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TA-16

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

December 23, 2003

David Gregory, Program Manager
Los Alamos Site Office
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, NM 87544

G. Pete Nanos, Director
Los Alamos National Laboratory
P.O. Box 1663, Mail Stop A100
Los Alamos, NM 87545

RE: NOTICE OF DEFICIENCY
PHASE III RFI REPORT FOR
SOLID WASTE MANAGEMENT UNIT 16-021(c)-99
LOS ALAMOS NATIONAL LABORATORY (LANL), NM0890010515
HWB-LANL-03-011

Dear Mr.Gregory and Mr. Nanos:

The New Mexico Environment Department (NMED) is in receipt of the Phase III RFI Report for Solid Waste Management Unit 16-021(c)-99, dated September 2003 and referenced by LA-UR-03-5248 (ER2003-0480). NMED has reviewed this document and is issuing a notice of deficiency. LANL must respond to the comments as outlined in the Attachments 1 and 2 to this letter within thirty (30) days of receipt of this letter. Attachment 1 provides comments on the main body of the RFI report. Attachment 2 provides comments on the report's appendices.

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Should you have any questions, please feel free to contact Ms. Darlene Goering of my staff at (505) 428-2548.

Sincerely,

Sandra Martin
Acting Chief
Hazardous Waste Bureau

SM:dxg

cc: M. Leavitt, NMED SWQB
J. Schoeppner, NMED GWQB
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file: Reading and LANL (Building 260 Outfall, Cañon de Valle, Martin Spring Canyon)

ATTACHMENT 1

General Comments:

1. The geochemical evaluation that LANL conducted comparing naturally occurring concentrations of inorganic chemicals was performed for alluvial groundwater, surface water, and spring water due to the lack of an appropriate background data set. The data used in the analyses are the same data used to assess parameters such as extent of contamination and rate of contaminant migration as part of this RFI. The data were collected from areas of known contamination downgradient from known contaminant sources. RAGS guidance considers appropriate background data as data collected from areas that are not influenced or potentially influenced by site contamination. The concentrations that LANL determined were naturally occurring for several elements are not derived from uncontaminated samples. The elements should not have been eliminated from further risk consideration based on this reason alone. For example, silver was eliminated from further consideration in Cañon de Valle surface water when 1) the data is collected downgradient from a known source of silver contamination (SWMU 16-020, also known as the "silver outfall") and 2) detected silver concentrations in surface water exceed the NMWQCC groundwater standard, and the EPA MCL. LANL shall revise its human health risk assessment to include these elements.

2. The Executive Summary of the report implies that there are no radionuclides of concern at the site. However, the risk assessment includes several radionuclides in its analyses. The Executive Summary and discussion of the nature and extent of contamination must be revised to address the potential radiological constituents of concern.

Specific Comments:

1. Executive Summary (Ecological Risk – Cañon de Valle), pg. vi:

LANL Statement: "The ecological assessment of the aquatic system in the canyon found some differences between benthic macro-invertebrates in Cañon de Valle and reference canyons, though these results were not replicated in a subsequent toxicity test, indicating high variability in the contaminant signatures for this sediment. The toxicity testing for Cañon de Valle shows potential impacts relative to the reference site in Starmer's Gulch, although the sediment is heterogeneous with regard to potential toxic effects. In Cañon de Valle, a viable benthic macro-invertebrate community is present, which is a meaningful indicator that site contaminants cause negligible ecological effects."

NMED Comment: The results from toxicity data collected in Cañon de Valle near SWSC cut indicated that high concentrations of RDX and silver in sediment were probably impacting the system. The results could not be replicated due to many possible factors including drought conditions, laboratory problems, or localized "hot spots" of concentrations. Based on these

toxicity data and the heterogeneity of these contaminants, LANL should propose "hot spot" removal near SWSC cut as part of the reduction in overall risk.

2. Section 1.3.1 Source Area Investigation, pg. 1-12, paragraph 4:

LANL Statement: "However, thin surge bed deposits were reported in BH 16-06370, drilled into the center of the former settling pond during the IM (see section 1.3.4 of the IM report)".

NMED Comment: Section 1.3.4 does not exist in the referenced report. LANL shall correct the reference or provide the details of the drilling as part of this response.

3. Section 1.5 COPC Screening Methodology for Human Health Risk, pg. 1-17, paragraph 2:

LANL Statement: "Additionally, calcium, sodium, magnesium, potassium, and iron are essential nutrients and are eliminated from human health risk assessment."

