



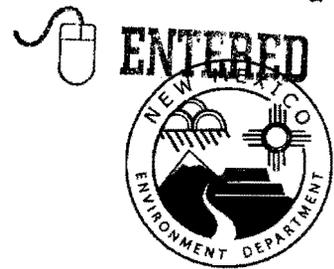
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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

December 22, 2010

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**RE: NOTICE OF DISAPPROVAL
INVESTIGATION REPORT FOR S-SITE AGGREGATE AREA
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-10-071**

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 S-Site Aggregate Area* (Report), dated August 2010 and referenced by LA-UR-10-5472/EP2010-0276. NMED hereby issues this Notice of Disapproval (NOD) for the Report.

General Comments:

1. The construction worker scenario was not included in the risk assessment. The reasonable foreseeable future use of sites in the S-Site Aggregate Area is industrial (Section 4.1); these areas include Solid Waste Management Units (SWMUs) 16-004(a), 16-004(e), and 16-029(d). It is plausible to assume that at some point in the

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future, intrusive activities may occur in these areas, and as such, the risk assessments must demonstrate that residual contaminant concentrations are protective of a future construction worker. An evaluation of residential risk does not always equate to an assumption of protectiveness for all receptors. In several cases, the screening levels for metals for a construction worker are more conservative than those for a resident. As inorganic chemicals that typically drive inhalation risk to the construction worker were not detected at the three SWMUs, the residential screening assessment is deemed protective of a future construction worker. However, when assessing risk for SWMUs where additional characterization is needed, this assumption may not hold true. In future assessments and specifically for the remaining SWMUs to be evaluated in the S-Site Aggregate Area, the construction worker receptor must be evaluated.

2. Sampling was conducted downgradient of the S-Site Aggregate Area in the Fishladder Canyon subarea and in Martin Spring Canyon. The report indicated that the purpose of the sampling was to determine whether there is migration into the adjacent canyon areas. Therefore, neither human health nor ecological risk was evaluated for either the Fishladder Canyon subarea or the Martin Spring Canyon Drainages. Based on a review of the data, it appears that there may be contamination above risk-based levels as well as potential elevated ecological risk. It is not clear whether the Permittees intend to investigate these areas further under a separate investigation; the report mentions several times that these two areas are not specifically defined in the Report as a SWMU or an Area of Concern (AOC). However, risk assessments must be conducted to evaluate contamination in both the Fishladder Canyon subarea and in Martin Spring Canyon.
3. Six S-Site Aggregate SWMUs [16-006(h), 16-013, 16-017(q)-99, 16-017(r)-99, 16-017(s)-99, and 16-017(t)-99] are located within the V-Site Courtyard Area. The report indicates that historic preservation restrictions prohibit the Permittees from sampling within this area, thereby preventing the determination of the nature and extent of contamination for the sites. NMED approved the Permittees' proposal to move sampling to the periphery of the V-Site Courtyard. However, by sampling at the periphery, the Permittees will only be able to determine whether any contaminants are migrating off-site. Because of the historic nature of the Courtyard Area, the Permittees occasionally conduct tours for the public to view the area. To ensure that the public is protected during site visits, the area was evaluated for potential human health risk using the recreational scenario to represent site visitors. While the risk assessment concludes that residual levels are within recreational screening levels, this conclusion is based upon contaminants potentially migrating off-site, and not upon contaminant levels present on-site and in the visiting areas. In addition, the Permittees must not conclude that there is no risk to visitors to this site as Section 9.15.4 of the report clearly states that the nature and extent of contamination has not been defined. NMED cautions the Permittees about opening this area to the public, as risks to an on-site tourist have not been defined. Further, additional sampling and risk

evaluation is warranted to assess levels of contamination outside of the Courtyard Area for exposure to other receptors (e.g., industrial) during the Phase II of investigations.

4. Analytical data from off-site sample locations 16-01457 and 16-609215 at SWMU 16-026(b) indicate off-site migration of SWMU-related contamination. The data also indicate that the contaminant migration is resulting in increasing concentrations for inorganic and organic constituents of potential concern (COPCs). Therefore, the extent of contamination has not been defined for COPCs that have migrated off-site, and additional sampling is warranted to determine the extent of off-site migration. In addition, a risk evaluation is needed to assess whether corrective action or other controls may be warranted to mitigate contamination that has migrated beyond the SWMU 16-026(b) boundary.
5. The *Investigation Work Plan for S-Site Aggregate Area, Revision 1*, December 2007 (IWP) proposed analysis of boron for the samples to be collected at all sites included in the K-Site Subaggregate. The review of text and tables indicates that boron analyses were not conducted. No explanation for this omission was included in Appendix C, where deviations from the approved work plan are documented. The Permittees must provide an explanation for not including boron analysis in the analytical suite.

