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November 13, 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. 06280.100; State of New Mexico Environment Department, Santa Fe, New Mexico; LANL Risk Assessment Support; Review of Investigation Report for Material Disposal Area T, Task 2 Deliverable.

Dear Mr. Cobrain:

This letter addresses the above-referenced work assignment and provides risk assessment review comments on Appendices I and J of the Investigation Report for Material Disposal Area T (MDA T) at Los Alamos National Laboratory (LANL), dated September 2006.

Appendix I of the report was evaluated with respect to background reference values and fall out values for the inorganics and radionuclides. The document "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments and Bandelier Tuff at Los Alamos National Laboratory" dated September 1998 was used in reviewing these data. Unless noted in the attached deliverable (refer to comment related to Uranium-234), all background data and fallout values were consistent with this background document.

Table I-2.0-1 is referenced in the text as summarizing all of the constituents of potential concern (COPCs) for all chemicals and radionuclides identified in each medium. This table is important to summarize the site attribution analysis and selection of COPCs that are carried forward in the risk assessment. Please note that while Table I-2.0-1 is not listed in the table of contents for Appendix I, the table is provided out of order in Appendix I; its location is after Table I-3.1-4 (beginning on page I-124).

The 95% upper confidence level of the mean (UCL) was used as the exposure point concentration (EPCs) in the risk assessment, where the UCLs were calculated using the United States Environmental Protection Agency's model ProUCL. Consistent with guidance for calculating EPCs, if a UCL could not be estimated or was deemed inappropriate, the site maximum detection concentration was used as the EPC. No comments were drafted concerning EPCs.

The risk assessment included a residential screening assessment for informational purposes only. The identified current and future land use at the site is non-intrusive industrial use. Construction activities were only assessed for the area around building 21-257. The results of the construction assessment resulted in noncarcinogenic risks slightly above the New Mexico target level of 1.0 and a radiological dose significantly above (over 25 times) the dose limit of 15 millirem per year (mrem/yr). In addition, the residential dose was several hundred times the dose limit which indicates that controls should be in place to track the land use and ensure that land is used only for non-intrusive industrial use. In the event that land use changes, for example to construction and/or residential use, additional characterization, remediation, and risk assessment would be required.

Similarly, for the DP Canyon, the risk assessment addresses a residential and recreational receptor, and these receptors were identified for informational purposes only. Results of the residential screening assessment for DP Canyon indicated hazards slightly above the New Mexico target hazard index of 1.0. Carcinogenic risks for the resident were below the New Mexico target cancer risk of  $1E-05$ . However, for the recreational receptor, both noncarcinogenic hazards and carcinogenic risks were below the New Mexico target levels and the total dose for a recreational person was less than the dose limit of 15 mrem/yr. Therefore, land use for the area assessed in this report in DP Canyon should be restricted to recreational use only. As industrial risks were not evaluated, restrictions preventing development of this area should also be in place.

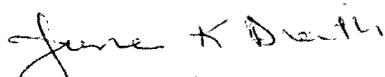
Groundwater was not evaluated in the risk assessment. The rationale for concluding that migration of contaminants in site soil to groundwater was not likely to occur, were (1) the depth to groundwater (1300 feet), (2) low gravimetric water content, and (3) lack of hydrostatic pressure. Similar to other sites evaluated at LANL, groundwater likely has not been impacted by site soils. However, it is suggested that borehole data be reviewed to confirm whether there is a trend of decreasing concentration with depth to ensure that the vertical extent of contamination has been adequately identified.

MDA T was evaluated as a consolidated unit with the areas to the southwest of North Perimeter Road being addressed as one consolidated unit and DP Canyon as a separate unit. Given the small size of the site, historically similar waste activities, and consistent land use scenario, the consolidation of MDA T into one unit appears adequate. It is agreed that DP Canyon, which was evaluated individually, was appropriate.

There were few technical issues noted with the human health and ecological risk assessments. The assessments were conducted consistent with approved methodologies. A spot check of ecological toxicity equivalency factors was conducted against LANL's EcoRisk database (version 2.2). No discrepancies were noted.

This letter deliverable was emailed to you on November 13, 2006 at David.Cobrain@state.nm.us to Mr. Mark Cummings at Mark.Cummings@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) 464-6525 or Ms. Paige Walton at (801) 451-2978.

Sincerely,

A handwritten signature in cursive script that reads "June K. Dreith".

