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March 14, 2006

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505-6303



Reference: Work Assignment No. 06110.270; State of New Mexico Environment Department, Santa Fe, New Mexico; Support for the LANL Order of Consent; Review of the Investigation Report for Material Disposal Area U, Consolidated Unit 21-017(a)-99 at Technical Area 21, Los Alamos National Laboratory, New Mexico, Task 3 Deliverable.

Dear Mr. Cobrain:

Attached please find a deliverable for the above-referenced work assignment. The deliverable addresses the review of the risk assessment for the "Investigation Report for Material Disposal Area U, Consolidated Unit 21-017(a)-99 at Technical Area 21," Los Alamos National Laboratory, New Mexico (herein referred to as the Investigation Report).

This deliverable was emailed to you on March 14, 2006 at David.Cobrain@state.nm.us to Ms. Kathryn Chamberlain at Kathryn.Chamberlain@state.nm.us. A formalized hard (paper) copy of this letter deliverable will be sent via mail. If you have any questions, please call me at (303) 763-7188 or Ms. Paige Walton at (801) 451-2978.

Sincerely,

June K. Dreith
Program Manager

Enclosure

cc: Kathryn Chamberlain, NMED
Ms. Paige Walton, TechLaw

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TASK 3 DELIVERABLE

**REVIEW OF THE RISK ASSESSMENT FOR
INVESTIGATION REPORT FOR MATERIAL DISPOSAL AREA U, CONSOLIDATED
UNIT 21-017(A)-99 AT TECHNICAL AREA 21**

Support for the LANL Order of Consent

Submitted by:

**TechLaw, Inc.
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Submitted to:

**Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505**

In response to:

Work Assignment No. 06110.270

March 14, 2006

**REVIEW OF THE RISK ASSESSMENT FOR
INVESTIGATION REPORT FOR MATERIAL DISPOSAL AREA U, CONSOLIDATED
UNIT 21-017(A)-99 AT TECHNICAL AREA 21**

GENERAL COMMENTS

1. The results of the risk assessment indicate that this site only meets the risk-based criteria for a non-intrusive industrial worker. As such, the report should clearly indicate that the site does not meet the criteria for No Further Action (unrestricted use), as residential risk levels could not be met. In addition, the report should clearly indicate in the conclusions portion of the document that both current and future use of the site will be limited to non-intrusive industrial use and that if at any time in the future land uses changes (e.g., construction of a building or excavation or regarding of an area), then additional risk analysis will be conducted. The report also indicates that volatile organic compounds (VOCs) are present in subsurface soil. The soil screening levels for an industrial worker do not include an evaluation of VOC buildup in indoor air. As an analysis of the risks associated with the inhalation of VOCs volatilized into indoor air was not conducted, the land use at the site must also be limited to outdoor exposure only (i.e., no indoor workers are allowed). Please revise the report accordingly.
2. In reviewing the tables summarizing the hazard quotients (HQs) for the human health risk assessment, it is noted that a HQ was calculated for lead and that this HQ was incorporated into the hazard index (HI). This is not technically correct. Lead is evaluated relating soil lead intake to blood level concentrations. As such, lead should be evaluated individually and a HQ should not be calculated for this constituent. Please revise the risk table to remove the calculation of a HQ for lead and revise all subsequent HIs.

SPECIFIC COMMENTS

1. **Appendix B, Table B-2.2-1, Frequency of Radionuclides Detected above BVs/FVs or Detected at MDA U.** For several of the radionuclides, the table indicates that background data were not available. This was identified for Am-241, Cs-137, Pu-238, Pu-239, Sr-90, and H-3 for the media “Qbt 2,3,4”, “Qbt 1v”, and “Qbt 1g/Qct/Qbo”. However, in reviewing the referenced 1998 LANL background document, in particular Table 6.0-2, a background value for these media for the above-listed radionuclides was provided. It is noted that the Table 6.0-2 indicates that the values provided are based upon nominal detected activity. While it is a conservative assessment to not account for any concentration in background, it is not clear why the background values were not applied. Please clarify whether the background values for radionuclides that were based upon nominal detectable activity were not applied as a measure of conservatism, or provide additional rationale for why these data were not used.
2. **Appendix H, Section H-2.2, Sampling Results and Determination of Chemicals of Potential Concern, page H-2.** The last paragraph states that “No radionuclides were retained as COPECs” [constituents of potential ecological concern]. However, several

radiological constituents were identified in the 0-1 foot soil interval for the industrial scenario. As the ecological soil interval applied in the assessment was 0-5 feet below ground surface, it is not clear why the text indicates that radionuclides identified in the 0-1 foot interval were dropped from the analysis. Further, in reviewing the tables associated with the ecological risk, it appears that radionuclides were included. Thus, there appears to be a discrepancy between the text and the ecological risk assessment.

3. **Appendix H, Section H-3.0, Conceptual Site Model, page H-3.** The second paragraph indicates that migration of contaminants to groundwater through the vadose zone is unlikely given the distance to groundwater. However, distance to groundwater is not the only factor that must be considered when evaluating fate and transport of contaminants in the vadose zone. Other factors such as chemical concentration, chemical mobility, porosity, infiltration rates, and etc. must also be considered. As such, sufficient justification that contaminants could not migrate to groundwater has not been provided. The risk assessment should include an evaluation of the associated concentrations against soil screening levels (SSLs) for migration to groundwater based upon a dilution attenuation factor (DAF) of 20. Please revise the assessment to include an analysis against these SSLs (DAF 20).
4. **Appendix H, Table H-4.3-3, Representative Concentrations for Ecological Risk.** Aluminum is listed on this table as a constituent for the ecological risk assessment. However, in reviewing the tables with the ecological toxicity reference values and associated hazard quotient calculations, aluminum is not included. It is assumed that aluminum was eliminated from the ecological analysis due to the fact that the pH of soil at MDA U. As stated in the United States Environmental Protection Agency's (USEPA) Ecological Soil Screening Level Workgroup (July 10, 2000), "Potential ecological risks associated with aluminum in soils are identified based on the measured soil pH. Aluminum is identified as a chemical of concern only for those soils with a soil pH of less than 5.5." However, it does not appear that the text (Appendix H) discusses the rationale for eliminating aluminum from the assessment. Please clarify the soil pH at MDA U and discuss why aluminum was eliminated from the ecological assessment.
5. **Appendix H, Section H-5.1.2.3, Toxicity Assessment, page H-7.** The report indicates that no screening action levels (SALs) exist for radium-223, radon-219, and thorium-227. However, in reviewing the Environmental Protection Agency's (EPA) Preliminary Remediation Goal (PRG) calculator for radionuclides (http://epa-prgs.ornl.gov/radionuclides/prg_search.shtml), PRGs were available for these isotopes. Using the outdoor worker scenario, a conservative assumption, and default input values, the following PRGs were obtained:
 - Radium-223: 27 pCi/g,
 - Radon-219: 1.34E8 pCi/g, and
 - Thorium-227: 194 pCi/g.

The maximum detected values for radium-223 (3.82 pCi/g), radon-219 (1.8 pCi/g), and thorium-227 (4.41 pCi/g) are well below the EPA PRGs, and therefore, there is no concern that excluding these isotopes affects the results of the risk assessment. However, the report

should be modified to clarify that while LANL may not have developed SALs for these radioisotopes, other screening levels, such as the EPA PRGs, exist and that these PRGs should have been used in the assessment. Please modify the text accordingly.