Specific Comments:

1. **Section 4.3, Ecological Screening Levels, page 19:**
NMED Comment: Section 4.3 references data from two versions of the EcoRisk database. Ecological Screening Levels (ESLs) were taken from the 2008 version of EcoRisk while all other chemical/physical data were from the 2009 version of EcoRisk. It is not clear why version 2.4 of EcoRisk (2009) was not used for obtaining the ESLs. The Permittees must clarify whether this is a typographical error and, if not, why the most current ESLs were not applied.
2. **Section 6.6.2, Summary of Previous Investigations, page 36:**
NMED Comment: The Permittees state that one surface sample was collected within the outfall (location 16-05904) at SWMU 11-006(b) during the 1998 investigations. Tables 6.6-1 and 6.6-2 indicate that two sediment samples were collected from two locations in 1998 (locations 16-05903 and 16-05904). In addition, Figures 6.6-1, 6.6-2, and 6.6-3 do not depict sampling location 16-05903. The Permittees must clarify whether one or two sediment samples were collected during 1998 investigations and revise the appropriate text, tables, and figures in the Report accordingly.
3. **Section 6.6.5.2, Organic Chemicals, pages 40-41:**
Permittees' Statements:
 - a. HMX was detected at 13 locations. Concentrations increased with depth at

location 11-608831 and downgradient (locations 11-608817 and 11-608816). Concentrations decreased with depth at all other locations. Therefore, the vertical extent of HMX is not defined, and the lateral extent is defined.

- b. TATB was detected at locations 11-608826 and 11-608831.

NMED Comments:

- a. Above statements appear to contradict each other. The lateral extent cannot be considered defined at SWMU 11-006(b), if the concentrations of high-melting explosives (HMX) increased downgradient. However, review of Table 6.6-3 indicates that the concentrations decreased downgradient (at locations 11-608817 and 11-608816). The Permittees must resolve the discrepancy and revise the text accordingly.
- b. Table 6.6-3 indicates that triaminotrinitrobenzene (TATB) was detected in five samples from four locations, i.e., 11-608826, 11-608831, 11-608821, and 11-608823. Revise the text accordingly, or otherwise resolve the discrepancy.

4. Section 6.6.5.3, Radionuclides, page 41:

Permittees' Statement: Uranium-234 was detected above the BV in three soil samples at locations 11-608817, 11-608824, and 11-608827. Concentrations decreased with depth and at the furthest locations downgradient. Therefore, the vertical extent of uranium-234 is defined, and the lateral extent is not defined.

NMED Comment: Above statements appear to contradict each other. Table 6.6-4 indicates that the concentrations decreased with depth and downgradient; therefore, both the vertical and lateral extent of uranium-234 is defined at SWMU 11-006(b). The Permittees must revise all applicable text accordingly.

5. Section 6.7.5.1, Inorganic Chemicals, page 44:

Permittees' Statement: Chromium was detected above the Qbt 2, Qbt 3, and Qbt 4BV at five locations at locations 11-608748 and 11-608749.

NMED Comment: Chromium was detected above the Qbt 2, Qbt 3, and Qbt 4 background value (BV) at five locations, (11-608742, 11-608748, 11-608749, 11-608750, and 11-611743). The Permittees must correct the above statement to clarify that chromium was detected above the BV at five locations and the concentrations increased with depth at only two locations (11-608748 and 11-608749) at SWMU 11-006(c).

6. Section 6.9.5.1, Inorganic Chemicals, page 52:

Permittees' Statement: Copper was detected at five locations above its soil and Qbt 2, Qbt 3, and Qbt 4 BVs. At locations 11-608751, 11-608752, and 11-608756, concentrations decreased with depth. At location 11-608757, concentrations increased with depth.

NMED Comment: Table 6.9-2 indicates that copper was detected above its soil BV and Qbt 2, Qbt 3, and Qbt 4 BVs at six locations at SWMU 11-005(c). The concentration of copper increased with depth at two locations (11-608757 and 11-611744). The vertical extent of copper is not defined. The Permittees must revise the text accordingly. In addition, chromium was detected above its Qbt 2, Qbt 3, and Qbt 4 BVs at only two locations, not three. Table 6.9-2 does not list detection of chromium at location 11-611744. The Permittees must resolve the discrepancies and revise the text or table accordingly.

7. Section 6.12.5.1, Inorganic Chemicals, page 64:

Permittees' Statement: Perchlorate was detected at location 11-608763.

NMED Comment: Table 6.12-2 indicates that perchlorate was detected at two locations (11-608763 and 11-608765). The omission does not change the conclusion that the extent of perchlorate is defined for SWMU 11-011(d) because the concentrations decreased with depth and downgradient. The Permittees must revise the Report accordingly.

8. Section 6.12.5.2, Organic Chemicals, page 64:

Permittees' Statement: Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in surface samples at one or two locations. Concentrations decreased with depth and downgradient. The extent of these organic chemicals is defined.

NMED Comment: Table 6.12-3 indicates that fluoranthene was not detected in the surface sample but was detected in the subsurface sample at SWMU 11-011(d) (location 11-608762). In addition, several discrepancies were found between the concentrations reported in the Table 6-12-3 and Figure 6.12-3. For example, HMX (0.0218 mg/kg) is reported on Table 6.12-3 but is not depicted on the Figure 6.12-3; two detections of HMX are indicated at location 11-608765. Similar discrepancies were noted for benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, and isopropyltoluene[-4]. The Permittees must conduct a thorough review of the Report to ensure concentrations reported in the text, tables and figures are consistent.

9. Section 7.7.5.2, Organic Chemicals, page 80:

Permittees' Statement: Methylene chloride was detected at locations 16-608920 and 16-608921.

NMED Comment: Methylene chloride was detected at three locations, not two at Area of Concern (AOC) 16-024(u). It was detected at locations 16-608918, 16-608920 and 16-608921 (see Table 7.7-3). The Permittees must revise the text accordingly.

