Response to the Notice of Disapproval for Phase II Investigation Report for the TA-16-340 Complex [Consolidated Units 13-003(a)-99 and 16-003(n)-99 and Solid Waste Management Units 16-003(o), 16-026(j2), and 16-029(f)] Los Alamos National Laboratory, EPA ID #NM0890010515, HWB-LANL-08-032
Dated December 23, 2008

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. *The only area within the Technical Area (TA) 16-340 Complex where industrial risk exceeded the target risk level of 1E-05 was at Solid Waste Management Unit (SWMU) 16-003(o). The primary drivers for the excess risk were benzo(a)pyrene (BaP) and arsenic. The figure that presents the 2008 soil removal locations (Figure 3.1-2) for SWMU 16-003(o), shows an area around the 7500 foot contour line where soils with elevated levels of BaP and arsenic were not excavated (more clearly shown on Figure 2.3-1). The report did not contain a discussion of how the locations for soil removal were determined and why this area of soil with elevated levels of contamination was not included in the corrective action. Based upon the description for this area and from review of the topographic map, the steepness of the area may have been a contributing factor for excluding the area from soil removal. The Permittees must clarify why this area of contaminated soil was not included in the 2008 soil removal activities.*

LANL Response

1. Locations for soil removal at Solid Waste Management Unit (SWMU) 16-003(o) were identified as described in section 9.2 of the Phase I investigation report for the Technical Area 16 (TA-16) 340 Complex (LANL 2006, 091450). Activities were conducted in 2008 in accordance with the NMED approval with modification (NMED 2006, 094381). The 2005 investigation determined that a few areas not among those where soil was removed on the steep hillside also contained elevated concentrations of arsenic and benzo(a)pyrene. These areas were not proposed for removal in the Phase I investigation report because risk calculations indicated that cleanup goals could be attained without removing soil from these locations. Section 4.3.5 has been revised to include this information.

   The risk assessment (Appendix I, section I-4.4.2) conducted as part of the 2008 investigation also indicated the industrial cancer risk slightly exceeded NMED target cancer risk level of 1×10^{-5} as a result of arsenic and benzo(a)pyrene. The cancer risk calculated for this SWMU is overestimated because the contamination is on the steep hillslope where industrial activities are not likely to occur.

   The risk assessment (Appendix I, section I-4.4.2) indicated that the arsenic exposure point concentration (EPC) at SWMU 16-003(o) is similar to background concentrations. In addition, benzo(a)pyrene is a polycyclic aromatic hydrocarbon found in asphalt. The presence of this

compound is probably due in part to runoff from nearby roads, as evidenced by the asphalt pieces observed on the hillslope during removal activities.

NMED Comment

2. *As part of the assessment of the potential for contaminants to migrate to groundwater, pore water concentrations were compared to derived screening levels. These screening levels are dependent on the Henry's Law constant for individual constituents. The physical and chemical properties for the constituents detected in pore water were obtained from either the New Mexico Soil Screening Levels (NMED SSLs) Guidance document or the Pennsylvania Department of Environmental Protection chemical and physical properties database. For the ecological screening assessment, physical and chemical properties were taken from the Risk Assessment Information System (RAIS) database. It is not clear why the Pennsylvania database was used over the Region 6 medium-specific screening level (MSSL) database or why multiple databases were applied for physical and chemical data. While no real discrepancies were noted, the Permittees must clarify the rationale for the use of different databases in the same assessment.*

LANL Response

2. The reference to the Pennsylvania Department of Environmental Protection database in section I-3.2.2.1 and Table I-3.2-3 has been deleted. The text now indicates that all Henry's law constants were obtained from NMED guidance (NMED 2006, 092513). A note has also been added to Table I-3.2-3 stating that the Henry's law constants are taken from NMED guidance.

   Physical and chemical properties were not used in the ecological screening assessment but were used in the discussion of environmental fate and transport (section I-3.2). As in previous risk appendixes, the Risk Assessment Information System (RAIS) database (http:/rais.ornl.gov/cgi-bin/tox/TOX_select?select=nrad) is the primary source of physical and chemical property data because it is a comprehensive, readily accessible, and user friendly database. The U.S. Environmental Protection Agency database (http:/www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm) is the secondary source, and other sources are used as necessary to obtain data for a particular chemical.

