12. The Permittees do not clearly discuss the system used to rank each of the alternatives in Table 9.0-1 (Comparative Analysis of Corrective Measure Alternatives). For example, number 10 (Control Migration of Released Contaminants), alternative 5B (Complete Waste Source Excavation, Backfilling, Off-site Disposal, SVE, Monitoring) is ranked with a 4, while the other alternatives which leave waste in place are ranked higher with a 5. Complete waste removal removes the source of potential release completely; therefore, it is logical to rank it the highest. The Permittees must revise the CME Report text and table to explain how and why each LANL Response alternative was ranked as stated.

LANL Response

12. Table 8.0-2 presents the matrix used in rating the alternatives. Sections 8 and 9 have been revised completely to justify the ranking of the alternatives.

NMED Comment

13. In the Estimate of Periodic and Recurring Costs sections for each alternative, the Permittees do not appear to take into account the monitoring and maintenance of the Soil Vapor Extraction (SVE) systems. If the system runs for 2 months and off for 22 months, the equipment and instruments are likely to need maintenance and the boreholes may need to be cleared of slough. The Permittees must take into consideration the maintenance of the SVE system in the cost estimates for long-term monitoring and maintenance and include such costs in the line items in the Cost Estimate (see Comment 1).

LANL Response

13. Soil-vapor extraction (SVE) costs have been revised to account for both monitoring and maintenance activities necessary during the proposed 3 yr of active SVE. The revised costs are discussed and summarized in section 8.0. Supporting information for the revised costs estimates are provided in Appendix E.

NMED Comment

14. In Section 8.0 (Evaluation of Corrective Measure Alternatives), the section describing alternative 5A is not presented in the same manner as the other alternatives. The Permittees must revise Section 8.3 (Alternative 5A: Engineered ET Cover, Partial Excavation, SVE, and Monitoring and Maintenance) to have the same format as the other sections that describe the remediation alternatives (i.e., detailed description of alternative, applicability, technical practicability, effectiveness, implementability, human health and ecological protectiveness, and cost).

LANL Response

14. Section 8 has been revised completely, as discussed in the responses to Comments 11 and 12 above, to present a consistent discussion of the evaluation.

NMED Comment

15. In Section 9.0 (Selection of the Preferred Corrective Measure Alternative), page 61, the Permittees list alternatives 2B, 2C, lB, and 5B as the alternatives that were selected; however, the actual alternatives are 1B, 2B, 5A and 5B. The Permittees must revise this paragraph to list the correct alternatives.

LANL Response

15. Section 9 has been revised. The list of alternatives has also been revised and renumbered in the report.

NMED Comment

16. In Appendix H (Proposed Long-Term Subsurface Vapor Monitoring Plan for Material Disposal Area L at Technical Area 54), Section H-4.0 (Monitoring Distribution and Frequency) page H-2, the Permittees state that "[t]o identify any new release of VOCs from the disposal units, vapor samples will be collected quarterly using a B&K multigas monitor from the four boreholes installed during the Phase I Resource Conservation and Recovery Act facility investigation. The field screening will be used to test VOC concentrations for four primary contaminants that are present at 10 different depths using a [Flexible Liner Underground Technology] FLUTe, or equivalent, multilevel sampling locations in the borehole. Four SUMMA canisters will be used to verify concentrations at the four highest sampling locations. Samples will be collected daily during operation of the SVE system during the 2-months-on and 22-months-off intermittent operation." It is not clear what the length of time will be for quarterly vapor monitoring (e.g., 30 years, 45 years, or 100 years) and reporting. It is also not clear why the Permittees will only sample from the four highest sampling locations. Additionally, the Permittees must periodically assess whether or not the 2 months on and 22 months off cycle of the SVE system is effective at removing VOCs and propose to adjust the cycle as needed. The removal of the asphalt from the surface of MDA L may affect the SVE system (removing a vapor, moisture, infiltration barrier) compared to the pilot test. The Permittees must inform NMED of any changes to the vapor monitoring data (i.e., if it becomes apparent the plume is growing) within two weeks of the change and the data must also be discussed in the annual vapor monitoring report submitted to NMED. The Permittees must revise the CME Report to address the issues discussed above.

LANL Response

16. The pore-gas monitoring strategy described in Appendix F, Proposed Long-Term Subsurface Vapor-Monitoring Plan for Material Disposal Area L at Technical Area 54, has been revised. The purpose of pore-gas monitoring is to assess the effectiveness of SVE and to identify any potential new releases of VOCs from the disposal units.