10. Section 7.12.5, Spatial Distribution, page 97:

Permittees' Statement: Thirty-six samples were collected from 17 locations (Figure 7.12-1). Surface and subsurface samples were collected within the vicinity of the inactive drainlines and outfall. Seventeen surface samples were collected at an interval of 0.0–0.5 ft bgs, and 21 subsurface samples were collected at the following depth intervals: three samples at 3.0–3.5 ft bgs, one sample at 4.0–4.5 ft bgs, 15 samples at 5.5–6.0 ft bgs, and two samples at 9.0–9.5 ft bgs (Appendix C, section C-7.2.5).

NMED Comment: The Permittees collected 19, not 21, subsurface samples at SWMU 16-029(h). Thirteen samples, not 15, were collected at 5.5-6.0 ft bgs (see Table 7.12-1). The Permittees must revise the text accordingly.

11. Section 7.15.5.4, Summary of Extent, page 109:

Permittees' Statement: The vertical extent is defined for all COPCs. No radionuclides were detected. Therefore, the overall extent of contamination at SWMU 16-004(a) is defined.

NMED Comment: The Permittees were not able to collect samples from one proposed location in the center and beneath the existing structure because the location was not accessible. The Permittees must collect additional samples underneath the structure to define the extent of contamination. The extent of contamination is not defined for SWMU 16-004(a). The Permittees may defer the investigations until the decontamination and decommissioning (D&D) of the structure when the location becomes accessible to collect samples.

12. Section 7.16.5, Spatial Distribution, page 111:

Permittees' Statement: Because the direction of potential contaminant migration is into the subsurface below the Imhoff tank, four boreholes were drilled surrounding the structure. Samples were collected at two depths between 20.0 and 30.0 ft bgs at each borehole. Because of the presence of underground utilities in the area of the tank, borehole locations were adjusted. The borehole to the southeast of the tank was moved out approximately 30.0 ft to the south.

NMED Comment: The paragraph appears to be copied directly from page 108 and is not relevant to the discussion of SWMU 16-004(b), which is a trickling filter, not the Imhoff tank. In addition, several discrepancies were noted between Figure 7.16-1, Section 7.16.5, and Section C-7.2.8. Figure 7.16-1 indicates that the borehole to the southwest (location 16-608687), not southeast, was moved and the borehole to the southeast (location 16-608686) was not moved; the borehole to the northwest of the trickling filter was also moved. The Permittees must resolve the discrepancies and revise the text or figure accordingly.

The Permittees must also note that the sample in the center and beneath the trickling filter was not collected because of the accessibility issue. To complete the determination of

extent, the Permittees must collect samples beneath the structure whenever it becomes accessible. The Permittees may defer the investigation of contamination beneath the structure until D&D of the structure. See Comment #11.

13. Section 7.17.5, Spatial Distribution, page 114:

Permittees' Statement: Because of the presence of the structure, the original five location points proposed, after communication with NMED, were changed to four location points (Appendix C, section C-7.2.9). One proposed location in the center of and beneath the existing structure was not sampled because the location was not accessible. Two samples had been planned from this location.

NMED Comment: The Permittees must collect the samples from the center of and beneath the existing structure when it becomes accessible to complete determination of the extent of contamination at SWMU 16-004(c). The Permittees may defer the investigation of contamination beneath the structure until D&D of the structure. See also Comment #11.

In addition, the Permittees must revise the text in the first paragraph to indicate that the description in this section is applicable to the clarifier tank, not the Imhoff tank.

14. Section 7.20.5, Spatial Distribution, page 122:

Permittees' Statement: Because the direction of potential contaminant migration is into the subsurface below the Imhoff tank, four boreholes were drilled surrounding the structure. Samples were collected at two depths between 20.0 and 30.0 ft bgs at each borehole. Because of the presence of underground utilities in the area of the tank, borehole locations were adjusted. The borehole to the southeast of the tank was moved out approximately 30.0 ft to the south.

NMED Comment: The paragraph appears to be copied directly from page 108 and is not relevant to SWMU 16-004(f). SWMU 16-004(f) is an inactive sludge drying bed, not an Imhoff tank. The Permittees must revise the text and delete discussion of Imhoff tank.

15. Section 8.3.5.1, Inorganic Chemicals, page 132:

Permittees' Statements: Mercury was detected above the soil BVs at all four locations. Mercury concentrations decreased with depth at all locations except at location 16-609174, where only one depth was sampled. Therefore, the extent of mercury is not defined.

Zinc was detected above the soil and/or Qbt 2, Qbt 3, and Qbt 4 BVs at all four locations. Zinc concentrations decreased with depth except at location 16-609174, where only one depth was sampled. Therefore, the extent of zinc is defined.

NMED Comment: Both mercury and zinc were detected at location 16-609174, where only one depth was sampled. The Permittees concluded that extent was defined for zinc,

but was not defined for mercury for SWMU 16-001(e). The Permittees must clarify why different conclusions were drawn for extent of zinc and mercury when the detection status was similar in both cases.

16. Section 8.3.5.2, Organic Chemicals, page 134:

NMED Comment: In Section 8.3.5.2, the Permittees determined that lateral extent of 2,4,6-Trinitrotoluene was not defined at SWMU 16-001(e). The Permittees did not mention 2,4,6-Trinitrotoluene in Section 8.3.5.4 and Section 11.1.3, where nature and extent of contamination is summarized. The Permittees must revise the Report accordingly.

