

TA03

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 1, 2010

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**RE: NOTICE OF DISAPPROVAL
INVESTIGATION REPORT
UPPER SANDIA CANYON AGGREGATE AREA
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-10-040**

Dear Messrs. Rael and Graham:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security L.L.C.'s (LANS) (collectively, the Permittees) *Investigation Report for Upper Sandia Canyon Aggregate Area* (Report), dated May 2010 and referenced by LA-UR-10-3256/EP2010-0132. NMED hereby issues this Notice of Disapproval for the Report.

General Comments:

1. For evaluation of noncarcinogenic hazards, hazard indices (HI) were calculated separately for inorganics/organics and total petroleum hydrocarbons (TPH). It is not clear why these were evaluated separately and hazards associated with TPH were not

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combined with other hazards, even though combining the HIs from TPH with the HIs from other noncarcinogens would not affect the conclusions of the assessments. For most sites, TPH did not drive risk or contribute significantly toward risk. At Areas of Concern (AOCs) 60-004(b,d), combining the HIs for the construction worker would result in an overall HI slightly above the target level of 1.0. For AOC C-03-016, TPH drove risk for the construction worker and resident, thus combining HIs would still result in excess risk (see specific comment #25).

2. As part of the discussion of the ecological risks (Sections I-5.5 and I-5.6), a comparison to concentrations detected in other areas within the Laboratory (Los Alamos, Pueblo, Mortandad, Pajarito, and/or Sandia Canyons) that are being investigated as part of the biota study was addressed. A blanket statement was used indicating that concentrations were similar to these areas. However, no quantitative evidence was provided to demonstrate this assumption. While the ecological assessment and refined ecological assessment indicated no elevated risk to receptor species, the lack of this quantitative evidence does not impact the conclusions. However, for future assessments, if other areas being addressed under the biota studies are to be used as a line of evidence to justify elevated risk, then a more rigorous comparison (to include statistical comparison of datasets) will be required.
3. Contradictory statements regarding characterization of nature and extent of contamination were noted in sections entitled 'Soil, Rock, and Sediment Sampling Analytical Results' and 'Nature and Extent of Contamination' for several Solid Waste Management Units (SWMUs) and AOCs. For example, for SWMU 03-002(c), the Permittees state that the existing site data are not sufficient to characterize the extent of contamination at SWMU 03-002(c); therefore, organic [chemicals of potential concern] COPCs are not defined for the site (Section 6.2.4.3). However, in the next paragraph (Section 6.2.4.4), the Permittees state that the nature and extent of all organic chemicals at SWMU 03-002(c) are defined. This comment is also applicable to characterization of nature and extent of radionuclide contamination at SWMU 03-052(f) (page 76), AOC 03-014(b2) (page 92), SWMU 03-014(u) (page 135), and AOC 60-004(f) (page 255). This comment also applies to characterization of nature and extent of organic chemical contamination at SWMU 03-002(c) (page 20), SWMU 03-045(h) (page 193), SWMU 60-002 (page 242), SWMU 60-007(a) (page 265) and SWMU 60-007(b) (page 268). This comment is also applicable to characterization of nature and extent of inorganic chemical contamination at SWMU 03-056(a) (page 214) and SWMU 03-059 (page 233). The Permittees must review these sections carefully and make appropriate revisions to the text.

Specific Comments:

1. **Section 6.8.3.4, Site Contamination, Soil, Rock, and Sediment Field-Screening Results, page 38:** The text states that no organic vapors were detected during headspace gas screening at SWMU 03-029. The second bullet on page 38 does not

indicate that field screening for organic chemicals was conducted. Additionally, Table 3.2-2 indicates that no samples were collected for organic vapors. The Permittees must clarify if field screening for organic vapors was conducted at the site and make appropriate corrections to the table or text to resolve the discrepancy.

