

**Response to the Notice of Disapproval for the Investigation Report for North Ancho Canyon  
Aggregate Area, Los Alamos National Laboratory (LANL),  
EPA ID #NM0890010515, HWB-LANL-09-052,  
Dated November 4, 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.

**GENERAL COMMENTS**

**NMED Comment**

1. *To facilitate NMED's review of the Report, to eliminate discrepancies, and to ensure that, in the future, investigation reports submitted to NMED comply with Section XI.C of the March 1, 2005 Order on Consent (Order), NMED directs the Permittees to incorporate the information in Appendix B (Data Review) of the Report, into the appropriate sections of the main text. For example, the entirety of Section B-2.1 (SWMU 39-002(a) Area 1) in Appendix B must be included in Section 5.3.5 (Spatial Distribution of COPCs at SWMU 39-002(a) Area 1) of the main text of the Report.*

**LANL Response**

1. Text from Appendix B on the identification of chemicals of potential concern (COPCs) and discussions of the nature and extent of the COPCs for each site have been incorporated into section 5 of the main text. Appendix B now contains only the box plots constructed as part of the COPC identification and the tables presenting the results of the statistical tests used in this process. Future investigation reports will be organized in the format requested by NMED.

**NMED Comment**

2. *In an effort to determine the source of water in the 15 existing angled boreholes at solid waste management units (SWMU) 39-001(a) and 39-001(b), NMED directed the Permittees to "attempt removing (intact) the PVC in a few of the angled boreholes so that the actual construction of the "wells" could be evaluated" (Email from NMED to the Permittees dated June 2, 2009). Furthermore, in an email dated July 30, 2009, NMED instructed the Permittees to provide justification in the investigation report for why the 80-feet of PVC pipe, specifically in borehole ASC-3, could not be removed.*

*The Permittees have not provided any information regarding the angled boreholes (e.g., were they removed, plugged and abandoned). Additionally, the angled boreholes (DM-4, ASC-0, ASC-2, ASC-3, ASC-4, DM-6, ASC-11, ASC-12, ASC-13, ASC-14, ASC-15, ASC-16, ASC-17, ASC-18, and ASC-19) are not depicted on any figures in the Report (e.g., Figure 3.2-1). The Permittees must revise the Report to include a discussion of the status of these 15 boreholes as well as revise all figures to include their locations.*

## LANL Response

2. This comment was discussed by the Permittees and NMED during a meeting held at NMED on November 18, 2009. The Permittees explained the approved work plan provided no scope for removing the angled boreholes at Solid Waste Management Units (SWMUs) 39-001(a) and 39-001(b). NMED requested that the Permittees provide any available information on the construction of these boreholes. Per NMED's request, all information gathered on these boreholes, including a recently drafted figure, will be sent to NMED under separate cover by January 29, 2010.

The 80 ft of polyvinyl chloride (PVC) pipe in borehole ASC-3—the borehole damaged during excavation activities at SWMU 39-001(a)—could not be removed. During the attempt to pull out the remaining piece of buried pipe with a backhoe, the PVC pipe broke as it was being removed.

Final disposition of all angled boreholes and shallow wells at Technical Area 39 will be addressed in the Phase II work plan, to be submitted by December 31, 2010.

## SPECIFIC COMMENTS

### NMED Comment

1. *Executive Summary, page v, paragraph 4:*

**Permittees' Statement:** "Phase II remediation activities at SWMU 39-001(a) are ongoing, and an addendum to this investigation report will be submitted when they are completed."

**NMED Comments:** The Permittees did not request an extension to complete remediation activities at SWMU 39-001(a), nor did they contact NMED to discuss the deviation from the approved Work Plan. The Permittees should have included SWMU 39-001(a) in the Permittees' recommendations for a second phase of field work. The Permittees are reminded that this additional remediation work was not included in the scope of work in the approved Work Plan. The Permittees must submit a work plan for the additional remediation activities at SWMU 39-001(a) no later than December 30, 2009.