17. Section 8.4.5.1, Inorganic Chemicals, page 136:

Permittees' Statement: Thallium was detected above the soil BV at location 16-611884. Thallium was not detected in the footprint of the sump or the closest step-out location, and concentrations decreased with depth. Therefore, the extent of thallium is not defined.

NMED Comment: Section 8.4.5.1 indicates that the extent is defined for thallium at SWMU 16-003(d). The Permittees must clarify why extent of thallium contamination is considered undefined.

18. Section 8.7.5.2, Organic Chemicals, page 147:

Permittees' Statement: Acenaphthene, anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, pyrene, phenanthrene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, and chrysene were detected at both locations (16-609186 and 16-609187).

NMED Comment: At SWMU 16-003(g), acenaphthene and fluorine were detected only at one location (16-60918), not two. The concentrations of acenaphthene and fluorine increased with depth at this location (see Table 8.7-3). The Permittees must revise the text accordingly.

19. Section 8.8.4.1, Inorganic Chemicals, page 149:

Permittees Statements:

- a. Concentrations of barium decreased from location 16-609189, nearest the outfall, and location 16-01456 downgradient to locations 16-609190 and 16-01456.
- b. Chromium was detected above the Qbt 2, Qbt 3, and Qbt 4 BV (7.14 mg/kg) in one sample with a maximum concentration of 23.6 mg/kg. Because there were less than 10 samples, statistical tests could not be performed. The maximum concentration was below the maximum background concentration (13 mg/kg). Chromium is not identified as a COPC in tuff.
- c. Total cyanide was not detected above the BV in the deepest sample analyzed for total cyanide at location 16-609192.

NMED Comment:

- a. The detected concentration of barium at location 16-01456 was 1190 mg/kg, which was the highest detected concentration at SWMU 16-026(b). The concentration of barium detected closest to the outfall was 161 mg/kg. Concentrations of barium increased, not decreased downstream from the location closer to the outfall. The Permittees must revise the Report accordingly.
- b. The maximum detected concentration of 23.6 mg/kg is not below the maximum background concentration of 13 mg/kg. Therefore, chromium must be identified as a chemical of potential concern (COPC) for SWMU 16-026(b). The Permittees must make appropriate revisions to the Report.
- c. Samples collected at location 16-609192 were not analyzed for total cyanide. The Permittees reported this as a deviation; cyanide was mistakenly omitted from the analytical suite (Section C-7.3.7). Cyanide was detected at a concentration slightly above the BV in a subsurface sample collected at location 16-609189. The Permittees must revise the Report accordingly.

20. Section 8.8.4.2, Organic Chemicals, page 150:

NMED Comment: Section 8.8.4.2 does not list 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene as COPCs for SWMU 16-026(b). It is noted that the risk assessment in Appendix H included the evaluation of these two COPCs. The Permittees must revise Section 8.8.4.2 to include 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene as retained COPCs.

21. Section 8.8.5.1, Inorganic Chemicals, page 150:

Permittees' Statement: Barium was detected above the sediment and Qbt 2, Qbt 3, and Qbt 4 BVs at locations 16-609189 and 16-01456. Only surface samples were collected at locations 16-01654 and 16-01456. The deeper samples at locations 16-609192 and 16-609190 revealed that concentrations decreased with depth.

NMED Comment: According to Figure 8.8.2 and Table 8.8-2, samples were collected at 5-6 feet below ground surface, and barium was detected at this interval at location 16-01654 at SWMU 16-026(b). The Permittees must revise the text to state that surface and subsurface samples were collected at location 16-01654, and barium was detected in a subsurface sample. In reviewing Figure 8.8.2, it does not appear that the barium concentrations of deeper samples at location 16-609190 decreased with depth. Barium was not detected above background values (BVs) in the surface samples but was detected above BVs with increasing depth at locations 16-609190 and 16-609192. Revise the text accordingly.

22. Section 8.8.5.2, Organic Chemicals, page 151:

NMED Comment: Section 8.8.5.2 states that concentrations of many organic COPCs decreased downgradient at sample locations 16-01456 and 16-609190. However, the data indicate increasing concentrations downgradient at sample location 16-609190 for acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, phenanthrene, and pyrene. It appears that concentrations initially decrease downgradient from the source, but increase again towards the opposite end of the SWMU boundary. The Permittees must provide further support for their assertion that the extent of contamination at SWMU 16-026(b) is defined.

In addition, 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene were detected in the surface interval at SWMU 16-026(b). 2-Amino-4,6-dinitrotoluene was also detected in the subsurface at sample location 16-609189, and its concentration does not decrease with increasing depth. This section does not indicate whether the vertical or lateral extent of contamination for these chemicals is defined. The Permittees must revise the text to include discussion on whether the extent of contamination of 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene is defined at SWMU 16-026(b).

23. Section 8.9.2, Summary of Previous Investigations, page 154:

Permittees' Statement: Data from the 1995 RFI are screening-level data and are presented in Appendix E of the HIR (LANL 2008, 100693).

NMED Comment: In general, screening level data are not used for site evaluations. NMED notes that data from the 1995 RFI is included in associated figures and tables and was used for determination of extent of contamination at SWMU 16-026(c). The Permittees must clarify if the 1995 RFI data are decision-/or screening-level data.