NMED Comment: While studies have indicated that calcium, sodium, and potassium are relatively non-toxic, studies have also shown there to be an upper intake limit for iron and magnesium. The United States Department of Agriculture Food Safety and Inspection Service and the National Academy of Science Food and Nutrition Board have developed upper intake levels (ULs), which should be applied in determining a soil screening level (SSL) that, in turn, should be used in assessing essential nutrients toxicity. If site concentrations of iron and magnesium are below this SSL, then they may be eliminated from further consideration in the risk assessment. LANL shall revise the report accordingly.

4. Section 1.5.1 Frequency of Detection, pg. 1-18, paragraph 3:

LANL Statement: "In addition, most chemicals that were analyzed for a particular medium in more than 20 samples, but reported or detected in less than 5% of the samples, also are eliminated. Based on RAGS guidance these chemicals may be considered data sampling artifacts that do not represent the site's true conditions (EPA 1989, 08021)."

NMED Comment: Based on RAGS guidance, any detection frequency used should be approved prior to using it as part of a screening. If LANL is going to use the RAGS guidance in its risk assessment process, LANL shall obtain approval from NMED prior to using a specific detection frequency at a specific site.

5. Figure 1.5-2 COPC Screening Methodology for Water, pg. 1-20 and Section 1.5.3 Comparison to Regulatory Standards (Water Only), pg. 1-21:

NMED Comment: The flow diagram and the text indicate that NMWQCC standards and/or MCLs will be used as the primary screening values to determine whether a chemical should be carried forward in the risk assessment. However, the NMWQCC standards and MCLs are not

solely risk-based numbers, but also incorporate technology limitations and, as such, comparison of site data to these numbers will not provide an indication of whether there is acceptable risk. The use of these values may be helpful as a tool, if no risk-based screening numbers are available or for assessing remediation alternatives, but should not be used to select COPCs for use in a baseline risk assessment. Rather, the selection of COPCs for water should primarily be based upon comparison to the EPA residential tap water screening levels (either Region 6 or Region 9), as noted on the left side of the flow diagram. If there are no tap water screening levels available, and toxicological data are not available to support the derivation of the tap water screening values, then the NMWQCC and/or MCL may be appropriate for use. LANL shall revise the diagram and the selection of COPCs accordingly.

6. Section 1.5.3 Comparison to Regulatory Standards (Water Only), pg. 1-21, paragraph 3:

LANL Statement: "SW standards derived for the protection of human health and fisheries are also not applicable to Cañon de Valle and Martin Spring Canyon surface water because the morphology of the stream does not allow water to pool. Therefore no habitat exists to support fish in these systems and human consumption of SW is unreasonable for the canyon systems."

NMED Comment: Currently, surface water standards for persistent chemicals that were derived for the protection of human health apply to <u>all</u> tributaries of surface water throughout the state to protect downstream habitats, regardless of whether or not fish exist or the habitat for fish exists. LANL shall revise this report to use these standards for comparison to determine potential impacts to the surface water in these canyon systems.

7. Section 1.5.3 Comparison to Regulatory Standards (Water Only), pg.1-22, paragraph 1:

LANL Statement: "Chemicals for which there is neither a regulatory standard nor a PRG are retained as COPCs and subsequently evaluated in the human health and ecological risk assessments or, if one is available and appropriate, a surrogate chemical is assigned."

NMED Comment: The list of surrogate chemicals provided by LANL for use at this site is acceptable with the following exceptions:

- The suggested surrogate for acenaphthylene is pyrene.
- The suggested surrogate for phenanthrene is pyrene.
- The suggested surrogate for endosulfan sulfate is endrin.
- The suggested surrogate for 2-nitrophenol is 2-chlorophenol.

LANL shall revise this report to include the suggested surrogates.

8. Table 3.3-1 Summary of Annual Sampling and Analysis of Surface Water in Cañon de Valle and Martin Spring Canyon, pg. 3-9:

NMED Comment: LANL shall explain why only a portion of the Cañon de Valle surface water samples were analyzed for HE, nitrate/nitrite, anions, perchlorate, and alkalinity. LANL shall describe how many samples were analyzed for each of the analytes listed above.