2. **Section 6.9.4.4, Nature and Extent of Contamination, page 57:** Contrary to what is reported in the text, at SWMU 03-009(i), concentrations of barium increased rather than decreased with depth at location 03-608191. Barium was not detected above the background value (BV) in the sample collected from 0-1 ft below ground surface (bgs), but was detected at a concentration of 74.4 mg/kg in the sample collected from 1-2 ft. bgs (Table 6.9-2). The Permittees must revise the statement to indicate that the vertical extent of barium is not defined at this location.
3. **Section 6.10.4.4, Site Contamination, Nature and Extent of Contamination, page 73:** The text states that the vertical extent is defined for Aroclor-1254, Aroclor-1260, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, and chrysene for SWMU 03-045(c). However, Table 6.10-12 indicates that higher concentrations for these chemicals were detected in the sample collected from the greater depth (i.e., 1-2 ft bgs). The error may have arisen because the reporting order has been reversed (i.e., samples collected from the deeper sampling interval are reported on the first row and samples collected from the shallower depth are reported on the second row), which is different from how results are generally reported for other sites. The Permittees must resolve the discrepancy and reevaluate the nature and extent of organic chemicals contamination at SWMU 03-045(c), if necessary.
4. **Sections 6.14.1.6, 6.14.2.5, 6.14.4.5, 6.14.6.5, 6.14.7.6, 6.14.8.5, 6.14.9.5, and 6.14.10.5, Delayed Site Investigation Rationale, pages 89, 90, 96, 104, 105, 106, 107, and 108:** The Permittees state that previous and current investigations conducted around these sites while not sufficient to fully determine the nature and extent of contamination, provide data indicating it is not likely that releases occurred when these components of the former wastewater treatment plant (WWTP) were in operation. The data presented in accompanying tables clearly indicate that releases have occurred; several organic chemicals were detected and several inorganic chemicals were detected above their respective background values. These data indicate that the vertical extent is defined at most of the locations where samples were collected. NMED concurs that further investigations may be delayed until decontamination and decommissioning (D&D) of the former WWTP structures is completed. The Permittees must revise the statements to reflect that releases are indicated at these sites.
5. **Section 6.14.3.5, Site Contamination, Nature and Extent of Contamination, page 93:** Along with samples collected at the site, the Permittees used samples collected in reach S-2 of Sandia Canyon to define the lateral extent of several contaminants at AOC 03-014(b2). Figure 6.14-1 and Plates 18 and 19 that depict sampling locations and detected concentrations of contaminants at AOC 03-014(b2) do not include sampling

locations and results for samples collected in reach S-2. The Tables reporting detected concentrations of contaminants for AOC 03-014(b2) also did not include results for these canyon locations. It is difficult to evaluate the lateral extent of contamination without this information. The Permittees must revise the figures and tables to include sampling locations and results of the samples collected in the Sandia Canyon Reach that were used in site characterization.

6. **Section 6.14.13.4, Soil, Rock, and Sediment Sampling, page 113:** In the second bullet the Permittees state that 12 samples were proposed for collection from four locations around and downgradient of SWMUs 03-014(k,l,m,n), but eight samples were collected. In fact, 16 samples were proposed to be collected from these four locations in the approved work plan. As discussed in the deviations to the work plan (Appendix B), at three of the four locations “bed tuff interface” corresponded to the proposed sample of “0-1 ft below base of the bed”; therefore, one sample was collected to represent both sampling criteria. This should have resulted in 13 samples collected from the four locations. According to Table 6.14-24, 11 samples were collected from the four locations. The Permittees must resolve the discrepancies and revise the text accordingly.
7. **Section 6.14.19.4, Site Contamination, Nature and Extent of Contamination, pages 135-136:**
 - a. NMED’s Approval with Modifications (August 12, 2008) for the investigation work plan directed the Permittees to collect nine samples from three locations within and next to the location of former tank and drainline (locations 03-608281, 03-608282, and 03-608283). The Permittees only collected five samples from these three locations and provided explanation for not collecting the sixth sample. The Permittees must explain why the direction to collect nine samples was not followed.
 - b. The Permittees state that the vertical extent of contamination is defined for several metals. Although the detected concentrations indicate a decreasing trend, the concentrations are still significantly higher than the background values in samples collected from the deepest interval. For example, concentrations of chromium, copper, and silver decrease with depth at the sampling location 03-608281, the detected concentrations in sample collected from 1.0-2.0 ft (the deeper sample) are higher than the background values. The extent of contamination is not defined for the entire SWMU 03-014(u). The Permittees must collect additional samples at location 03-608281 to define the vertical extent of contamination.
8. **Section 6.14.20.4, Site Contamination, Nature and Extent of Contamination, pages 141-142:** Several inconsistencies were noted in the discussion of nature and extent of contamination at SWMU 03-056(d). For example, at several places, the sampling

location 03-608288 is referred to as a location that is northeast of SWMU 03-056(d). However, as depicted in Plate 18, the sampling location 03-608288 is located within the SWMU boundary. The Permittees are most probably referring to location 03-608256, located northeast of the SWMU. Similarly, locations 03-608247 and 03-608263 are located south and north of the SWMU, respectively, not north and south as reported. The Permittees must revise the text accordingly.