NMED Comment

3. *It is noted that the Permittees applied either United States Environmental Protection Agency (EPA) Region 6 media-specific screening levels (MSSLs) or EPA Region 9 preliminary remediation goals (PRGs), if NMED SSLs were not available. This hierarchy of screening levels is based on the March 1, 2005, Order on Consent (Section VIII). In July 2008 (and updated in September 2008), Regional Screening Levels (RSLs) were posted as inter-regional screening levels for EPA Regions 3, 6, and 9. These new RSLs supersede the previously used MSSLs and PRGs. As noted on the regional web pages, use of the individual regional screening levels should be discontinued. The RSLs are posted at (http://www.epa.gov/region09/waste/sfund/prg/rsl-table.html or http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm). The Phase II investigations were conducted between June and August of 2008. Thus, the risk evaluation would have been conducted after August 2008 and the new RSLs should have been applied. A preliminary comparison of the screening levels used in the report to the RSLs (where a MSSL or PRG was applied) was conducted. Since the assessment as presented in the report is conservative (i.e., use of a RSL would not result in a higher risk/hazard), no modification of the screening is warranted. Please note that for all future risk evaluations the RSLs should be used over either MSSLs or PRGs.*

LANL Response

3. Per NMED's comment, the screening assessments have not been modified. The U.S. Environmental Protection Agency (EPA) Regions 6 and 9 screening levels were used in the Phase II risk screening assessments to be consistent with the original assessments presented in the 2005 TA-16-340 Complex investigation report (LANL 2006, 091450). The regional screening levels will be used for all future risk screening assessments.

NMED Comment

4. *A complete exposure pathway is defined for a construction worker, but not evaluated. Risks to a construction worker may occur upon further development of this site. The Permittees were directed to evaluate a construction worker scenario for the 16-340 Complex in the approval letter for the Investigation Work Plan that was issued on June 28, 2004. The Permittees state that they will also evaluate the construction worker scenario and provide the results to construction/D&D organizations prior to conducting any construction work at the site. The Permittees must conduct a construction worker evaluation and include it in the revised Report, even if future development of the site is not immediately anticipated.*

LANL Response

4. The construction worker scenario has been evaluated for each site and is presented in the revised Appendix I and in section 7.2.1 of the main text. The risk screening assessments were conducted in accordance with the Permittees response to the notice of disapproval (LANL 2004, 087345) for the investigation work plan (LANL 2004, 087345; NMED 2004, 091143) and as presented in the original investigation report (LANL 2006, 091450).

NMED Comment

5. *NMED will include the requirements and schedule for groundwater, surface water and pore gas monitoring at the time of approval of the Report. No response is required.*

LANL Response

5. Comment noted.

SPECIFIC COMMENTS

NMED Comment

1. ***Section 4.7, Surface Water Conditions, Page 23:***

   The erosion potential (EP) scores reported in the Draft NPDES permit are different from the values reported in this Investigation Report. Appendix A of the Draft NPDES permit reports an EP value of 70.0 for SWMUs 16-003(n) and 16-003(o), and a value of 67.0 for SWMU 16-026(j2). These latest surface water assessments indicate a high potential for erosion from these sites. Revise the text and associated surface water assessment for these sites based on the most recent EP scores.

LANL Response

1. LANL has revised the surface water assessment erosion potential scores. Selected sites within the TA-16-340 Complex were reevaluated in 2008. Under the new assessments, SWMUs 16-003(n), 16-003(o), and 16-026(j2) were assigned higher erosion potential scores of 70, 70, and 67, respectively. This information has been included in the section 4.7 of the revised investigation report.

NMED Comment

2. ***Table 5.2-1, Summary of Human Health Screening Levels for Chemicals and Radionuclides, Pages 65-68:***

   Minor editorial comments were noted with the footnotes on Table 5.2-1: carbon disulfide does not require a footnote; a footnote "a" should be added to 1,3-dinitrobenzene; and a footnote "a" should be added to 1,3,5-trinitrobenzene. Revise the table accordingly.

LANL Response

2. Table 5.2-1 has been revised based on the above comment as well as General Comment 4. The table now includes construction worker soil screening levels (SSLs).

NMED Comment

3. ***Appendix H, Analytical Data Review and Assessment, Section H-8.3.1, Page H-28:***

   Permittees Statement: *The lateral extent of barium and copper is also defined because barium and copper were detected at lower concentrations at 2008 boreholes 16-603400 and 16-603401, located downgradient of the sumps and at the top end of the former fishladder Structure.*

   NMED Comment: *Copper was detected at 33 mg/kg at sampling location 16-603400; that is higher than most of the detected concentrations reported for copper at the former sumps. Revise the text accordingly.*

LANL Response

3. Copper was detected in the alluvium at a concentration of 182 mg/kg at location 16-24894 in SWMU 16-003(o)-west. This is the highest concentration of copper at SWMU 16-003(o)-west. The 33 mg/kg in the alluvium at downgradient location 16-603400 represents a lateral decrease in copper concentration from location 16-24894. This information has been included in the revised text in section H-8.3.1.