9. Section 3.4.2.1.1 Cañon de Valle Surface Water: Evaluation of Inorganic Chemicals, pg. 3-27, paragraph 1:

LANL Statement: "This section includes the frequency of detected inorganic chemicals (Table 3.4-1); the screening results for inorganic chemicals that exceed the NMWQCC regulations numeric standard or other appropriate standard (Table 3.4-2); and the inorganic chemicals retained and eliminated as COPCs (Table 3.4-3)."

NMED Comment: In addition to these standards, LANL should be using the acute aquatic life standards (20.6.4 NMAC). LANL shall revise the report accordingly.

10. Table 3.4-2 Screening of Inorganic Chemicals Detected in Cañon de Valle Surface Water Samples, pg, 3-30:

NMED Comment: The table provides a column for EPA Region 6 tap water preliminary remediation goals (PRGs); however, for most chemicals, Region 6 PRGs were deemed "not applicable". It appears that the PRGs were only presented on the table if the NMWQCC and/or MCLs were not available. As noted in a previous comment (see Specific Comment #5), the PRGs should be the primary screening level used in determining COPCs for use in a risk assessment. Thus, the Region 6 tap water PRGs should be listed in the table. According to the protocol outlined in Section 1.5 of this report, if Region 6 PRGs are not available, Region 9 tap water PRGs would be used. It is noted that for arsenic (both maximum detected and maximum undetected values) and the maximum detected iron, were eliminated from further evaluation based upon the comparison to the MCL; however, the reported chemical concentrations were above the Region 9 tap water PRGs. Therefore, arsenic and iron should have been retained as COPCs. LANL shall revise the table to include all available Region 6 tap water PRGs and Region 9 tap water PRGs for those chemicals without an associated Region 6 value and modify the list of COPCs and risk calculations accordingly.

11. Table 3.4-3 Retained and Eliminated Inorganic Chemicals in Cañon de Valle Surface Water Samples, pg. 3-32:

NMED Comment: LANL shall explain why silver is retained as a COPC even though it was determined that "the concentrations are within the naturally-occurring concentration range" and other chemicals were eliminated for the same reason.

12. Table 3.4-5, Screening of Organic Chemicals Detected in Cañon de Valle Surface Water Samples, page 3-35:

NMED Comment: Similar to Specific Comment #10, Region 6 tap water PRGs were, for the most part, not provided and Region 9 tap water PRGs were not included in the table for those chemicals without an associated Region 6 tap water PRG. The maximum undetected values of naphthalene, tetrachloroethene and trichloroethene exceeded their respective Region 9 tap water PRGs. While tetrachloroethene and trichloroethene were retained for further analysis, naphthalene was eliminated from consideration. Even though the justification for eliminating naphthalene was due to infrequent detections, the fact that naphthalene was detected above acceptable risk levels and that other PAHs have been selected as COPCs in other media is sufficient justification to retain naphthalene for additional analysis. Additionally, consistent methodology should be followed: other infrequently detected constituents exceeding screening limits were retained as COPCs (i.e., methylene chloride and nitroglycerine). LANL shall revise the table to include all Region 6 tap water PRGs, and Region 9 tap water PRGs for those chemicals without an associated Region 6 value, and modify the list of COPCs and risk calculations accordingly.

13. Section 3.4.2.5.3 Martin Spring Canyon Alluvium, Sediment and Tuff: Evaluation of Inorganic Chemicals, pg. 3-84:

NMED Comment: LANL shall describe the distinction (and the significance of the distinction) between the alluvium and sediment media and explain why there is no distinction made in Cañon de Valle. The background value used is the same for both alluvium and sediment.

14. Table 3.4-44 Table of Retained COPCs for Cañon de Valle and Martin Spring Canyon, pg. 3-110:

NMED Comment: Cyanide was detected above the WQCC standard (5.2 ppb) for wildlife habitat during the Phase II RFI and in several of those instances the detection limits were above the standard or background level (soil and tuff). Cyanide is also considered a potential contaminant of concern following the Cerro Grande Fire. LANL shall explain why most of the samples were not analyzed for cyanide.

15. Section 4.1 Summary, pg, 4-1, paragraph 6:

LANL Statement: "A fifth well (Well 16-02712) was located in the Cañon de Valle upper drainage channel, downstream of the former settling pond. This well was plugged and abandoned during the IM in 2000."

NMED Comment: There is no mention of plugging and abandoning this well in the IM report and the details are not provided in this report. LANL shall describe the well abandonment activities to include, well abandonment method used, any problems encountered, and any deviations from current EPA well abandonment guidance.