### LANL Response

1. This comment was discussed by the Permittees and NMED during a meeting held at NMED on November 18, 2009. The Permittees explained that the additional soil removal referred to in the comment had been completed, and no further remediation activities were required. NMED agreed that a work plan for additional remediation activities at SWMU 39-001(a) was not required. This decision was documented in the extension request letter submitted to NMED on November 25, 2009, and NMED's approval letter dated December 2, 2009.

### NMED Comment

2. *Section 2.8 Field Screening for Metals by X-Ray Fluorescence, page 6, paragraph 2:*

**Permittees' Statement:** "Because the XRF results are not directly comparable to analytical background values (BV), the samples with the highest 25% of detected concentrations were selected for off-site laboratory analysis based on historical chemicals of potential concern (COPCs) (if available), on operational processes, expected COPCs, or the most elevated concentrations above BV."

**NMED Comment:** Section 5.1.2.3, *Metals Field Screening*, of the approved Work Plan states only that “[a]n elevated detection for XRF analysis is defined as an instrument reading that exceeds 2 times the background value of the sample matrix,” not a percentage of samples with the highest detected concentrations. The Permittees must provide justification for this deviation or for the selection of a certain percentage of samples.

#### **LANL Response**

2. Because of the differences between x-ray fluorescence (XRF) and the laboratory methods used to establish background values (BVs), XRF measurements will always be higher than BV. The criterion of 2 times background specified in the work plan to account for this effect proved overly conservative and was not useful in identifying samples for laboratory analysis. Therefore, an alternate criterion based on samples with the highest 25% of readings was used. The choice of 25% was deemed to be sufficiently biased to indicate potential contamination at a site. Text clarifying this approach has been added to the discussion of XRF in sections 2.8 and 2.10.2.

#### **NMED Comment**

3. **Section 2.10.2, Deviations, SWMU 39-002(a) Area 1, page 7:**

**NMED Comment:** Table 4.0-1 of the Work Plan states that samples will be obtained from three depth intervals below the ground surface at each sampling location at SWMU 39-002(a) Area 1: 0-1.0 foot, 1.0-2.0 feet, and 2.0-3.0 feet. The Report indicates that in some instances, all three samples were not collected at each sampling location (e.g., sampling locations 39-01491, 39-01493, 39-01494). The Permittees must revise the Report to explain why these required samples were not collected.

#### **LANL Response**

3. The sampling locations listed in NMED's comment and all sampling locations with the designation 39-01xxx were collected in 1997 (designated in the sample number as xxxx-97-xxxx). The approved work plan did not propose resampling historical sampling locations at any depths. All samples collected during the 2009 investigation of SWMU 39-002(a) Area 1 were from the three depths specified in Table 4.0-1 of the work plan, with the exceptions noted in the deviation section of the report (section 2.10.2, p. 7). Therefore, samples do not need to be collected at the locations listed, and no revision to the report is warranted.

#### **NMED Comment**

4. **Section 2.10.11, SWMU 39-004(d), page 8:**

**Permittees' Statement:** “Samples collected at SWMU 39-004(d) for analysis of dioxins/furans were not submitted for analysis. The radiological activity of these samples exceeded the criteria for acceptance by the off-site laboratory conducting dioxin/furans analysis.”

**NMED Comment:** The Permittees state that “[n]ature and extent are not defined for the three active firing sites [SWMUs 39-004(c), 39-004(d), and 39-008], but the results of the preliminary characterization indicated that contaminants are not migrating off-site from these SWMUs.” The samples at 39-004(d) were not submitted for dioxin/furan analysis; therefore, the Permittees cannot definitively state that no contaminants are migrating off-site. The Permittees must revise the Report to state that it is unknown whether or not current operations at the firing site contribute to off-site

migration of dioxins/furans. Extended drainage sampling confirmed that other contaminants are not migrating off-site and the South Canyons investigations will address any contaminants that migrate from the site.

#### **LANL Response**

4. The text in sections 5.12.4.2 and 5.12.4.4 has been revised to state it is not known if dioxins/furans are migrating from SWMU 39-004(d). However, data for the extended drainages (sections 5.19.5.2 and 5.19.5.4) indicate dioxins/furans from all of the sources are not migrating beyond the aggregate area boundary.