24. Section 8.10.5.1, Inorganic Chemicals, page 159:

Permittees' Statements:

- a. Cadmium and total cyanide were not detected above BVs but had detection limits above BVs. Therefore, the extent of cadmium and total cyanide is defined.
- b. Copper was detected above the soil BV at location 16-611017 and above the Qbt 2, Qbt 3, and Qbt 4 BV at locations 16-01465 and 16-01656. Concentrations decreased with depth at all locations. Concentrations increased downgradient at location 16-611017. Therefore, the vertical extent of copper is defined, but the lateral extent is not defined.
- c. Selenium was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at location 16-609185. Selenium was not detected at other downgradient locations.

NMED Comment:

- a. While the detection limits were above BVs, they were only slightly higher than the BVs. However, cadmium was detected above the BV at a concentration of

0.448 mg/kg at location 16-609182 at SWMU 16-026(d). The Permittees must revise the text accordingly.

- b. Concentrations of copper increased with depth at locations 16-01465 and 16-01656. Therefore, the vertical extent of copper is also not defined. The Permittees must revise the text accordingly.
- c. Selenium was detected in samples collected from locations 16-01465, 16-01656, and 16-609185. The Permittees must revise the text accordingly.

25. Section 8.11.5.2, Organic Chemicals, page 168:

Permittees' Statement: RDX was detected at three locations. Concentrations decreased with depth at all locations. RDX was detected in the deepest sample at location 16-609201 (5.5–6.0 ft bgs) but was not detected in nearby location 16-611819 at 8.5–9.0 ft bgs (within approximately 25 ft or less). Concentrations decreased downgradient. Therefore, the extent of RDX is defined.

NMED Comment: Two step-out samples were collected from location 16-611878, east of location 16-611814 at SWMU 16-026(e). RDX concentrations in samples collected (0.0-0.5 ft) from these two locations are higher by more than an order of magnitude in the step-out samples. The lateral extent to the east of location 16-611878 is not defined. The Permittees must propose to collect additional samples to define the lateral extent of RDX contamination.

26. Section 8.12.5.2, Organic Chemicals, page 171:

Permittees' Statement: Acetone was detected at locations 16-01453 and 16-609210. Concentrations did not change with depth at location 16-01453 and decreased with depth at location 16-609210. Acetone was not detected in the next sample location downgradient (16-609189); therefore, concentrations decreased downgradient. Therefore, the vertical extent of acetone is not defined, but the lateral extent is defined.

NMED Comment: It is not clear from the above statement why the Permittees believe that the vertical extent of acetone is not defined at SWMU 16-029(a). Acetone concentrations either did not change or decreased with depth. The Permittees must provide support for their conclusion that the vertical extent of acetone is not defined.

27. Section 8.16.5.1, Inorganic Chemicals, pages 183-186:

Permittees' Statements:

- a. Concentrations increased with depth at locations 16-01439 and 16-609221 (no nearby locations).
- b. Concentrations decreased downgradient to location 16-01439. Therefore, the vertical extent of copper is not defined, but the lateral extent is defined.

- c. Vanadium was detected above the sediment BV at five locations and above the Qbt 2, Qbt 3, and Qbt 4 BV at locations 16-01653 and 16-609219. Concentrations decreased with depth at location 16-01434. Only a surface sample was collected at locations 16-01436, 16-01437, 16-01438, and 16-01439. Location 16-609229, which is within approximately 25 ft of locations 16-01436, 16-01437, and 16-01438, had lower concentrations of mercury at deeper depths.

NMED Comment:

- a. The Permittees state that concentrations decreased with depth at locations 16-01439 and 16-609221, samples were collected from only one depth, i.e., 0.0-0.5 ft at these locations (see Table 8.16-1). Similar statements are made throughout this section and in Section 8.16.5.2. The Permittees must revise the text to indicate that the vertical extent could not be determined because only surface samples were collected at these two locations.
- b. Although concentrations of copper decreased downgradient to location 16-01439, the detected concentration of 90.8 mg/kg is approximately an order of magnitude higher than the BV (11.2 mg/kg). Only one surface sample was collected from location 16-01439, although several inorganic chemicals were detected above the BV (this is the most downgradient location sampled in the shared drainages). In addition, the concentrations of several inorganic chemicals increased significantly downgradient between location 16-609221 and the downgradient location 16-01439. The Permittees must collect an additional sample downstream of this location to define the lateral extent of inorganic chemicals in the drainage during Phase II investigations.
- c. The Permittees must correct the typographical error. The discussion in this paragraph is for vanadium, not mercury.

28. Section 9.2.5.4, Summary of Extent, page 197:

NMED Comment: Several inorganic chemicals were detected above their respective BVs in the surface sample collected at location 16-611439. Bis(2-ethylhexyl)phthalate was also detected in the subsurface sample, indicating that vertical extent of contamination is not defined. The Permittees must propose to collect additional samples south of location 16-611439 to define the vertical and lateral extent of contamination during the Phase II investigations.

29. Section 9.5.5.1, Inorganic Chemicals, pages 205:

Permittees' Statements:

- a. Barium was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at six locations and above the soil BV at one location. Concentrations increased with depth at locations 16-03054, 16-03072, 16-03024, and 16-609477 and decreased with depth at locations 16-609473, 16-03077, and 16-03071. Concentrations decreased downgradient.