16. Section 4.1 Summary, pg. 4-7, paragraph 1:

LANL Statement: "If the saturated pathways connecting the 260 outfall to the springs are identified and if they contain constituents at levels greater than MCLs, then implement groundwater monitoring in those pathways."

NMED Comment: LANL shall implement groundwater monitoring at the springs if <u>any</u> constituents are detected above detection limits or background levels. Exceedances above the standards (i.e., MCLs) do not determine the need for monitoring. More frequent monitoring shall occur when contamination is detected to evaluate the need for remediation.

17. Section 4.4.2.1.1 Springs – Evaluation of Inorganic Chemicals, pg.4-25:

LANL Statement: As noted in the Phase II RFI report (LANL 1998; 59891), the concentrations of many metals at the TA-16 springs are higher than in background springs (i.e., Apache Spring, Cañon de Valle Spring, Water Canyon Gallery, Pike Spring, and Seven Springs) upgradient from Laboratory property, indicating many of these metals are anthropogenic in origin. Such comparisons, however, must be viewed with caution since the background springs are from the Sierra de los Valles mountain front, whereas the TA-16 springs are located on the Pajarito Plateau in a different geologic setting."

NMED Comment: LANL has not shown that the geologic setting of the background springs is so much different from that found on the Pajarito Plateau that the two data sets aren't comparable. In addition, there are available data from springs within the laboratory boundary that are upgradient of laboratory operations. LANL should have used this data for comparison of contaminant concentrations instead of performing the geochemical evaluation (see also General Comment #1).

18. Table 4.4-4 Frequency of Detected Organic Chemicals in Spring Samples from Quarterly Sampling from March 1998 through July 2002, pg. 4-26:

NMED Comment: The table shows samples analyzed for organics as filtered and unfiltered. Samples analyzed for organic chemicals should never be filtered. The results obtained from filtered organic samples have been compromised by the act of filtering and are not valid. LANL shall not consider any organic chemical data collected from filtered samples in its risk assessments or decision-making process for this report.

19. Table 4.4-13 Frequency of Detected Organic Chemicals in 90s Line Pond Samples, March 1998 through July 2002, pg. 4-44:

NMED Comment: See Specific Comment #12.

20. Section 5.2.2 Component 2 – Mesa Vadose Zone, pg. 5-5, paragraph 4:

LANL Statement: "Finally, the presence of HE contamination in the approximately 700-ft perched aquifer at Regional Aquifer Well R-25 (LANL 2003, 75986.2) indicates that these

transport pathways may extend from the mesa (or canyon bottom) downward to the 700-ft perched aquifer".

NMED Comment: The sample collected from Regional Well R-25 was collected from the regional aquifer and not the perched intermediate zone. At this point, the HE appears to be present locally in the regional aquifer and it is assumed that contaminant transport pathways extend to the regional aquifer until proven otherwise.

21. Section 6.2.1.1 Scoping, Screening and Problem Formulation, pg. 6-10:

NMED Comment: The text indicates that the ecological risk screening methodology was based upon the EcoRisk Database, version 1.2 (2000). However, EcoRisk has been upgraded to version 1.5 (2002). This newer version was available prior to the date of the RFI report. While it is noted that the report indicates that repeating the methodology with the newer version would not change the outcome, the report should include a discussion of the major differences between versions 1.2 and 1.5 of EcoRisk. It is also not clear whether toxicity reference values from version 1.2 or 1.5 were applied in the risk assessment. LANL shall modify the report to clarify these issues.

22. Section 6.2.2.2 Aquatic Assessment, pg. 6-12:

NMED Comment: This section provides a lengthy discussion on the results of toxicity testing that has been conducted to determine whether the contaminant concentrations in sediments have impacted the benthic macro-invertebrate community. The results of the study have shown a decrease in numbers of species and potential toxicological impacts. In addition, the report implies that these results may be due more to the loss of habitat due to drought conditions than to contaminant loading into the surface water. The last sentence of this section, however, indicates that if there are pockets of sediment causing adverse effects on the aquatic community, the benthic community would most likely avoid these areas. If the stream is in fact being highly impacted by drought, then this would equate to a decrease in area of available habitat. Given these conditions, the benthic community would be more likely to be pushed into areas of unfavorable habitat due to competition. This would result in multiple stresses on the organisms. It appears that under the current drought conditions, the preservation of habitat is critical to the health of the stream community and that even small impacts by site contaminants could be detrimental. LANL shall revise the report to address these issues.