June K. Dreith  
Program Manager

Enclosure

cc: Mark Cummings, NMED  
Ms. Paige Walton, TechLaw  
TechLaw Files

**TASK 2 DELIVERABLE**

**RISK ASSESSMENT REVIEW OF THE  
INVESTIGATION REPORT MATERIAL DISPOSAL AREA T  
LOS ALAMOS NATIONAL LABORATORY  
SEPTEMBER 2006**

**LANL Risk Assessment Support**

**Submitted by:**

**TechLaw, Inc.  
3920 W. 98<sup>th</sup> Place  
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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. 06280.100.0002**

**November 13, 2006**

**RISK ASSESSMENT REVIEW OF THE  
INVESTIGATION REPORT MATERIAL DISPOSAL AREA T  
LOS ALAMOS NATIONAL LABORATORY  
SEPTEMBER 2006**

**TECHNICAL REVIEW COMMENTS**

1. A residential risk assessment is included in the report for “informational purposes only.” However, the perceived intent of the residential analysis is to determine whether land use controls, limiting the site to industrial use only, are necessary. It is suggested that in lieu of using the phrasing “for informational purposes only,” the report indicate that the residential analysis is include to established whether land use controls and use restrictions are warranted.
2. Appendix J, Section J-2.1, Current Sampling Data, page J-3. At the end of the first paragraph, the text indicates that current and historical data of acceptable quality were used in the human and ecological risk evaluation. However, it is unclear if the current data followed the same data quality assessment as was presented in Appendix B for the historical data discussion (Section J-2.2). Please clarify whether the data quality evaluation for both current and historical was consistent between the two data sets for use in the risk assessments.
3. Appendix J, Section J-3.3, Human Health Receptors and Pathways, page J-7. The last paragraph of this section indicates that the exposure pathways for pore gas data are incomplete. An evaluation of pore gas data with respect to the potential for migration to groundwater was provided in the assessment, however, justification for exclusion of the evaluation of the vapor intrusion pathway was not provided. In reviewing the pore gas data, several volatile organic compounds (VOCs) were detected. It is possible to model pore gas data and evaluate the vapor intrusion pathway for the migration of VOCs from pore gas into buildings. Under an industrial scenario, the vapor migration into indoor air pathway should be identified as a complete exposure route and evaluated using a vapor intrusion model, such as the Johnson and Ettinger model. Please provide additional lines of evidence for determining that the pore gas data are not applicable to the risk assessment as a source for indirect exposure via inhalation, otherwise the data should be used in a quantitative evaluation of this pathway.
4. Appendix J, Table J-4.1-2, Consolidated Unit 21-016(a)-00, Carcinogenic Screening Evaluation, page J-55. It is noted that for arsenic and bis(2-ethylhexyl)phthalate, a carcinogenic soil screening level (SSL) was not applied for the construction worker. The footnote indicates that the exclusion of the carcinogenic SSL was based on the New Mexico SSL guidance not listing a carcinogenic SSL. However, the SSL guidance lists the SSL based on whether carcinogenic risk or noncarcinogenic hazard drives the SSL level. The basis of an SSL on a non-carcinogenic hazard does not imply that carcinogenic risks are not present. Thus, for adequately assessing the carcinogenic pathway for the construction worker, a carcinogenic based SSL should have been estimated. However, given the results of the construction worker scenario indicate that overall hazard and dose are above the target

levels, and site activities for a construction worker will be restricted, the exclusion of carcinogenic risks for arsenic and bis(2-ethylhexyl)phthalate for the construction worker do not impact the overall conclusions of the assessment. In addition, the exclusion of these constituents was addressed in the uncertainties section of the report. Therefore, no modifications are warranted at this time.

5. Appendix J, Table J-4.1-4, Consolidated Unit 21-016(a)-99 Toxicity Equivalency for Dioxin, page J-58. It is noted that the toxicity equivalency factors (TEF) applied were based upon the World Health Organization's (WHO) 1998 data. Please note that WHO has recently re-evaluated the dioxin/furan TEFs and have recently released revised TEFs (*The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds* ToxSci Advance Access published July 7, 2006). While there are differences between the 1998 and the 2005 TEFs, the use of the more recent TEFs does not result in a significant difference in overall risks for dioxins/furans and actually is reflective of a slightly lower risk (revised risk  $3.78\text{E-}07$  versus LANL calculated risk  $3.97\text{E-}07$ ). Please note these updated TEFs for future assessments, however, at this time, no revision is warranted.
6. Appendix I, Table I-3.3-1, Frequencies of Radionuclides Detected in Soil and Fill above Background/Fallout Values, page I-190. It is noted that the background reference value listed on the table for Uranium-234 (U-234) for the paleochannel samples (Qal), is 2.89 picoCuries per gram (pCi/g). However, "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments and Bandelier Tuff at Los Alamos National Laboratory" dated September 1998, lists the background value for canyon sediment for U-234 as 2.59 pCi/g. While there is a slight discrepancy noted between the background values, the overall impact of these data is insignificant, as U-234 is carried forward as a constituent of potential concern (COPC) for the quaternary alluvium. Therefore, no modification to the report is required at this time.