#### **NMED Comment**

**5. Section 3.2.1.3, Type of Materials Excavated, page 11:**

**Permittees' Statement:** "An additional 2 ft of material was excavated beneath the impacted decision units, and further confirmation sampling was conducted. Analytical results for these samples have not yet been received"

**NMED Comment:** See Specific Comment # 1.

#### **LANL Response**

5. See the response to Specific Comment 1. The additional remediation and confirmatory sampling at SWMU 39-001(a) have been completed, and the revised investigation report includes these results. The text, tables, figures, risk calculations, and the data DVDs have been revised to incorporate the additional analyses, sampling results, and recommendations for this site.

#### **NMED Comment**

**6. Section 3.2.3.1, SWMU 39-006(a), Site Description, Seepage Pit, page 13, paragraph 2:**

**Permittees' Statement:** "The pit consisted of large cobblestones mixed with sandy loam. It was excavated using the tracked excavator, and the contents were piled and sampled separately from any other waste. Figure 3.2-6 shows the final excavation boundaries and sampling locations."

**NMED Comment:** Figure 3.2-6 does not show sampling locations. The Permittees must revise Figure 3.2-6 to include the sampling locations.

#### **LANL Response**

6. The text in section 3.2.3.1 has been revised to refer only to Figure 3.2-6, which shows the final excavation boundaries for SWMU 39-006(a). The sampling locations are discussed as part of the site background and contamination discussion for this SWMU in section 5.22, and the locations are shown in Figure 5.22-2.

#### **NMED Comment**

**7. Section 3.6, Excavation Backfilling, page 14, paragraph 2:**

**Permittees' Statement:** "Stockpile 3, composed of sand filter material from SWMU 39-006(a), was placed into the sand filter excavation. It was spread and compacted along the entire floor to a height of approximately 3 ft."

**NMED Comment:** The Permittees must revise the Report to provide additional information regarding the type of material (e.g., soil, sand filter components, contaminants) that was placed in the excavation at SWMU 39-006(a). The Permittees are allowed to return overburden material only to excavations as backfill, with the condition that the overburden meets residential SSLs/SALs.

#### **LANL Response**

7. The text has been revised to indicate that Stockpile 3 was composed of overburden sand from the sand filter excavation. The overburden was screened against residential soil screening levels (SSLs)/screening action levels (SALs), and only overburden below the residential SSLs/SALs was returned to the excavation, as stated in the first paragraph of section 3.6.

#### **NMED Comment**

**8. Section 4.3, Ecological Screening Levels, page 16:**

**Permittees' Statement:** "All of the sites, except for the active firing site [SWMUs 39-004(c), 39-004(d), and 39-008] and SWMUs 39-001(a), 39-001(b), and 39-002(b) were evaluated for potential ecological risk."

**NMED Comment:** The Permittees did not provide an explanation in the Report. The Permittees must revise this Section to include explanations of why ecological risk screenings were not conducted at SWMUs 39-004(c), 39-004(d), and 39-008, 39-001(a), 39-001(b), and 39-002(b).

#### **LANL Response**

8. Upon further review of the text in section 4.3, LANL has determined this information is not relevant for the regulatory criteria section and the text has been deleted from section 4.3. The sections summarizing the human health and ecological risk assessment results explain why ecological risk screenings were not conducted at SWMUs 39-004(c), 39-004(d), 39-008, 39-001(a), 39-001(b), and 39-002(b).

#### **NMED Comment**

**9. Section 6.1, Conclusions, Summary of Remediation Activities, page 52:**

**Permittees' Statement:** "At SWMU 39-001(a), the remediation activities in the work plan were completed and confirmation sampling demonstrated that cleanup levels were exceeded for Aroclor-1242. Therefore, a second phase of remediation was implemented and is being completed, requiring submittal of an addendum at a future date"

**NMED Comment:** See Specific Comment # 1.

#### **LANL Response**

9. See the response to Specific Comment 1. The additional remediation and sampling have been completed at SWMU 39-001(a), and the revised investigation report summarizes the remediation activities and includes the sampling results for this site.