    During the proposed 3 yr of active SVE (years 1 through 3), pore-gas monitoring will be conducted twice per year at all monitoring borehole locations within 100 ft of each disposal unit: once before active extraction, and once after active extraction. Pore-gas monitoring will be conducted once per year at all remaining monitoring borehole locations more than 100 ft from each disposal unit during

this time. Following the proposed 3 yr of active SVE (years 4 through 30), pore-gas monitoring will be conducted once per year at all monitoring borehole locations within 100 ft of each disposal unit and at each extraction borehole. Pore-gas monitoring will be conducted once every 2 yr at all remaining monitoring borehole locations more than 100 ft from each disposal unit. Every port in each monitoring borehole (versus select sample ports) will be sampled during each monitoring event in accordance with Consent Order requirements. Monitoring frequencies may be increased if volatile organic compound (VOC) concentrations are determined to be increasing during the 30-yr monitoring period.

The proposed monitoring frequency will allow the Laboratory to evaluate the performance of the SVE as well as to determine whether a release has occurred at any of the disposal units. The Laboratory will report the results of all monitoring activities to NMED in an annual monitoring report and will work in collaboration with NMED to determine an appropriate and revised (if necessary) monitoring frequency if VOC concentrations are found to be increasing during the 30-yr monitoring period. The Laboratory will notify NMED if changes in monitoring data indicate changes in the nature and extent of subsurface contaminants. The Permittees will work in collaboration with NMED to establish adequate SVE performance criteria (i.e., specific reduction in vapor-phase VOC concentrations) and whether those standards have been met following active SVE. SVE performance standards and criteria for revising pore-gas monitoring frequency and reporting requirements will be documented in the CMI plan.

NMED Comment

17. *In Appendix F (Soil Vapor Extraction Pilot Test at Technical Area 54, Material Disposal Area L: Numerical Modeling in Support of Decision Analysis) the Permittees state in Section 4 (Conclusions) that "[s]ome questions developed during the calibration of the manometer data suggest that the FLUTe system in surrounding boreholes may be leaking, especially during the high suction of the SVE test. This may in turn explain the extremely rapid drops in concentration at all depths in several of the monitoring wells." The Permittees must propose to install permanent vapor monitoring wells at MDA L to replace the potentially leaky FLUTe systems. The permanent vapor monitoring wells must have ports installed at depths that are the same as the ports currently monitored with the FLUTe system. The work plan to install the permanent vapor monitoring wells must be included in the Corrective Measures Implementation (CMI) Plan.*

LANL Response

17. The Laboratory proposes to replace the six existing pore-gas monitoring boreholes constructed with the FLUTe monitoring system (locations 54-24238, 54-24239, 54-24240, 54-24241, 54-24242, and 54-24243) with five new pore-gas monitoring boreholes constructed with dedicated stainless-steel sampling systems. Four of the proposed new monitoring boreholes will be constructed next to and within approximately 50 ft of the eastern disposal shaft field and the pit and impoundments. The fifth proposed new monitoring borehole will be installed next to the western disposal shaft field. All new proposed pore-gas monitoring boreholes will have sampling ports installed in the stratigraphic units and at depths currently monitored with the FLUTe-constructed monitoring boreholes The Laboratory will include the work plan to install the new pore-gas monitoring wells in the CMI plan.

NMED Comment

18. *In Section 10.4 (Additional Engineering Data Required), the Permittees list that before the CMI design is complete, additional data will be needed; this includes the verification of the existing depths to the top of waste in each unit. The Permittees must describe the methods and procedure for collecting this data (e.g., geoprobe, shovel, ground penetrating radar) in the revised CME Report.*

LANL Response

18. The text in section 10.4 has been revised to state that ground-penetrating radar will be used to determine the locations and depths to the top of the pit, impoundments, and shafts.

NMED Comment

19. *The Permittees do not discuss air monitoring in the CME Report. In the CME Work Plan, the Permittees state that an air-monitoring program will be evaluated in the CME for the containment and no further action alternatives. The Permittees must revise the CME Report to discuss both the need and methods for air monitoring.*

LANL Response

19. The conceptual site model discussed in section 4 indicates that risk via the inhalation pathway is very low; therefore, no air-monitoring is needed for the alternatives.

NMED Comment

20. *The schedule (Section 11 (Schedule for Completion of Activities)) must be adjusted. For instance, the Public Involvement Plan (from 2007) must be updated and be included in the schedule. Additionally, statements such as "[t]he Laboratory will complete the remedy by March 31, 2012" must also be revised to reflect a more realistic schedule.*

LANL Response

20. The schedule presented in section 11 has been updated.

SPECIFIC COMMENTS

NMED Comment

1. Section 6.1.1.2 (Deep Subsurface Horizontal Barriers), page 25:

Permittees' Statement: *"The purpose of a horizontal barrier is typically to contain downward aqueous-phase contaminant transport. Such a barrier is suitable for sites with known aqueous-phase releases or with significant infiltration from the surface. These conditions do not exist at MDA L. Therefore, a deep horizontal barrier would not be appropriate for addressing the release and transport pathways of potential concern at MDA L; thus, technologies in this category were not considered further in this CME."*