- b. Nickel was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at locations 16-03072, 16-03077, and 16-611771. Concentrations decreased with depth at locations 16-03072 and 16-03077 and decreased downgradient (location 16-609462). Therefore, the extent of nickel is defined at locations 16-03072 and 16-03077.
- c. Silver was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at 20 locations. Concentrations decreased with depth and downgradient. Therefore, the extent of silver is defined.

NMED Comments:

- a. NMED could not find location 16-03024 in the associated table or figure for 16-029(x). The Permittees state that concentrations of barium decreased with depth at locations 16-03077 and 16-03071. According to Table 9.5-1, samples from only one depth were collected at these locations. In addition, sample RE16-98-0016 (location 16-05845) is not included in Plate 15. Barium was detected at a concentration of 4,200 mg/kg at this location in a sample collected from a depth of 3.5-4.5 ft. The Permittees must revise the Report accordingly.
- b. The Permittees state that concentrations of nickel decreased with depth at location 16-03077; however, samples were collected from only one depth at this location. The highest detected concentration of nickel (471 mg/kg) was in a sample collected from this location; the vertical extent of nickel is therefore not defined at this location. The Permittees must revise the text accordingly.
- c. Silver was detected at several locations where samples were collected from only one depth. No clear trends were evident. Silver was detected at 49.8 mg/kg at location 16-03174, where samples were collected only from one depth. The Permittees must propose to collect additional samples east of this location to define the lateral extent of silver contamination during the Phase II investigations. In addition, the sampling location 16-05845, where silver was detected at 68 mg/kg, is not depicted in the figure (see Table 9.5-2). The Permittees must revise the Report accordingly.

30. Section 9.8.4.3, Radionuclides, pages 218:

Permittees' Statement: Four soil and six fill samples were collected and analyzed for gamma-emitting radionuclides, isotopic uranium, isotopic plutonium, and americium-241. There were no radionuclides detected or detected above BVs/FVs.

NMED Comment: The Permittees state that samples were collected and analyzed for radionuclides and that none were detected above background at SWMU 16-017(p)-99. However, Table 9.8-1 indicates that samples collected at the site were never analyzed for radionuclides. The Permittees must clarify whether samples were analyzed for radionuclides and revise the text accordingly.

31. Section 11.0, Conclusions, page 258:

NMED Comment: The Permittees must revise their conclusions on nature and extent of contamination for SWMUs and AOCs included in the S-Site Aggregate Area based on comments provided above.

32. Section 12.0, Recommendations, page 264:

NMED Comment: The Permittees must revise their recommendations for SWMUs and AOCs included in the S-Site Aggregate Area based on comments provided above.

33. Figure 7.18.1, Locations Sampled for SWMU 16-004(d), page 364:

NMED Comment: The Figure 7.18-1 depicts the locations of two inactive sludge drying beds (SWMUs 16-004(d) and 16-004(f)). SWMU 16-004(d) is located northeast of SWMU 16-004(f). However, Figure 4.2-3 of the IWP (page 94) depicts SWMU 16-004(f) as located northeast of 16-004(d). The locations of these SWMUs appear to be reversed in the Report. The comment also applies to subsequent figures 7.18-2, 7.18-3, 7.18-4, 7.20-1, 7.20-2, 7.20-3, and 7.20-4. The Permittees must resolve the discrepancy and make appropriate changes to the Report.

34. Table 8.2-3, Summary of Organic Chemicals Detected at SWMU 16-026(z), page 568:

NMED Comment: The Table 8.2-3 reports incorrect depths for some of the sampling locations. For example, the correct depth for sample RE16-10-2889 should be 5.5-6.0 ft, not 0.0-0.5 ft (see Table 8.2-1). Similar errors were noted for samples RE16-10-2890 and RE16-10-2894. The Permittees must revise the table to report correct depths for these samples.

35. Table 8.3-1, Summary of Samples Collected and Analyses Requested at SWMU 16-001(e), page 569:

NMED Comment: The sample collected at location 16-609174 was from 10.0-21.0 ft. In general discrete samples are collected from 1-3 ft intervals. The sample from 10.0-21.0 ft would be considered a composite sample. The Permittees must provide an explanation for selecting such a long depth interval for a discrete sample.

36. Table 8.8-2, Summary of Inorganic Chemicals Detected above BVs at SWMU 16-026(d), page 586:

NMED Comment: The industrial, recreational, and residential soil screening levels (SSLs) listed in the table are incorrect for cyanide (total), fluoride, iron, nitrate, selenium, and uranium. It appears that the data may have been shifted to the right in the spreadsheet. It is noted that this inconsistency does not affect the tables in Appendix H and correction would not result in any changes to the results of the risk assessments. The Permittees must revise the table indicating appropriate SSLs values.

37. Table 8.10-2, Summary of Inorganic Chemicals Detected above BVs or Detected with no BVs at SWMU 16-026(d), page 594:

NMED Comment: The results for chromium, cobalt, and vanadium are discussed in the text but were not included in the table. The Permittees must revise the table to include the analytical results for chromium, cobalt, and vanadium. In addition, sediment BVs must be included in the table to provide reference values for reported sediment samples.