#### **NMED Comment**

**10. Section 7.1, Recommendations, Sites Recommended for Corrective Action Complete without Controls, page 54:**

**NMED Comment:** *The Permittees have requested certificates of completion for SWMUs 39-001(b) and 39-005 and Areas of Concern (AOC) 39-002(c), 39-002(d), 39-002(e) 39-002(f), and 39-007(d). NMED concurs that the nature and extent of contamination has been defined at the aforementioned SWMUs and AOCs. To facilitate the review process and for administrative completeness, the Permittees must submit their request for Certificates of Completion under separate cover.*

#### **LANL Response**

10. LANL will request certificates of completion for these SWMUs and areas of concern under separate cover.

#### **NMED Comment**

**11. Section 7.2, Recommendations, Sites Recommended for Additional Characterization or Remediation, page 54:**

**Permittees' Statement:** *"Based on the results of the North Ancho Canyon Aggregate Area investigation, five sites are recommended for additional characterization or remediation."*

**NMED Comment:** *NMED concurs that additional characterization and/or remediation is required at SWMU 39-002(a) Area 1, SWMU 39-002(a) Area 2, SWMU 39-007(a), SWMU 39-006(a), AOC 39-002(b), and SWMU 39-001(a); however, the Permittees did not propose a schedule for submittal of a Phase II Investigation Work Plan. The Permittees must revise the Report to include a section that addresses the proposed schedule for submittal of a Phase II Investigation Work Plan.*

#### **LANL Response**

11. In section 7.2, LANL proposes a revised schedule to submit the Phase II investigation work plan for the North Ancho Canyon Aggregate Area.

#### **NMED Comment**

**12. Appendix B, Section B-2.16.5.4, Summary of Extent at SWMU 39-001(a), page B-62:**

**Permittees' Statement:** *After an evaluation of the extent of SWMU 39-001(a), the following issues remain:*

- *Vertical extent is not defined for mercury and uranium at some locations.*
- *Vertical extent is not defined for uranium-238 at one location."*

**NMED Comment:** *The statement suggests that extent is not defined for mercury, uranium, and uranium-238. However, Sections 6.1 (Summary of Remediation Activities) and 3.2.1.3 (Type of Materials Excavated) suggest that cleanup standards were exceeded for Aroclor-1242 only, necessitating additional remediation. The Permittees must revise the Report to resolve this discrepancy. Also See General Comment # 1.*

#### **LANL Response**

12. The cleanup levels established for SWMU 39-001(a) in the investigation work plan were the industrial SSLs. All of the COPCs had concentrations below the cleanup levels and below the NMED and U.S. Department of Energy target levels, but extent has not been defined for several COPCs. Although the maximum detected concentration of mercury (1.3 mg/kg) is much lower than the industrial SSL of 310 mg/kg, the vertical extent for mercury is not defined at two locations. Uranium was detected above its BV at two locations in the deepest interval sampled. A reevaluation of uranium found the concentrations were less than, or similar to, the maximum soil background concentration (3.6 mg/kg) and less than the industrial SSL of 3410 mg/kg. Therefore, the vertical extent of uranium is defined at SWMU 39-001(a). Uranium-238 was detected above the soil BV at one location in the deepest interval sampled, but the concentration is below the industrial SAL of 430 pCi/g. In addition, the vertical extent of Aroclor-1242 and Aroclor-1254 is not defined although the concentrations are below the industrial SSL of 8.26 mg/kg based on the additional confirmation samples collected. The text in sections 6.1 and 6.2 has been revised to clarify why the cleanup levels are met although the extent of some COPCs has not been defined. In addition, the text in section 3.2.1.3 has been revised to explain the excavation process for remediating Aroclor-1242 at one location.