ATTACHMENT 2

General Comments:

1. The terms sediment and soil are used interchangeably throughout the risk assessment. In some cases, the soil, sediment, and tuff are referred to as sediment, but in other instances, sediment refers to sediment associated with surface water bodies. It is suggested that a clear delineation between soil and sediment be maintained throughout the report.

2. Chromium was evaluated in the risk assessment as trivalent chromium. However, the report did not provide a discussion as to whether any differentiation between hexavalent and trivalent chromium was conducted. Assuming that all the chromium is in the form of trivalent chromium is not conservative and most likely underestimates the risk. In natural conditions, chromium is present as a ratio of trivalent to hexavalent chrome of 1:6. Unless analytical evidence, adequate justification, and/or a site-specific chromium ratio is provided demonstrating that all chromium detected at the site is trivalent chromium, then chromium should be evaluated as total chromium, and an appropriate ratio of trivalent to hexavalent chromium be applied. LANL shall revise the report accordingly.

3. The ecological risk assessment should contain a table that clearly indicates what values were applied from the EcoRisk database, each toxicity reference value for each receptor species, and the concentrations used to obtain the hazard quotients for species. Neither Appendix L nor its attachments contain tables delineating this information. LANL shall revise the report accordingly.

Specific Comments for Appendix I-1 (Statistical Analysis of Data for the SWMU 16-021(c)-99 Source Area and Cañon de Valle Alluvial Area):

1. Section 1.0 Introduction, pg. I1-1:

LANL Statement: "This appendix describes the data screening methodology, including statistical tests and analyses, used to evaluate the concentrations of chemicals of potential concern (COPCs) relative to background levels at the solid waste management unit (SWMU) 16-021(c)-99 Source Area and Cañon de Valle alluvial area for the comprehensive analytical data sets (pre- and post-1998 data) evaluated in the baseline risk (Appendix K)".

NMED Statement: LANL used multiple statistical procedures to eliminate COPCs when some results in the data sets exceeded the background value (BV) for the corresponding constituent. The BV were calculated based on the data collected facility-wide, evaluated by statistical procedures, and established as being the upper tolerance limit (UTL) for the background population of each constituent. According to the application of UTL, any exceedance of the UTL is indicative of a release. No further statistical tests are necessary to establish that a particular value does not belong to the background population because the calculation of the UTL itself incorporates this information. LANL shall not use additional statistical tests to

determine COPCs at SWMU 16-021(c)-99 and shall revise the report accordingly.

2. Section 2.0 Identification of COPCs for Human Health Risk Assessments, pg. I1-1:

NMED Comment: The evaluation of the inorganic COPCs in alluvial and surface water (for which no background values are established) performed by geochemical analysis in step 5 is not an EPA-acceptable method for data evaluation, and, in addition, should not be used for eliminating COPCs. LANL shall provide the reference used that states the appropriateness of this type of analysis for data evaluation and COPC determination.

3. Section 4.0 Calculation of COPC Source-term Concentrations, pg. I1-27:

NMED Comment: LANL calculates the upper confidence limit (UCL) for each COPC. However, LANL pools the data for soil and tuff, which were considered separate in the earlier evaluation. Such pooling "dilutes" the data and thus the corresponding UCLs are lower (resulting in lower risk calculations). LANL shall calculate separate UCLs for each COPC in each media.

4. Table I1-7 Statistical Analysis of COPCs in Soil and Tuff at the Source Area and Table I1-8 Statistical Analysis of COPCs in Sediment at the Cañon de Valle Alluvial Area, pgs. I1-30 and I1-31.

NMED Comment: LANL calculates UCLs of the COPCs identified in Tables I1-5 and I1-6. However, all of the identified COPCs from Tables I1-5 and I1-6 do not appear in the UCL tables. LANL shall explain why some (9 constituents for soil and tuff, and 8 constituents for sediments) COPCs were dropped and why UCLs for these COPCs were not calculated.

5. Section 4.2.2 95% UCL Concentration Using Standard Bootstrap Procedure, pg. I1-28:

NMED Comment: LANL states that the *standard bootstrap procedure* is used to calculate UCLs for data that indicated non-parametric distribution, which gives the lowest possible UCL (and thus the calculated risk is decreased). The ProUCL Manual (which LANL uses for this evaluation) describes the Chebyshev's method as the preferred method for calculating non-parametric UCL, and may yield up to a 50 percent higher UCL. LANL shall revise the report accordingly.

