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Mr. David Cobrain
New Mexico Environment Department (NMED)
Hazardous Waste Bureau
2905 Rodeo Park Dr. E/Bldg 1
Santa Fe, NM 87505

RE: Draft Technical Review Comments on the "Investigation Report for the S-Site Aggregate Area", Los Alamos National Laboratory, August 2010.

Dear Mr. Cobrain:

Attached please find draft technical review comments on the risk assessments contained within the "Investigation Report for the S-Site Aggregate Area", Los Alamos National Laboratory (LANL), dated August 2010.

Sampling was conducted down gradient 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. In looking at 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 LANL intends to investigate these areas further under a separate investigation; the report iterates several times that these two areas are not specifically defined as a Solid Waste Management Unit (SWMU) or Area of Concern (AOC). However, it is suggested that risk assessments be conducted to evaluate contamination in both the Fishladder Canyon subarea and in the Martin Spring Canyon.

Six S-Site Aggregate Solid Waste Management Units (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 LANL from sampling within this historically protected area, thereby preventing the determination of the nature and extent of contamination for each of the six sites. The report further states that NMED has conditionally approved LANL's proposal to move sampling to the periphery of the V-Site Courtyard. By sampling at the periphery, LANL will only be able to determine whether any contaminants are migrating off-site. Because of the historic nature of the Courtyard Area, LANL occasionally conducts 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 to levels present on-site and in the visiting areas. In addition, it is not clear that

LANL can conclude that there is no risk to visitors to this site as Section 9.15.4 of the report clearly states nature and extent of contamination has not been defined. NMED may wish to caution LANL about opening this area to the public, as risks to an on-site tourist have not been defined. Further, additional sampling and risk evaluation may be warranted to assess levels of contamination outside of the Courtyard Area for exposure to other receptors (e.g., industrial).

Based upon the review of areas where risk assessments were conducted, there appear to be several sampling locations at S-Site Aggregate Area where: 1) surface samples revealed concentrations of inorganic chemicals above background values; 2) surface samples revealed concentrations of organic chemicals retained as chemicals of potential concern (COPCs); 3) no subsurface samples were collected; and/or 4) concentrations of COPCs do not decrease with increasing depth. For example, at SWMU 16-026(b), LANL argues that because deep samples were collected with negative analytical results within 25 feet of these sampling locations, the vertical extent of contamination is defined. In these cases, while we may not agree that the extent of contamination is defined, there does not appear to be an undefined source. These appear to be isolated "hotspots" which may or may not warrant further investigation. NMED may wish to further evaluate the nature and extent of contamination for SWMU 16-026(b).

There was initial concern with SWMUs 16-029(d) and 16-029 (g2) in that only two locations were sampled. However, given the small size of these two units, it appears that two sample locations per site are most likely adequate to assess whether corrective action may be needed.

Overall, the comments associated with the risk assessments were minor in nature and for the most part do not impact the overall conclusions of risk.

If you have any questions, please contact me at (801) 451-2864 or via email at paigewalton@msn.com.

Thank you,

Paige Walton

Paige Walton
AQS Senior Scientist and Program Manager

Enclosure
cc: Neelam Dhawan, NMED (electronic)
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Draft Technical Review Comments on the Investigation Report for the S-Site Aggregate Area, Los Alamos National Laboratory, August 2010

General Comments

1. The construction worker scenario was not included in the risk assessment. The foreseeable reasonable future use of sites in the K-Sites, P-Sites, and 300s Line Subaggregate areas 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 future, intrusive activities may occur in these areas, and as such, the risk assessments must demonstrate that residual contamination is 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 inorganics 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 within the K-Sites, P-Sites, and 300s Line Subaggregate areas at sites 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 K-Sites, P-Sites, and 300s Line Subaggregate areas, the construction worker receptor must be evaluated.

2. Most of the Minimum Detection Levels (MDLs) for cadmium were above the background upper tolerance levels (UTLs) at SWMU 16-026(b). However, due to the high frequency of non-detect results, it is agreed that concentrations of non-detects are likely within background levels. No response to this comment is required.