NMED Comment

4. ***Appendix H, Analytical Data Review and Assessment, Section H-8.3.1, Page H-31:***

   Permittees Statement: *The lateral extent is defined at the former fishladder structure because arsenic was not detected at the most downgradient 2008 locations (16-603406 and 16-603407), it was also detected at lower concentrations at historical locations 16-25651 and 16-25653.*

   NMED Comment: *Arsenic was detected at historical locations 16-23651 and 16-23653, and not at locations 16-25651 and 16-25653. Correct the typographical error.*

LANL Response

4. The location numbers in section H-8.3.1 have been corrected to indicate arsenic was detected at lower concentrations at historical locations 16-23651 and 16-23653.

NMED Comment

5. ***Appendix H, Analytical Data Review and Assessment, Section H-8.3.2, Page H-34:***

   Permittees Statement: *Acetone was detected in multiple historical and 2008 samples. The maximum concentration (0.212 mg/kg[J]), was detected at historical location 16-603406.*

   NMED Comment: *Acetone was not detected at historical location 16-603406 but was detected at location 16-24906 (0.212 mg/kg). Location 16-603406 is not a historical location, but a 2008 sampling location. Revise the text accordingly.*

LANL Response

5. The text in section H-8.3.2 has been revised to indicate acetone was detected at 0.212 mg/kg at historical location 16-24906.

NMED Comment

6. ***Appendix H, Analytical Data Review and Assessment, Section H-8.3.2, Page H-36:***

   Permittees Statement: *Acetone and propylene concentrations decreased from July 2008 to August 2008 in borehole 16-603511. Acetone and propylene were either not detected or were reported at low levels during 2005 sampling at boreholes 16-23691 and/or 16-23693.*

   NMED Comment: *Above statement is inaccurate. Acetone and propylene concentrations increased from July 2008 to August 2008, not decreased at depths of 95-103 ft (see Table H-5.4-1) in borehole 16-603511. Contrary to the above statement, acetone was detected in a poregas sample obtained from borehole 16-23691 (175-176 ft) at 285 µg/m^3 in 2005; this was the highest detected concentration of acetone. Resolve the discrepancies and revise the text accordingly.*

LANL Response

6. Acetone and propylene concentrations increased to the bottom depth of 196.5 to 203 ft below ground surface (bgs) in borehole 16-603511 in the July 2008 samples. Acetone and propylene were not detected at the bottom depth in the same borehole in the August 2008 samples. Acetone was detected at a maximum concentration in pore gas in borehole 16-23691 at the bottom depth sampled (175 to 176 ft bgs) in 2005. Concentrations also increased to the bottom depth sampled (199 to 200 ft bgs) in the same borehole in 2004. Acetone concentrations did not vary substantially in borehole 16-23692 and were lowest at the top and bottom depths. Propylene was not detected in boreholes 16-23691 and 16-23692 in the 2004 and 2005 samples. This information has been included in section H-8.3.2.

NMED Comment

7. ***Appendix H, Analytical Data Review and Assessment, Section H-8.4.1, Page H-38:***

   Permittees Statement: *Five of these 11 inorganic COPCs (barium, chromium, copper, nickel, and perchlorate) listed above were not detected during 2008 investigation, either at downgradient locations or at deeper depths, from the historical contamination.*

   NMED Comment: *Chromium was detected at 8.34mg/kg at location 16-603405 during 2008 investigations (see Table 6.3-9). Perchlorate was not analyzed for during 2008 investigations. Revise the text and Plate 6 accordingly.*

LANL Response

7. Plate 6 has been revised to include the chromium concentration of 8.34 mg/kg detected at a depth of 1.5 to 2.0 ft at location 16-603405. The text in section 8.4.1 has also been revised to include the chromium concentration and to note that not all samples were analyzed for perchlorate during the 2008 investigation at SWMUs 16-026(j2) and 16-029(f).