38. Table 8.10-3, Summary of Organic Chemicals Detected at SWMU 16-026(d), page 595:

NMED Comment: The data provided in the table are incomplete; several organic chemicals were omitted. For example, the data for benzoic acid, dibenz(a,h)anthracene, di-n-butylphthalate, diethylphthalate, naphthalene, 2,4,6-trinitrotoluene were not included in the table. In addition, the RDX concentration for the sample collected at location 16-01467 is not reported in the table. It is difficult to follow the discussion of extent of contamination provided in Section 8.10.5.2 with incomplete data in the table. The Permittees must revise the table to include all data discussed in the text.

39. Table 8.17-1, Summary of Samples Collected and Analyses Requested at Liquid Waste Trunk Line, page 619:

NMED Comment: It is not clear why several samples collected from the same depth are assigned different media codes. For example, samples RE16-10-11753 and RE16-10-2967 were both collected from 5.5-6.0 ft at location 16-609232. Sample RE16-10-11753 is reported as a fill sample and sample RE16-10-2967 is reported as a soil sample. The Permittees must resolve or explain the discrepancies, and revise the table accordingly.

40. Table 9.15-3, Summary of Organic Chemicals Detected at the Courtyard Periphery Area, page 685:

NMED Comment: Table 9.15-3 presents an industrial SSL of 42.8 milligrams per kilogram (mg/kg) for 1,1-dichloroethene. This is inconsistent with the industrial SSL of 2,220 mg/kg listed in NMED's *Background Document for Development of Soil Screening Levels, Revision 5.0* (December, 2009). It is noted that this inconsistency does not affect the tables in Appendix H and correction would not result in any changes to the overall conclusions of the risk assessments.

Table 9.15-3 also lists an industrial SSL of 1,530 mg/kg for diphenylamine. This is inconsistent with the industrial Regional Screening Level (RSL) of 1,500 mg/kg. This analyte was not detected in the exposure intervals for the receptors evaluated at this site, and does not affect the results of the risk assessment. The Permittees must revise the table to report correct SSL values.

41. Tables 10.3-2 and 10.3-3, Summary of Inorganic and Organic Chemicals Detected at Martin Spring Canyon Drainages, pages 705 - 730:

NMED Comment: The Permittees divided the data collected in the Martin Spring Canyon Drainages into four areas and depicted each area on a separate plate. However,

the entire data set for the Martin Spring Canyon Drainages was provided in one table making it difficult to review the data. The Permittees must provide separate tables to correspond with plates for each of the four areas.

42. Appendix C, Section C-7.1.9, SWMU 11-011(b), page C-8:

Permittees' Statement: The 5.5- to 6.0-ft-depth intervals were changed to 1.0–1.5 ft at location 11-608812, to 2.0–2.5 ft at location 11-608813, and to 2.5–3.0 ft at location 11-608814.

NMED Comment: The Permittees did not include an explanation for changing the 5.5 to 6.0-ft depth interval proposed in the work plan for samples collected at locations 11-608812, 11-608813, and 11-608814. The Permittees must always report the deviations from the approved work plan and include a reasonable and accurate explanation for the deviation.

43. Appendix C, Section C-7.3.5, SWMU 16-003(f), page C-11:

Permittees' Statement: Location 16-609166 did not originally plot near the associated sump as proposed. After field verification, the sampling point was relocated to immediately outside the sump to be sampled and surveyed.

NMED Comment: The Permittees proposed to collect two subsurface samples below each sump in the approved work plan. In Section 8.6.5 of the Report, the Permittees state that the function of the sump is such that leaks most likely migrate vertically in the unsaturated zone, and that lateral migration is not an expected transport pathway. It is not clear why the sampling point was relocated to outside the sump instead of directly beneath the sump. In addition, sampling location 16-609167 is located several feet away from the sump (Figure 8.6-1). This comment also applies to SWMU 16-003(d), 16-003(e), and SWMU 16-003(g).

44. Table H-2.3-1, EPCs at SWMU 16-004(e) for the Residential Scenario, page H-33:

NMED Comment: The table indicates that nine analyses were conducted on nine samples at SWMU 16-004(e). This is inconsistent with Figure 7.19-2 which indicates that eight analyses were conducted on eight samples collected at SWMU 16-004(e). Similarly, Table H-2.3-2 indicates that five analyses were conducted within the sampling interval for ecological receptors, Figure 7.19-2 indicates that there were four samples collected and analyzed. Clarify these discrepancies.

45. Tables H-2.3-3 and H-2.3-4, EPCs at SWMU 16-026(b) for the Industrial and Residential Scenarios, pages H-34 - H-38:

NMED Comment: The table indicates that an upper confidence level (UCL) was not generated for dibenz(a,h)anthracene and that a maximum detected concentration of 0.19 mg/kg is used for both the industrial and residential exposure point concentrations (EPCs). However, Table H-4.2-5 lists the residential EPC as 0.092 mg/kg, resulting in a possible underestimation of risk. While it is noted that corrective action is proposed for

this site due to elevated risk, this discrepancy should be clarified and the risk calculations revised.

46. Table H-2.3-5, EPCs at SWMU 16-026(b) for the Ecological Receptors, page H-37:

NMED Comment: The table indicates that the maximum detected concentration of benzo(k)fluoranthene (0.86 mg/kg) is used as the EPC for ecological receptors at SWMU 16-026(b). However, the EPC presented on Table H-2.3-5 (0.502 mg/kg) is inconsistent with the maximum detected concentration of 0.86 mg/kg. Clarify this discrepancy and modify any impacted calculations and conclusions as warranted.