9. **Section 6.19.1.4, Site Contamination, Soil, Rock, and Sediment Sampling, page 148:** The Permittees were directed to collect an additional sample in the drainage northeast of SWMU 03-015 in the Approval with Modifications letter (August 12, 2008). The Permittees neither collected additional samples from this location nor provided justification for not following the approved work plan. The Permittees must explain why samples were not collected from this additional location during the 2009 investigations.
10. **Section 6.22.4.2, Site Contamination, Soil, Rock, and Sediment Sampling Analytical Results, pages 165-166:** According to Table 6.22-1, decision-level data consisted of six fill and three tuff samples collected from six locations, not five fill samples as stated. The Permittees did not provide a reference of figures where spatial distribution of detected inorganic and organic chemicals is presented for AOC 03-027. To facilitate review of the Report, the Permittees must provide figures showing spatial distribution of detected COPCs at AOC 03-027.
11. **Section 6.23.1, Site description and Operational History, page 168:** AOC 03-036(b), the location of two former aboveground storage tanks, is southwest of an asphalt batch plant (building 03-73) as depicted on the Figure 6.2-1, not 100 ft west of building 03-73, as reported. Section 6.23.2 also describes the location of AOC 03-036(b) as located about 50 ft southwest of structure 03-73. The Permittees must revise the text to accurately describe the location of the former tanks.
12. **Section 6.26.4.4, Nature and Extent of Contamination, page 181:** The Permittees state that the lateral and vertical extent of tritium is defined. NMED agrees that tritium was detected at very low concentrations at two out of the six locations sampled. However, the tritium activities increased with depth at both these locations (i.e. 03-608310 and 03-608311). The vertical extent of tritium is not defined at AOC 03-038(d). Samples were collected from 0.0-1.0 and 1.0-2.0 ft bgs in accordance with the approved work plan; however, it is not clear from the review of the historical investigation report the depth at which former waste lines were located. The detected concentrations of several other chemicals also increased with depth at these locations. The Permittees propose to conduct additional investigations to define the vertical extent of antimony at AOC 03-038(d). The Permittees must also define the vertical extent of tritium at these two locations. In addition, the Permittees must provide the depth at which former waste lines were located to ascertain that samples were collected from potentially contaminated media and at appropriate depths.

13. **Section 6.31.5, Delayed Site Investigation Rationale, page 189:** NMED concurs with the Permittees' rationale to delay characterization and investigation of a portion of SWMU 03-045(e) until D&D of structure 03-57, the diesel tanks, and piping associated with the power plant. However, one sample collected to characterize the outfall location indicates that concentrations of contaminants increase with depth at this location. The Permittees must define the vertical extent of contamination at this location and collect additional samples in the drainage channel to define the lateral extent of contamination in the drainage.
14. **Section 6.33.4.1, Soil, Rock, and Sediment Sampling, page 193:** The Permittees state that one 2009 sampling location (MO-604952) at SWMU 03-045(h) is shown on Figure 6.5-1. The Table 6.33-1 indicates that two samples were collected from one location at SWMU 03-045(h). However, Figure 6.5-1 does not depict this sampling location. The Permittees must revise Figure 6.5-1 to include the sampling location.
15. **Section 6.37.4.4, Nature and Extent of Contamination, page 208:** The text indicates that the lateral and vertical extent of manganese is defined at AOC 03-052(b). Manganese was detected at two locations and the concentrations increased with depth (location 03-608335); from 873 mg/kg (1.0-2.0 ft) to 1350 mg/kg (4.0-5.0 ft). The Permittees must define the vertical extent of manganese at this location.
16. **Section 6.38.1, Site Description and Operational History, page 211:** SWMU 03-052(c) is located southwest of former Sherwood Complex (building 03-105) and northwest of the former Syllac Building (03-287). Figure 6.3-1 depicts locations of the former cooling tower and pump house, and structure 03-287, but does not include the location of former structure 03-105. This omission makes it difficult to follow the discussion on previous investigations. The Permittees must revise Figure 6.3-1 to include location of former structure 03-105.
17. **Section 6.42.4.4, Nature and Extent of Contamination, page-224:** 4-Isopropyltoluene was detected in the deepest sampling interval at location 03-608352, not 03-60835 as stated. Additionally, the statement that toluene was not detected at downgradient locations 03-608352, 03-608354, 03-608355, and 03-608356 is incorrect. As shown in Table 6.42-3 toluene was detected at locations 03-608352, 03-608354, and 03-608356 and at locations 03-608354, and 03-608356 the detected concentrations increased with depth.. The Permittees must revise the text accordingly.
18. **Section 6.43.4.4, Nature and Extent of Contamination, page-228:** Contrary to the Permittees' statement that copper concentrations decreased at location 03-22333, copper concentrations in fact increased with depth at this location. However, copper concentrations decreased with depth at a nearby location (03-608364); therefore the vertical and lateral extent of copper is defined at SWMU 03-056(l). The Permittees must clarify the text accordingly.