6. Section 4.3 95% UCL COPC Concentrations, pg. I1-29:

NMED Comment: LANL explains that, for the log-normally distributed data, the corresponding UCL was calculated using the bootstrap procedure. This approach is not acceptable. There are multiple choices for calculating UCL for log-normally distributed data, and the bootstrap method is not one of them. LANL shall use other methods to determine the UCL. LANL shall revise the report accordingly.

7. Attachment 1, Quantile Test Results for Inorganic COPCs, Tables 5, 6, 7, and 8, pgs.4-6:

NMED Comment: There is inconsistency in the conclusions as to whether the test passed or failed when the table k value was equal to the observed k value. In some cases, the test was indicated as "pass" while in a few others, "fail". LANL shall revise the conclusions for consistency. A conservative approach would be to assume that if the test statistic and the observed statistic are equal, the test would fail.

Specific Comments for Appendix K (Human Health Risk Assessments for Cañon de Valle and Screening Risk Assessments for Martin Spring Canyon):

1. Section 5.1.1 Estimation of Exposure Point Concentrations, pg. K-8, paragraph 2:

NMED Comment: It appears that one site-specific Particulate Emission Factor (PEF) was used in the risk assessment. However, evaluation of construction worker exposures typically considers greater levels of particulate emissions due to heavy equipment traffic on unpaved roads or air emissions resulting from large-scale earth moving activities. Procedures to derive a construction worker PEF are described in USEPA's *Supplemental Guidance for Development Soil Screening Levels for Superfund Sites, Peer Review Draft* (March 2001). LANL shall revise the risk assessment to discuss why use of one PEF value for all exposure scenarios is considered adequate.

2. Section 5.1.4 Source Area, pg. K-9:

LANL Statement: "The COPCs identified in soil and tuff at the source area are assumed to have negligible volatility (LANL 1998, 59891; Appendix D of this document). Therefore, vapor-phase concentrations of COPCs were not evaluated in this risk assessment and the airborne concentration was estimated only for airborne dust".

NMED Comment: The text should be clarified to indicate that the use of a volatilization factor only applies to volatile organics and that the few organic compounds that were retained as COPCs are not volatile organics and, therefore, the use of a volatilization factor would not apply to the COPCs.

3. Section 5.2 Quantification of Chemical Intake, pg. K-10:

NMED Comment: The discussions of how the overall chronic daily intake (CDI) is estimated, as well as the CDI for the site soil, sediment, surface water, and dermal contact, refer to several input parameters such as the contact rate, exposure frequency, exposure duration, inhalation and ingestion rates, skin adherence factors, fractions ingested/inhaled, and skin surface areas. However, the text does not define what values were used for these input parameters nor does the text reference where these input values are defined. LANL shall revise the text to include a reference to Table K-7 where these parameter values are defined.

4. Section 5.2.3 Dermal Contact with Soil, Sediment, and Surface Water, pg. K-11:

NMED Comment: The methodology outlined to assess dermal contact with surface water is appropriate only for inorganic constituents. Newer methods have been developed to evaluate the dermal risks associated with organic constituents in water. These methods are detailed in EPA's *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment* (EPA/540/R/99/005, September 2001). LANL shall revise the report to use the latest dermal risk assessment guidance methodology.

5. Section 7.2 Noncancer Hazard Characterization Methods, pg. K-15:

NMED Comment: While it is conservative to sum all chemical-specific Hazard Quotients (HQs) to derive a pathway specific Hazard Index (HI) and multi-pathway Total HI, this methodology is not strictly accurate. The HI is more appropriately the sum of all HQs that have the same critical effect or affect the same target organ. LANL shall revise the risk assessment text to state that as a first conservative estimate of the Total HI, all chemical HQs in all pathways will be assumed to be additive. Then, if the Total HI using this methodology exceeds the target HI of 1.0, a more accurate target-organ/critical effect HI will be calculated.

6. Section 7.3.3 Construction Worker, pg. K-17:

Since the Total HI for the construction worker exceeds 1.0 when the conservative assumption of additivity of all chemical HQs is used, a refined analysis should be conducted for this scenario with separate HIs calculated to reflect target-organ/critical effects. For example, the major risk drivers have the following target organ or critical effects: TNT (liver), RDX (prostate), and barium (kidney). LANL shall revise the report to calculate a more accurate HI for the construction worker scenario. (See Specific Comment #7).