NMED Comment

8. ***Appendix H, Analytical Data Review and Assessment, Section H-8.5.1, Page H-42:***

   Permittees Statement:

   a. *Arsenic, mercury, and thallium were only detected in one or two samples, and they were not detected in the downgradient well.*
   b. *Cobalt showed a general increasing trend in concentrations from the upgradient to the downgradient well.*
   c. *Manganese was detected at elevated concentrations in the middle alluvial well.*

   NMED Comment:

   a. *Arsenic was detected in only two samples, but was detected in the downgradient well (see Table 6.5-1).*
   b. *Cobalt was detected at maximum concentrations in the middle alluvial well (i.e., 16-25279).*
   c. *Manganese was detected at the maximum concentrations in samples collected from the most downgradient well (16-25278), and not the middle alluvial well (16-25279).*

   Revise the text accordingly.

LANL Response

8. The text in section H-8.5.1 has been revised to accurately present the concentrations for arsenic, cobalt, and manganese in the three alluvial groundwater wells.

NMED Comment

9. Appendix H, Analytical Data Review and Assessment, Section H-8.5.4, Page H-43:

Permittees Statement: *Beryllium, cadmium, chromium, cobalt, copper, cyanide, iron, lead, manganese, nickel, silicon dioxide, silver, strontium, sulfate, tin, uranium, vanadium, and zinc were detected at lower concentrations downstream in Fishladder Canyon at Cañon de Valle (based on one of the two samples collected at Fishladder Canyon at Cañon de Valle).*

NMED Comment: *Review of the data presented in Table 6.5-1 does not support the above statement. For example, one filtered sample collected at the downgradient location (at the confluence of Fishladder Canyon and Cañon de Valle) contained highest concentrations of iron, strontium, vanadium, and zinc. There were no clear trends for lead. The unfiltered sample collected at the same location contained highest concentrations of most of the inorganic chemicals. Revise the statement to reflect the detected concentrations accurately.*

LANL Response

9. The text in section H-8.5.4 has been revised to accurately present the inorganic chemical concentrations in filtered and unfiltered surface water samples at Fishladder Spring and Fishladder Canyon at Cañon de Valle.

NMED Comment

10. Appendix I, Section I-4.3, SWMU 16-003(o), Page I-13:

Permittees Statement: *For SWMU 16-003(o), arsenic and benzo(a)pyrene have EPCs above their respective SSLs (Table I-4.3-11).*

NMED Comment: *The exposure point concentration (EPC) for arsenic is 10.2 mg/kg, which is below the Industrial Soil Screening Level (SSL) of 17.7mg/kg. Revise the text accordingly.*

LANL Response

10. The text in section I-4.3 has been revised to indicate the exposure point concentration for arsenic is not above the industrial SSL.

NMED Comment

11. Appendix I, Section I-5.4.8, Pages I-23 through I-26:

Several constituents were eliminated as constituents of potential ecological concern (COPEC) due to low detection frequencies, low potential for toxicity, and/or no available ecological screening level (ESL) in the Ecorisk database.

a. Constituents that have historically been used at a site and/or potentially are present due to site activities should not be excluded from a risk assessment based on a low frequency of detection. As historical data are not available to demonstrate that these constituents are not potentially site-related, the use of low detection frequency should not be used as a line of evidence for eliminating the constituents as a COPEC. The constituents must be retained as a COPEC and discussed in the uncertainty analysis. The Permittees must revise the text accordingly.

b. *Constituents must also not be excluded based on the constituent not being included in the Ecorisk database or because a surrogate screening level was applied. Where an ESL is not available in Ecorisk database, other sources, such as the EPA's Integrated Risk Information System (IRIS) should be used to obtain toxicological data. When a surrogate screening level is applied, the constituent must be retained and the associated risk addressed in the uncertainty analysis.*

LANL Response

11. No revisions to section I-5.4.8 are necessary because the chemicals of potential ecological concern (COPECs) without ecological screening levels (ESLs) are discussed in the uncertainty analysis, which is where the comment indicates the discussions should be.

    a. The chemicals of potential concern (COPCs) without ESLs are retained as COPECs in the initial screening assessment, which states they are discussed further in the uncertainty analysis in section I-5.4. Section I-5.4.8 is the discussion of COPECs without ESLs and is part of the uncertainty analysis where these COPECs are evaluated qualitatively using lines of evidence to indicate whether they pose potential risks to ecological receptors. Among the lines of evidence used is the frequency of detection. The qualitative assessment evaluates COPECs that are infrequently detected (one to seven detects for this site) at low levels. The infrequent detection across the 1.1-hectare TA-16-340 Complex site makes exposure and effects to ecological receptors unlikely. In addition to the site conditions, an evaluation of the relative toxicity of the COPECs without ESLs using either surrogates or human health risk-based values provides a basis for determining whether these COPECs are likely to affect ecological receptors. Based on these lines of evidence, COPECs without ESLs do not pose a potential risk to ecological receptors at the TA-16-340 Complex and are eliminated.

    b. As stated above, section I-5.4.8, which discusses COPECs without ESLs, is part of the uncertainty analysis where these COPECs are evaluated qualitatively using several lines of evidence to indicate whether there are potential risks to ecological receptors.