NMED Comment: *There are known aqueous phase releases at MDA L; in Section 2.1 (Site History), the Permittees state, "Area L operated from the early 1960s to 1986 as the designated disposal area for nonradiological liquid chemical wastes, including containerized and uncontainerized liquid wastes; bulk quantities of treated aqueous waste; batch-treated salt solutions and electroplating wastes, including precipitated heavy metals; and small-batch quantities of treated lithium hydride." If the waste is left in place, the Permittees must consider all possible technologies that will be protective of human health and the environment. The Permittees must consider horizontal barriers for use as a remedial alternative at MDA L.*

LANL Response

1. Horizontal barriers are evaluated in section 6.2 of the revised CME report.

NMED Comment

2. Section 6.1.1.4 (Surface Barriers), page 27:

Permittees' Statement: *"ET covers are designed to provide infiltration protection for arid environments, where materials such as clays and synthetic/geosynthetic membranes are less reliable. ET covers can consist of a single vegetated soil layer or can be designed with multiple layers of geologic materials suited to achieve the ET criteria necessary. Suitable vegetation is a significant component for most ET covers, to aid in the dewatering of the cover material(s). The vegetated ET cover was developed specifically for landfills located in arid and semiarid environments like Los Alamos (Barnes et al. 1990, 070209, pp. 1201–1202). The earliest research in this area was conducted at Los Alamos, at a test site within 1 mi of MDA L (Nyhan et al. 1984,008797; Nyhan 1989, 006876; Nyhan et al. 1989,006874). Cover system design guidance has also been developed that provides requirements and considerations for design of cover systems at the Laboratory (ITRC 2003, 091330; Daniel B. Stephens & Associates Inc. 2005, 089548). An engineered ET cover would enhance the existing MDA L cover. The technology was retained."*

NMED Comment: *ET covers perform well in arid and semi-arid climates; however, Los Alamos is located in a wetter environment (northern NM gets about twice the amount of annual precipitation as southern NM for comparison) and snow is especially detrimental to ET covers. ET covers are also proven to leak. Additionally, an ET cover may not comply with the RCRA post-closure requirements for impoundments B and D and shafts 1, 13-17, and 19-34. Because the Permittees propose an ET cover as a remedial alternative at MDA L, the Permittees must propose to conduct vapor moisture monitoring. Additionally, the Permittees must describe how the ET cover meets the RCRA closure/post-closure care requirements.*

LANL Response

2. The ET cover meets the RCRA closure/postclosure care requirements:

    a. The MDA L site is ideal for a vegetative cover. Prescriptive RCRA covers that depend on geosynthetics cannot be used effectively for sites such as MDA L because the geosynthetics will not last as long as the waste poses a significant risk, nor will they meet the 30-yr monitoring and 100-yr maintenance periods. Additionally, the climate's demand for water or potential ET far exceeds the actual supply of water (precipitation), as shown in Figure 2.2-3 of the revised CME.

b. In addition to the disposal shafts, Pit A and Impoundment C that comprise the MDA L corrective action units, the site contains RCRA-regulated units (the Area L landfill, inactive surface Impoundments B and D, and 22 inactive disposal shafts). Closure requirements for these units are regulated by NMED and codified under 20.4.1 NMAC, incorporating 40 CFR Part 264. These regulations require that closure performance standards minimize the need for further maintenance, control any postclosure escape of hazardous waste or constituents to the extent necessary to protect human health and the environment, and comply with applicable regulatory standards.

   Alternative closure for regulated units situated among SWMUs subject to certain conditions is allowed under 40 CFR Section 264.110(c). The alternative requirements must be set out in a permit or in an enforceable document. The purpose of alternative closure requirements is to combine RCRA permit closure conditions for groundwater monitoring and the final closure remedy with those in another enforceable document to allow consistent efforts in closure of the units as a whole, where appropriate. The MDA L landfill is collocated among the corrective action units of MDA L, and the Consent Order is an enforceable document; therefore, the regulatory requirements to allow alternative closure for these units under the Consent Order are applicable for this facility.

   Upon NMED's selection of the remedy for MDA L, the Laboratory will prepare and submit a CMI plan, which will fulfill the requirements for a closure plan and postclosure plan for the regulated units specified in 40 CFR Sections 264.112 and 264.118. The CMI plan will include the requirements for a closure plan as specified in 40 CFR 264.112. The operation and maintenance plan in the CMI plan will include the requirements for postclosure care, as specified in 40 CFR 264.118.

c. Moisture monitoring is proposed for the cover.