7. Table K-1 Comparison of Chemical Concentrations versus SALs SWMU 16-021(c)-99 Source Area, pg. K-24:

NMED Comment: There is general agreement with the values used for the SALs, with the exception of trichlorofluoromethane. The SAL is listed as 12,000 mg/kg, which appears to be quite elevated. The revised New Mexico Soil Screening Guidance (NMSSG) (currently under peer review), the Region 9 PRGs, and the Region 6 PRGs provide a SAL for residential soil in the 300 to 500 mg/kg range. LANL shall review the calculations for the derivation of the SAL for trichlorofluoromethane and revise the table and assessments accordingly. It is noted that the site maximum concentration would still be below 10% of the most conservative SAL listed above.

8. Table K-3 Comparison of Chemical Concentrations versus SALs for Sediment at the Cañon de Valle, SWMU 16-021(c)-99, pg. K-33:

NMED Comment: There is general agreement with the values used for the SALs, with the exception of hexachlorobenzene (3 mg/kg), indeno(1,2,3-cd)pyrene (6.2 mg/kg), and trichlorofluoromethane (12,000 mg/kg). For hexachlorobenzene and indeno(1,2,3-cd)pyrene, the revised NMSSG, the Region 9 PRGs, and the Region 6 PRGs provide SALs for residential soil of 0.3 mg/kg and 0.62 mg/kg, respectively. In addition, the SAL for trichlorofluoromethane is in the 300 to 500 mg/kg range. LANL shall review the calculations for the derivations of the SALs for hexachlorobenzene, indeno(1,2,3-cd)pyrene, and trichlorofluoromethane and revise the table and assessments accordingly. It is noted that the site maximum concentrations would still be below 10% of the chemical's respective SALs listed above.

9. Table K-7 Exposure Factors Used to Estimate Intake of COPCs at the SWMU 16-021(c)-99, pg. K-44:

NMED Comment: In reviewing the table of exposure factors, it appears that most of the data were taken from US EPA 1997 and 1991. According to the reference list provided in Appendix K, the 1997 reference is for the "Health Effects Assessment Summary Tables" and the 1991 reference is the "Role of the Baseline Risk Assessment in Superfund Remedy Selections Decisions". It appears that either the references on the table were mislabeled or the references were not included in the reference list. However, the values in the table were reviewed against the recommended input parameters outlined in USEPA's *Supplemental Guidance for Development Soil Screening Levels for Superfund Sites, Peer Review Draft* (March 2001) and USEPA's *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment* (EPA/540/R/99/005, September 2001). An assumption was made that the environmental worker closely resembled that industrial worker as defined in the above referenced document. The following modifications to the input parameters listed in Table K-7 shall be made as noted below.

Environmental Worker (RME)	Construction Worker (RME)
EF – 225 days/year	IRinh – 0.83m^3/hour (20 m^3/day)
ED – 25 years	IRing -- 330 mg/day (RME and CME)
AT (noncarcinogens) – 25 years	Soil-to-Skin AF – 0.3mg/cm^2 (RME and CME)
IRinh – 0.83m^3/hour (20 m^3/day)	SA – 3300 cm^2
SA – 3300 cm^2	

10. Table K-8 Toxicity Factors for COPCs in the SWMU 16-021(c)-99, pg. K-45:

NMED Comment: Several discrepancies were noted as follows:

- The dermal absorption factors (ABSd) are all referenced to New Mexico's SSG. This guidance has undergone subsequent updates. In general, all inorganics should have an ABSd of zero. LANL shall revise the ABSd values accordingly. It is recommended that the Region 9 PRG tables be used as a reference.

- An oral reference dose (RfDo) is listed for benzo(a)pyrene, however, the Integrated Risk Information System (IRIS) does not provide an RfDo. LANL shall clarify the reference and value.

- An RfDo for 1,2-dichloroethane is available from National Center for Environmental Assessment (NCEA) (3.0E-2 mg/kg/day).

- It is unclear whether the mercury is elemental mercury or methyl mercury. The value for the RfDo is listed as 3.0E-4 mg/kg/day; however, this is the value listed in Health Effects Assessment Summary Tables (HEAST) and not IRIS. The RfDo for mercury in IRIS is based on methyl mercury and is 1.0E-4 mg/kg/day. LANL shall clarify the speciation of mercury and clarify the toxicity datum and reference.

11. Attachment 1, Section 2.0 Data Evaluation and Identification of COPCs (Comparison to Surface Water Screening Levels), pg. 2.