       The use of surrogate chemicals with ESLs or with human health risk-based screening levels is appropriate no other information is available to assess potential risk to receptors. If the surrogate ESLs and/or the most conservative human health screening values (i.e., residential) indicate that toxicity is not an issue, then it can be concluded the COPEC without ESLs is also not likely to affect receptors. This is a common practice, and surrogates were used in the human health screening assessments for these sites for several COPCs.

       The Ecorisk Database uses a variety of literature sources, including the IRIS Database, to obtain toxicity information to develop ESLs. The presence of toxicity information either in IRIS, in the peer-reviewed literature, or in other literature sources/databases does not automatically yield ESLs for a chemical. The process for developing ESLs is well established and involves a thorough and careful review of information from numerous sources, a process similar to EPA's for developing Eco-SSLs. Chemicals do not have ESLs because acceptable toxicity data are not available, the chemicals have not been priorities for developing ESLs, or both. Some chemicals are detected infrequently, are present at low or trace levels when they are detected, and in some cases, have surrogates that can be used. The rationale for eliminating these COPECs as described in section I-5.4.8 is sound. The low frequency of detection, low or trace levels detected, and the relative toxicity of surrogate ESLs and/or human health screening levels provide a weight of evidence, which indicates no potential risk to receptors. Based on these factors, it is appropriate to eliminate these chemicals as COPECs.

The Ecorisk Database is periodically revised and updated. The process for incorporating new toxicity information entails searching the literature, obtaining copies of the papers, reviewing and rating the papers to determine if they contain relevant toxicity information, developing toxicity reference values, and calculating ESLs. In subsequent revisions to the database, the chemicals that are detected infrequently in samples will be investigated to determine whether applicable toxicity information is available to develop ESLs. It should be noted that EPA also has not developed Eco-SSLs for these and a large number of other chemicals for similar reasons.

NMED Comment

12. Appendix I, Table I-2.3-1, Consolidated Unit 13-003(a)-99, Page I-40:

The exposure point concentration (EPC), the maximum detected concentration for benzo(a)pyrene should be 0.135mg/kg, not 0.22mg/kg as reported (see Table H-3.2-1). Revise the table and associated risk screening.

LANL Response

12. Table I-2.3-1 and the associated text have been revised.

REFERENCES

LANL (Los Alamos National Laboratory), March 2004. "Investigation Work Plan for the TA-16-340 Complex, Solid Waste Management Units 13-003(a)-99, 16-003(n)-99, 16-003(o), 16-026(j2), and 16-029(f) at Technical Area 16," Los Alamos National Laboratory document LA-UR-04-1466, Los Alamos, New Mexico. (LANL 2004, 087345)

LANL (Los Alamos National Laboratory), January 2006. "Investigation Report for the TA-16-340 Complex [Consolidated Units 13-003(a)-99 and 16-003(n)-99 and Solid Waste Management Units 16-003(o), 16-026(j2), and 16-029(f)]," Los Alamos National Laboratory document LA-UR-06-0153, Los Alamos, New Mexico. (LANL 2006, 091450)

NMED (New Mexico Environment Department), June 28, 2004. "Approval of the Investigation Work Plan for the TA-16-340 Complex, Solid Waste Management Units 13-003(a)-99, 16-003(n)-99, 16-003(o), 16-026(j2), and 16-029(f) at Technical Area 16," New Mexico Environment Department letter to D. Gregory (DOE LASO) and G.P. Nanos (LANL Director) from D. Goering (NMED-HWB), Santa Fe, New Mexico. (NMED 2004, 091143)

NMED (New Mexico Environment Department), June 2006. "Technical Background Document for Development of Soil Screening Levels, Revision 4.0, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document," New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2006, 092513)

NMED (New Mexico Environment Department), October 25, 2006. "Approval with Modifications, Investigation Report for the TA-16-340 Complex [Consolidated Units 13-003(a)-99 and 16-003(n)-99 and Solid Waste Management Units 16-003(o), 16-026(j2), and 16-029(f)]," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2006, 094381)