47. Tables H-2.3-8, H-2.3.9, H-2.3-10, H-4.2-11, and H-4.2-13, pages H-40 – H-43 and H-52 –H-53:

NMED Comment: The maximum detected concentration (and EPC) of 0.0091 mg/kg listed for 2-methylnaphthalene in all five tables is inconsistent with the maximum detected concentration of 0.00877 mg/kg listed on Table 9.8-3 and Figure 9.8.3. The EPC of 0.0091 mg/kg that was used to estimate hazards is the more conservative of the two concentrations, and would not affect the overall conclusions of the risk assessment. However, the Permittees must resolve this inconsistency.

48. Tables H-4.2-3 and H-4.2-5, Industrial and Residential Screening for Carcinogens for SWMU 16-026(b), pages H-47 – H49:

NMED Comment: 2,4-dinitrotoluene is was not included as a carcinogen in Tables H-4.2-3 and H-4.2-5. The cumulative risk estimates have been slightly underestimated at SWMU 16-026(b) as the cumulative risk estimates currently do not include 2,4-dinitrotoluene. It is noted that addition of 2,4-dinitrotoluene to the carcinogenic risk calculations would most likely not affect the overall conclusions of the risk assessment at SWMU 16-026(b) since 2,4-dinitrotoluene would contribute only a small percentage of the cumulative risk. Nevertheless, the Permittees must revise Tables H-4.2-3 and H-4.2-5 to include 2,4-dinitrotoluene.

49. Table H-4.2-4, Industrial Screening for Noncarcinogens for SWMU 16-026(b), page H-48:

NMED Comment: The industrial SSLs for 4-amino-2,6-dinitrotoluene and 2-amino-4,6-dinitrotoluene appear to be switched. The industrial SSL for 4-amino-2,6-dinitrotoluene should be 1,900 mg/kg, and the industrial SSL for 2-amino-4,6-dinitrotoluene should be 2,000 mg/kg. Modify Table H-4.2-4 accordingly and revise the hazard quotient (HQ) and hazard index (HI) estimates to reflect this change.

50. Table H-4.2-6, Residential Screening for Noncarcinogens for SWMU 16-026(b), page H-50:

NMED Comment: The EPC for cyanide (1.1 mg/kg) is inconsistent with the EPC listed in Table H.2-3.4 (0.647 mg/kg) for the residential scenario. As the EPC used results in a more conservative estimate, the risk assessment results would not be affected by this

inconsistency. However, clarify this discrepancy and revise Tables H-4.2-6 and H.2-3.4 for consistency.

51. Table H-4.2-13, Residential Screening for Noncarcinogens for SWMU 16-017(p)-99, page H-53:

NMED Comment: It is not clear why 2,4,6-trinitrotoluene was listed as a COPC for SWMU 16-017(p)-99 and included on Table H-4.2-13, as this chemical does not appear to have been detected at this site. Revise Table H-4.2-13 accordingly.

Footnote "e" should read "Isopropylbenzene used as a surrogate..." rather than "Pyrene used as a surrogate..." Revise the footnote accordingly.

52. Table H-4.2-15, Recreational Screening for Noncarcinogens for Courtyard Periphery Area, page H-54:

NMED Comment: The recreational SSL for aluminum (79,100 mg/kg) is inconsistent with the recreational SSL listed in *Technical Approach for Calculation Recreational Soil Screening Levels for Chemicals, Revision 1* (February, 2010) of 791,000 mg/kg. As this inconsistency results in a more conservative risk estimate, the overall conclusions are not affected. However, revise Table H-4.2-15 to correct this apparent typographical error. Also, revise the HQ and HI accordingly.

53. Table H-5.4-1, Ecological Screening Levels for Terrestrial Receptors, page H-55:

NMED Comment: The ESLs listed for acenaphthene are incorrect for the deer mouse, desert cottontail, and earthworm receptors. It appears the data are shifted to the right by one cell. However, it appears that the correct ESLs were applied in determination of the HQs in Table H-4.5-3. Update Table H-5.4-1 to show correct ESLs for these receptors.

54. Table H-5.4-4, HQ/HI Analysis for SWMU 16-026(b), page H-59:

NMED Comment: Some of the HI estimates are miscalculated for the American kestrel (top carnivore), American robin (insectivore), and the plant receptor. For the American kestrel (top carnivore), the HI should be 10.7 (instead of the value of 21 presented on Table H-5.4-4); the HI for the American robin is 33 (instead of 45); the HI for the plant receptor is 121.8 (instead of 119). The Permittees must verify the calculation of HIs on Table H-5.4-4 and revise accordingly.

55. Table H-5.4-7, Minimum ESL Comparison for Courtyard Periphery Area, page H-61:

NMED Comment: Table H-5.4-7 indicates that the minimum ESL for flouranthene (10 mg/kg) is based on a montane shrew receptor. This is inconsistent with the information provided in Table H-5.4-1 and the LANL (2009) ECORISK database which indicates that the minimum ESL for flouranthene (10 mg/kg) is based on an earthworm receptor. Revise Table H-5.4.7 to display the appropriate receptor associated with this record.

The Permittees must respond to all comments and submit a revised Report by **January 27, 2011**. 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,



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