NMED Comment: As noted previously (see Specific Comment #5 in Attachment 1), NMWQCC standards and MCLs are not solely risk-based numbers, but also incorporate technology limitations, and as such comparison of site data to these numbers will not provide an indication of whether there is acceptable risk. The use of these values may be helpful as a tool if no risk-based screening numbers are available or for assessing remediation alternatives, but should not be used to select COPCs. LANL shall revise this attachment to select Martin Spring Canyon COPCs for water based upon comparison to the residential tap water screening levels (either Region 6 or Region 9). If there are no tap water screening levels available, and toxicological data are not available to support the derivation of the tap water screening values, then the NMWQCC and/or MCL may be appropriate for use.

12. Attachment 1, Section 4.0 Comparison of Results, pg. 2.

NMED Comment: The report indicates that risks were only estimated for those chemicals in Martin Spring Canyon that were elevated above those retained for the Cañon de Valle risk assessment. The theory is that if the concentrations were less than those at Cañon de Valle, the risks due to exposure to contaminants in Martin Spring Canyon would be less. This rationale is adequate; however, the discussion of the results is complicated by the fact that some constituents have higher concentrations in Martin Spring Canyon than at Cañon de Valle. LANL shall provide a table summarizing the input parameters and results for the risks calculated and associated with Martin Spring Canyon. The text shall also quantify the total risk to the receptors in Martin Spring Canyon, and not just qualitatively discuss the comparative magnitude of risk. LANL shall revise the report to clearly demonstrate that cumulative risks at Martin Spring Canyon are within acceptable ranges.

<u>Specific Comments for Appendix L (Ecological Risk Assessment for Cañon de Valle):</u>

1. Section 2.1 Overview, pg. L-4, paragraph 1:

NMED Comment: This section indicates that the present-day contamination concentrations and inventories are expected to be the worst-case. However, Section 5.2 of the report states that there has been significant contaminant transport downstream of Cañon de Valle. These two statements appear to contradict each other. LANL shall clarify what data and concentrations will be used to represent the worst-case scenario.

2. Section 2.2 Habitat Description and Exposure Pathways, pg. L-6, paragraph 3:.

LANL Statement: "Food web transfers and direct soil ingestion are considered minor pathways because the contaminated soils in the canyon occupy a small area of the canyon floor."

NMED Comment: While the results of a risk assessment may show direct soil ingestion to be a minor pathway, the baseline risk assessment must include all complete exposure pathways. The direct ingestion of soil is a complete pathway, and as such must be addressed in the risk analysis. LANL shall revise the risk assessment to include direct ingestion of soil.

3. Section 4.1 Terrestrial System, pg. L-8:

NMED Comment: Several constituents were not included in the screening assessment, as the EcoRisk version 1.2 did not contain toxicological criteria for the respective constituents. Risk assessments rarely rely on only one source for toxicological criteria. While it is noted that avian and invertebrate toxicity data may, in fact, not be available, other sources and studies for avian toxicological criteria should be reviewed to determine whether toxicity data is available. LANL shall revise accordingly.

4. Section 6.2.2 Toxicity Test, pg. L-17:

LANL Statement: "The midge, *Chironomus tentans* is a toxicity test organism that is well documented for its toxic responses to contaminants, is widely used in toxicity testing, and is reared from laboratory populations".

NMED Comment: While the use of the midge as a test species is acceptable, LANL shall discuss the sensitivity of the midge compared to the *Ceriodaphnia dubia*, which is often used by toxicological laboratories to test sensitivity to metals in water.

5. Table L-8 TRVs for Top Carnivore Receptors and ESLs for Mexican Spotted Owl Associated with Cañon de Valle COPECs, pg. L-23:

NMED Comment: The footnote of the table defines the dose as the TRV multiplied by 0.6 kg (owl body weight). Typically the screening level exposure dose incorporates the exposure point concentration, ingestion rate, an area use factor and body weight. LANL shall clarify how the dose was determined.

6. Attachment 1, Section 4.4, Radionuclides, pg. 9:

NMED Comment: The text indicates that the only radionuclide that exceeded background concentrations was cesium. However, this is inconsistent with the human health risk assessment conducted for the trail user. Under this scenario, rubidium also exceeded background concentrations and was carried forward in the analysis. LANL shall discuss rubidium concentrations and justify the exclusion of this radionuclide from the discussion.