#### **NMED Comment**

##### **13. Summary Tables:**

**NMED Comment:** *The Permittees must include the residential soil screening levels (SSLs)/screening action levels (SALs) and the industrial SSLs/SALs in each of the summary tables for each SWMU/AOC for comparison purposes, (e.g., Tables 5.3-2, 5.3-3, and 5.3-4). The Permittees must revise each of the summary tables to include this information.*

#### **LANL Response**

13. The residential and industrial SSLs/SALs have been added to the data summary tables for each site, except for the extended drainages. The residential and recreational SSLs/SALs were added to the tables for the extended drainages

**Cross-Reference of NMED NOD Comments and Revisions to North Ancho Canyon Aggregate Area Investigation Report, Revision 1**

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s)/Page(s) in Original Report	Section(s)/Page(s) in Revised Report	Nature of Revision
<b>General Comments</b>				
1	Incorporate information in Appendix B (Data Review) into the appropriate sections of the main text.	Section 5 and Appendix B	Section 5 (throughout) and Appendix B	Sections 5.3 and 5.4 were revised; subsequent sections were renumbered; the main text has been revised to include descriptions from Appendix B of the identification of chemicals of potential concern (COPCs) and detailed discussions of nature and extent. Appendix B now only includes box plots and tables presenting the results of statistical comparisons to background.
2	Add a discussion to the report of the status of the 15 angled boreholes and revise all figures to show locations of boreholes.  Provide justification for why the 80 ft of polyvinyl chloride pipe, specifically in borehole ASC-3, could not be removed.	Sections 3.5 and 5.20	n/a*	As discussed with NMED, the approved work plan provided no scope for removing the angled boreholes at Solid Waste Management Units (SWMUs) 39-001(a) and 39-001(b). Available information, including a recently drafted figure, will be sent to NMED under separate cover in January 2010. All the angled boreholes and shallow wells at Technical Area 39 will be addressed in the Phase II work plan for this project, to be submitted by December 31, 2010.  The attempt to pull out the remaining piece of buried pipe with a backhoe failed when the PVC pipe broke as it was being removed. Other approaches were deemed to be impractical.
<b>Specific Comments</b>				
1	Submit a work plan for additional remediation activities at SWMU 39-001(a) by December 30, 2009.	Executive Summary, p. v, paragraph 4	n/a	Remediation and sampling at SWMU 39-001(a) is complete and, as agreed to with NMED, no work plan is required. No revision to the report is needed in response to this comment.

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s)/Page(s) in Original Report	Section(s)/Page(s) in Revised Report	Nature of Revision
2	Provide justification for use of highest 25% of x-ray fluorescence (XRF) readings for selecting samples instead of all XRF exceeding BV.	Section 2.8	Sections 2.8 and 2.10	Text has been added to provide the rationale for use of highest 25% readings using XRF.
3	Revise section to explain why samples were not collected at the required depth intervals at each sampling location within SWMU 39-002(a) Area 1.	Section 2.10.2, p. 7	n/a	The sampling locations listed in the comment were collected in 1997. The approved work plan did not propose to resample historical sampling locations at any depths. Therefore, no revision to the report is warranted.
4	Revise the report to state that it is unknown if current operations are contributing to off-site migration of dioxins/furans at SWMU 39-004(d).	Section 2.10.11, p. 8	Sections 5.12.4.2 and 5.12.4.4	Text has been revised to state that it is unknown if there is off-site migration of dioxins/furans from SWMU 39-004(d).
5	Submit a work plan for additional remediation activities at SWMU 39-001(a) by December 30, 2009.	Section 3.2.1.3, p. 11	Text in sections 3.2.1.3, 5.20, 6.1, 6.3, 7.2. H-4.2.14, H-4.4.11, H-5.3.14, H-5.4.4, H-5.4.6, H-5.5.1.4, and Attachment H-3  Figures 5.20-1, 5.20-2, 5.20-3, and 5.20-4  Tables 5.20-1, 5.20-2, 5.20-3, 5.20-4, 5.20-5; H-2.3-21, H-2.3-22, H-4.2-51, H-4.2-52, H-4.2-53, H-5.3-22, H-5.3-23, H-5.4-11, and H-5.4-23  Appendix F data files on DVD	Remediation and sampling at SWMU 39-001(a) is complete. The text, tables, figures, risk calculations, and data DVDs have been revised to incorporate the additional analyses, sampling results, and recommendations for this site.