NMED Comment

3. Section 6.1.3.3 (Bulk Waste Retrieval (Partial Waste Excavation)), page 31:

Permittees' Statement: *"Waste in surface impoundments at MDA L can be removed using large-scale soil moving and excavating equipment and containerization tools. The waste characterization analysis of the samples collected from the former surface impoundments (LANL 2007, 096409, Appendix E) identified the material in the impoundments as hazardous waste. Current overburden will be removed and the waste excavated and stored in new waste containers, directed for waste treatment and/or for off-site disposal. The analysis of the inventory data of the waste in Pit A indicates that no path forward is available for disposal of many of the waste items. This technology was retained for further consideration for the impoundments."*

NMED Comment: *The Permittees must explain the reasons why disposal options are not available for the waste in Pit A and offer alternatives to deal with the waste in Pit A in the revised CME Report.*

LANL Response

3. Sections 8 and 9 have been revised. Excavation of Pit A has been determined to be a viable option.

NMED Comment

4. Section 10.3.1 (Long-Term Monitoring Requirements), page 66:

Permittees' Statement: *"Groundwater monitoring of the regional aquifer beneath MDA L will be consolidated with the Laboratory-wide groundwater-monitoring program. One new groundwater well is proposed to be installed at a location near the MDA L site. VOCs will be monitored for 30 yr in the selected boreholes on site or until NMED determines that monitoring is not necessary. Tritium will be monitored in the subsurface until DOE determines that no future potential risk exists. Additional monitoring will be performed for contaminants in dust and sediment in surface water runoff."*

NMED Comment: *The wells that will be included specifically for MDA L monitoring have not been identified. The Permittees must revise the groundwater monitoring section to discuss any updates to the groundwater monitoring network since January 2008 in greater detail, including any proposed additional well locations.*

LANL Response

4. Section 2.6 describes the overall monitoring well network for TA-54 and identifies regional wells R-20, R-21, R-32, R-38, R-53, R-54, and R-56, as specific to MDA L. Table D-3.0-1 in Appendix D summarizes the installation dates of these wells and the number of available groundwater samples as of September 2010. No new wells are currently proposed for MDA L.

NMED Comment

5. Appendix G (Supporting Information for Cost Estimates), page G-14

Permittees' Statement: *"For the area with Pit A, Impoundments B through D, and Shafts 1 through 28, the excavation depth of the adjacent tuff would vary. All shafts in this area are 60 ft deep; therefore, this depth would be the minimum excavation depth immediately around the shafts. All the impoundments are 10 ft deep and Pit A is 12 ft deep. In excavating the shafts and keeping the minimum 1.5:1 side slope, the majority of the impoundments and pit would also be excavated. Again, shoring may be necessary to avoid the existing structures along the south of the buried waste in this area. The following volumes assume that these facilities cannot be disturbed. The footprint of the excavation would consist of two rectangular areas to avoid the southern facilities. The first would run along the top of the buried waste and measure approximately 400 ft × 140 ft at the ground surface. The second would begin at about Shaft 19 and measure approximately 230 ft × 80 ft. From this footprint, 2530 yd3 of waste would be removed. This volume includes the 3-ft-deep concrete plug at the top of each shaft. The remaining volume of the excavation would be approximately 88,660 yd3 of overburden. Assuming that 10% of this overburden is contaminated and combining that number with the volume of waste, approximately 11,400 yd3 of material would need to be removed from this area.*

NMED Comment: *The surface structures at MDA L must be removed before work begins. It is unclear which structures will remain at MDA L that makes shoring of excavation of the trenches necessary. The Permittees must revise the CME Report to discuss structures that will remain standing at MDA L, the structures that will be demolished, and how the presence of any structures on site affects the various alternatives (i.e., shoring is necessary for safety versus to maintain the structural integrity of existing buildings).*

LANL Response

5. The surface structures and asphalt at MDA L will be removed as part of RCRA closure, as discussed in section 7.1, before the final remedy is implemented (see response to General Comment 3).

NMED Comment

6. Appendix G (Supporting Information for Cost Estimates), page G-14, paragraph 5

Permittees Statement: *"The horizontal extent of contamination was assumed to not extend beyond the edges of the shafts and pits. The vertical extent of contaminants was assumed to be bottom of the shafts and pits. The estimated volume of contaminated soil is presented in Table G-7.3-1."*

NMED Comment: *The Permittees cannot assume that the vertical extent of contamination ends at the bottom of the pits since VOCs were detected in tuff samples at depths greater than 100 feet below ground surface. The Permittees must be conservative in their soil removal cost estimates. Following confirmation sampling which must be proposed in the revised CME Report, additional contaminated soil/tuff excavation may be required and must be incorporated into the cost estimates. The Permittees must revise the CME Report to propose confirmation sampling for any alternative that includes excavation.*

LANL Response

6. The horizontal extent of contamination mentioned in the report refers to the nonvapor-phase contamination that would require excavation. The extent of vapor-phase contamination is greater but would not be addressed by excavation. The cost estimates in section 8 have been revised to include confirmation sampling.