19. **Section 7.8.4.1, Soil, Rock, and Sediment Sampling, page-267:** The Permittees state that at four locations (03-608417, 03-608418, 03-608419, and 03-608420)) tuff was encountered at depths less than 1 ft bgs, and samples were collected only from one depth at these locations. The approved work plan proposed collecting samples from two depths at these locations (i.e., at 0-1 ft and 1-2 ft). It is not clear why samples were not collected from tuff to define the vertical extent of contamination. Additionally, the Section B 10.0 of Appendix B does not include discussion of the deviations from the work plan at SWMU 60-007(b). The Permittees must revise Appendix B to explain why approved work plan was not followed.
20. **Section 9.1.1, Conclusions, TA-03, pages 280-281:** Several discrepancies were noted between the discussion of nature and extent in the Report and the conclusions presented in this section. Several COPCs for which the extent is not defined were omitted in this section. For example,
- a. The extent of contamination for organic chemicals is not defined for SWMU 03-012(b), as discussed on page 64. The Permittees failed to include organic chemicals in the list of COPCs for which extent is not defined. Revise the conclusions for SWMU 03-012(b) accordingly.
 - b. The lateral and vertical extent of acenaphthene is not defined for SWMU 03-014(o) as stated on page 130, but the Permittees did not include acenaphthene in the list of chemicals for which extent is not defined. Revise the conclusions accordingly.
 - c. The vertical and lateral extent of lead is not defined for AOC 03-056(k) as stated on page 222. In the conclusions, the Permittees reported that only the lateral extent of lead is not defined. The Permittees must revise the statement to indicate that both lateral and vertical extent of lead is not defined at AOC 03-056(k).
21. **Section 9.1.3, Conclusions, TA-61, page 282:** As stated in NMED's Approval with Modification (August 12, 2008) SWMU 61-002 was not considered part of this investigation and was not reviewed as part of this Report. NMED issued a Notice of Disapproval (NOD) for the *Remedy Completion Report for the Investigation and Remediation of Solid Waste Management Unit 61-002 at Technical Area 61* on August 9, 2007. Samples collected from the northwest locations at the site had concentrations of organic chemicals that exceeded residential, construction worker, and industrial soil screening levels. However, the Permittees used a 95% upper confidence limit (UCL) of the mean to calculate exposure point concentrations (EPCs) to conclude that the site did not pose unacceptable risk under an industrial exposure scenario (the site posed unacceptable risk under construction worker and residential scenario). The use of UCLs to calculate EPCs is inappropriate for the site because contaminated area is easily identifiable and is concentrated in the northwest area. Specific Comment # 1 of the

NOD directed the Permittees to submit a work plan to conduct additional soil removal at the site. The Permittees declined to comply with the direction. The corrective action is therefore not complete at the site.

22. **Section 9.1.3, Conclusions, TA-61, page 282:** The Permittees propose no further action for SWMU 61-005 (landfill) and SWMU 61-006 (used oil storage tank). No sampling was conducted during the 2009 investigations at SWMUs 61-005 and 61-006 because they were addressed under other regulatory programs. Corrective action complete status will not be evaluated for these sites until the appropriate documentation is provided to NMED.
23. **Figure 6.4-1, Site map of SWMUs 03-015 and 03-056(l) and AOCs 03-003(d), 03-047(g), 03-051(c), and 03-053, page 302:** One concrete chip sample and ten soil samples were collected from five locations at AOC 03-003(d) during the 2009 investigations. According to the legend in the figure, red circles denote locations where only surface samples were collected and red triangles indicate locations where both surface and subsurface samples were collected. Figure 6.4-1 depicts two triangles and three circles for AOC 03-003(d). However, the Tables 6.4-1 and 6.4-2 and the text indicate that soil samples were collected from two depths at all five locations. The Permittees must revise the figure to depict the accurate sampling locations.
24. **Figures 7.3-1 and 7.3-2, pages 322 and 323:** Figures 7.3-1 and 7.3-2, depicting spatial distribution of all contaminants should include all historical and current sampling locations. Locations 60-10002 and 60-10003 are not depicted on these figures. Table 7.7-1 lists all decision-level data collected at SWMU 60-007(a), and includes these sampling locations. No organic and inorganic COPCs were identified. Nevertheless, these locations should have been depicted on the figures for nature and extent evaluations. The Permittees must revise these figures to include all sampled locations.
25. **Table 3.2.-2, Field Screening Results for Samples Collected in 2009, pages 341-359:** Table 3.2-2 presents results of field screening conducted during the 2009 investigations. NMED noted that in general, for radionuclides the same result is reported for all samples collected at a particular SWMU or AOC. For example, at SWMU 03-002(c) nine samples were collected from four locations. For gross alpha, an activity of 25.6 disintegrations per minute (dpm) is reported for all nine samples. Similarly for beta/gamma activity, all results were reported at 1860 dpm. The Permittees must explain if radioactivity was measured for each individual sample and why the same result was generated by all nine samples.
26. **Tables 6.8-7, 6.8-8, and 6.8-9, pages 378-380:** Tables 6.8-8 and 6.8-9 incorrectly report location numbers for samples RE03-09-13445 and RE03-09-13446, as 03-22536 at SWMU 03-029. In Table 6.8-7 it is reported correctly as 03-608184. The Permittees must correct the location numbers for these two samples and revise the tables accordingly.