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s)/Page(s) in Original Report	Section(s)/Page(s) in Revised Report	Nature of Revision
6	Revise Figure 3.2-6 to include the sampling locations.	Section 3.2.3.1, p. 13, paragraph 2	Section 3.2.3.1, p. 13	The text in section 3.2.3.1 has been revised to refer only to Figure 3.2-6, which shows the final excavation boundaries for SWMU 39-006(a). The sampling locations are presented in section 5.22 and in Figure 5.22-2, which is part of the site background and contamination discussion for this SWMU.
7	Revise the report to provide additional information regarding the type of material (e.g., soil, sand filter components, contaminants) placed in the excavation at SWMU 39-006(a).	Section 3.6, p. 14, paragraph 2	Section 3.6, p. 14	The text has been revised to indicate that Stockpile 3 was composed of overburden sand from the sand filter excavation, not filter material. This material was screened against residential soil screening levels (SSLs)/screening action levels (SALs) and only material below the residential SSLs/SALs was returned to the excavation.
8	Revise section to include explanation of why ecological risk screenings were not conducted at SWMUs 39-004(c), 39-004(d), 39-008, 39-001(a), 39-001(b), and 39-002(b).	Section 4.3, p. 16	Section 4.3, p. 16	The sentence has been deleted because it is not relevant for the section. Explanations as to why ecological risk-screening assessments were not conducted are provided in the risk summary section for each site.
9	Submit a work plan for additional remediation activities at SWMU 39-001(a) by December 30, 2009.	Section 6.1, p. 52	See revisions related to Specific Comment 5	Remediation and sampling at SWMU 39-001(a) is complete. The text, tables, figures, risk calculations, and data DVDs have been revised to incorporate the additional analyses, sampling results, and recommendations for this site.
10	Submit request for Certificates of Completion for SWMUs 39-001(b) and 39-005 and Areas of Concern (AOCs) 39-002(c), 39-002(d), 39-002(e), 39-002(f), and 39-007(d) under separate cover.	Section 7.1, p. 54	Section 7.1, p. 106	The sentence requesting the certificates has been deleted. LANL will request the Certificates of Completion for these SWMUs and AOC under separate cover.

NMED NOD Comment No.	Summary of NOD Comment Requirement	Section(s)/Page(s) in Original Report	Section(s)/Page(s) in Revised Report	Nature of Revision
11	Revise report to include a section addressing proposed schedule for Phase II investigation work plan submittal.	Section 7.2, p. 54	Section 7.2	LANL has proposed a schedule for the submittal of the Phase II investigation work plan.
12	Revise report to address discrepancy between section 6.1, which suggests extent not defined for mercury, uranium, and uranium-238, and section 3.2.1.3, which suggests cleanup standards were exceeded only for Aroclor-1242, thus necessitating additional remediation. Also, submit a work plan for additional remediation activities at SWMU 39-001(a).	Appendix B, Section B-2.16.5.4, p. B-62	Sections 3.2.1.3, 6.1, and 6.2	The text in sections 6.1 and 6.2 has been revised to clarify why the cleanup levels are met although the extent of some COPCs is not defined. In addition, the text in section 3.2.1.3 has been revised to explain the excavation process for remediating Aroclor-1242 at one location. Remediation and sampling at SWMU 39-001(a) is complete. The text, tables, figures, risk calculations, and data DVDs have been revised to incorporate the additional analyses, sampling results, and recommendations for this site.
13	Include residential and industrial SSLs/SALs in each summary table for each SWMU/AOC.	Section 5 data tables	Section 5 data tables	Residential and industrial (recreational for the extended drainages) SSL/SAL rows have been added to data tables.
n/a	n/a	Throughout	Throughout	Minor editorial changes were made throughout the document for the sake of correctness and clarity.

\* n/a = Not applicable.