3. Analytical data from off-site sample locations 16-01457 and 16-609215 at SWMU 16-026(b) are showing evidence of off-site migration of SWMU related contamination. The data also indicate that the 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 may be 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 outside of the SWMU 16-026(b) boundary.

Specific Comments

1. 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 was not used for obtaining the ESLs. Clarify whether this is a typographical error and if not, why the most current ESLs were not applied.

2. Section 8.8.4.2 does not list 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene as COPCs. It is noted that the risk assessment in Appendix H included the evaluation of these

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two COPCs. Modify Section 8.8.4.2 to include 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene as retained COPCs.

3. Section 8.8.5.1 states that, "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." 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. Modify text to state that surface and subsurface samples were collected at location 16-01654, and barium was detected in subsurface soil.

   The text further states that, "The deeper samples at locations 16-609192 and 16-609190 revealed that concentrations decreased with depth." 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 16-609189. Modify the text accordingly.

4. 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 show increasing concentrations downgradient at sample location 16-609190 for the following chemicals: acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, phenanthrene, and pyrene. It appears that initially concentrations are decreasing downgradient from the source, but the concentrations increase again towards the opposite end of the SWMU boundary. Justify whether 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 16-926(b). 2-Amino-4,6-dinitrotoluene was also detected in the subsurface interval 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. Provide justification that the extent of contamination of 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene is defined at SWMU 16-026(b).

5. Table 8.8-2. 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. Verify the data in the table to ensure that appropriate SSLs are listed. 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.

6. 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 2220 mg/kg listed in NMED (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. No response necessary.

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7. Table 9.15-3 lists an industrial SSL of 1530 mg/kg for diphenylamine. This is inconsistent with the industrial Regional Screening Level (RSL) of 1500 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. No response necessary.

8. Table H-2.3-1 indicates that nine (9) analyses were conducted at SWMU 16-004(e). This is inconsistent with Figure 7.19-2 which indicates that eight (8) analyses were conducted from 8 samples that were collected at SWMU 16-004(e). Similarly, Table H-2.3-2 indicates that five (5) analyses were conducted within the sampling interval for ecological receptors and Figure 7.19-2 indicates that there were four (4) samples collected and analyzed. Clarify these discrepancies.

9. Tables H-2.3-3 and H-2.3-4 indicate that a 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 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.

10. Table H-2.3-5 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.

11. Tables H-2.3-8, H-2.3.9, H-2.3-10, H-4.2-11, and H-4.2-13. 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, clarify this inconsistency.

12. Table H-4.2-1. The column heading for the industrial SSLs should read "Industrial SSL" rather than "Residential SSL". Modify Table H-4.2-1 accordingly. No response necessary.

13. Tables H-4.2-3 and H-4.2-5. 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. Revise Tables H-4.2-3 and H-4.2-5 to include 2,4-dinitrotoluene.

14. Table H-4.2-4. 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 1900 mg/kg, and the industrial SSL for 2-amino-4,6-dinitrotoluene should be 2000

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mg/kg. Modify Table H-4.2-4 accordingly and revise the hazard quotient (HQ) and hazard index (HI) estimates to reflect this change.

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

16. Table H-4.2-13. 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. No response necessary.

17. Table H-4.2-13. Footnote "e" should read "Isopropylbenzene used as a surrogate..." rather than "Pyrene used as a surrogate..." Modify the footnote accordingly. No response necessary.

18. Table H-4.2-15. The recreational SSL for aluminum (79,100 mg/kg) is inconsistent with the recreational SSL listed in LANL (2010) of 791,000 mg/kg. As this inconsistency results in a more conservative risk estimate, the overall conclusions are not affected. However, modify Table H-4.2-15 to correct this apparent typographical error. Also, revise the HQ and HI accordingly.

19. Table H-5.4-1. 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 a 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.

20. Table H-5.4-4. Some of the HI estimates are slightly 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). Verify the calculation of HIs on Table H-5.4-4 and modify accordingly.

21. 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 indicate that the minimum ESL for flouranthene (10 mg/kg) is based on an earthworm receptor. Modify Table H-5.4.7 to display the appropriate receptor associated with this record.

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