27. **Appendix B, Section B-10.0, Deviations from Work Plan, pages B-6 to B-8:** The second bullet states that one sample was not collected at SWMU 03-014(k) (location 03-608266) from 8-9 ft bgs because no recovery of material occurred from that interval during drilling. Sampling location 03-608266 is not associated with SWMU 03-014(k) according to Table 6.14-24 or Figure 6.14-1. The Permittees may have confused it with location 03-608273, because results from 8-9 ft bgs sampling interval at location 03-608273 are not reported in the Table 6.14-24. In addition, discussion of deviations at SWMU 60-006(a) is repeated and provided on page B-7 and B-8. The Permittees must make appropriate revisions to the text.
28. **Appendix B, Table B-10.0-1, Summary of Sampling Deviations from the Approved Work Plan, pages B-12:** The Permittees have associated sampling locations 03-608265, 03-608266, and 03-608268 with SWMU 03-014(k). Review of Table 6.14-24 and Plates 18 and 19 indicates that these locations are not associated with SWMU 03-014(k). The Permittees must provide correct sampling locations and note where samples were not collected in accordance with the approved work plan.
29. **Section I-4.3.2, Exposure Evaluation, AOC 03-038(c), page I-21:** AOC 03-038(c) had an elevated hazard quotient for the construction worker. The primary hazard drivers were manganese (85.7%) and cobalt (11.4%). Cobalt also was the primary driver for an elevated residential hazard quotient (50%). A discussion is provided indicating that the risks are overestimated for the site and to illustrate this point, the exposure point concentration is divided by the maximum background concentration resulting in a HI of 2 (for the construction worker). It is not clear why the EPC was divided by background; nonetheless, the resulting HI is still above the target hazard level. Additional lines of evidence are required to justify the elevated risks due primarily from manganese and cobalt. Alternately, site controls to ensure protection against inhalation hazards should be in place for any future development of the site. This comment also applies to the HI evaluations for SWMU 03-056(l).
30. **Section I-4.3.2, Exposure Evaluation, AOC C- 03-016, page I-21:** AOC C-03-016 has an elevated construction worker hazard quotient with 100% of the hazard being contributed by manganese. In addition, the hazard quotient for the construction worker (HQ = 6) and the residential (HQ = 14) scenarios for the total petroleum hydrocarbon – diesel range organics (TPH-DRO) exceeded the target hazard levels. The discussion of the risk results includes manganese but does not address risks due to TPH-DRO. Both the construction worker and resident have significantly elevated HIs due to TPH-DRO. The Permittees must either provide sufficient justification demonstrating that additional investigation or remediation is not needed or propose to conduct additional work at AOC C-03-016.
31. **Plates 16 and 17, Inorganic Chemical Concentrations Detected or Detected Above BVs at SWMU 03-013(i) and Organic Chemical Concentrations Detected at**

SWMU 03-013(i): NMED could not locate historic sampling location 03-24451 on Plates 16 and 17. The Permittees must revise Plates 16 and 17 to include all sampling locations.

The Permittees must respond to all comments and submit a revised Report by **October 1, 2010**. As part of the response letter that accompanies the revised Report, the Permittees must include a table that details where all revisions have been made to the Report and that cross-references NMED's numbered comments. All submittals (including maps and tables) must be in the form of two paper copies and one electronic copy in accordance with Section XI.A of the Order. In addition, the Permittees must submit a redline-strikeout version that includes all changes and edits to the Report (electronic copy) with the response to this NOD.

Please contact Neelam Dhawan at (505) 476-6042, if you have any questions.

Sincerely,



James P. Bearzi
Chief
Hazardous Waste Bureau

BRZ:nmd

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