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January 9, 2007

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 Appendix I of the Investigation Report for Material Disposal Area A at Technical Area 21, Task 2 Deliverable.

Dear Mr. Cobrain:

This deliverable addresses the above-referenced work assignment and provides risk assessment review comments on Appendice I of the Investigation Report for Material Disposal Area A (MDA A) at Technical Area 21 at Los Alamos National Laboratory (LANL), dated November 2006.

Appendix I of the report was evaluated with respect to background reference values and fallout values for the inorganics and radionuclides. The ecological risk assessment clearly presents the use of background levels in identifying contaminants of potential ecological concern (COPECs), however, the human risk screening is unclear regarding how background levels were used. It is agreed, though, that based on a review of other sections of the report that a number of inorganics and radionuclides are likely to be representative of background or fallout values. In future documents, removal of specific inorganics or radionuclides as human health chemicals of potential concern (COPCs) due to background should be clearly substantiated by referencing relevant tables and appendices (i.e., Appendix H) throughout the human health screen.

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 (USEPA) model ProUCL. Consistent with guidance for calculating EPCs, if a UCL could not be estimated or was deemed inappropriate, the site maximum detected value (MDV) was used as the EPC for the human risk assessment. No comments were drafted concerning EPCs. However, in the ecological risk assessment there were some cases where the UCL was estimated to be greater than the MDV, yet the UCL was still applied. Standard risk assessment protocol for developing EPCs indicates that if a UCL is greater than the maximum detected concentration, then the EPC should default to the MDV. As a

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result, for some compounds, the ecological risk assessment overestimated risk when the UCL was used instead of the MDV. A comment has been drafted concerning this issue.

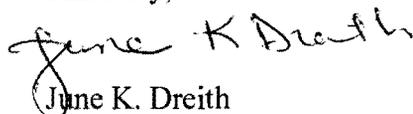
Although the MDA A is located within an industrial area under Laboratory (institutional) control, the property may be transferred to the public and thus, the unit was appropriately evaluated under a future residential land use exposure scenario. The results of the human health risk screening assessment conclude that noncarcinogenic risks are below the New Mexico target level of 1.0. However, the incremental excess cancer risks exceed the NMED target cancer risk level of  $1 \times 10^{-5}$  for future residential exposure due to tetrachlorodibenzodioxin [2,3,7,8-] when background conditions are considered. Therefore, land use for the area assessed in this report supports the need for restrictions. A comment has been drafted concerning this issue.

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 include: (1) the depth to groundwater (1265 feet), (2) horizontal and vertical migration of contamination is limited by the low moisture content of the subsurface, and (3) lack of hydrostatic pressure. Although groundwater likely has not been impacted by site soils, 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. Much of this information is available in Appendix H of the document and should be referenced in the risk assessment, Appendix I, to address this concern. In addition, this information further supports that the soil-to-groundwater migration pathway is not of concern.

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 residential screening levels and ecological toxicity equivalency factors was conducted against LANL's EcoRisk database (version 2.2) and no discrepancies were noted.

This letter deliverable was emailed to you on January 9, 2007 at David.Cobrain@state.nm.us to Ms. Darlene Goering at darlene.goering@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. Claire Marcussen at (352) 332-0669.

Sincerely,



June K. Dreith  
Program Manager

Enclosure

cc: Ms. Darlene Goering, NMED  
Ms. Claire Marcussen, TechLaw  
TechLaw Files

**TASK 2 DELIVERABLE**

**RISK ASSESSMENT REVIEW OF APPENDIX I OF THE  
INVESTIGATION REPORT MATERIAL DISPOSAL AREA A  
AT TECHNICAL AREA 21  
LOS ALAMOS NATIONAL LABORATORY  
NOVEMBER 2006**

**LANL Risk Assessment Support**

**Submitted by:**

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**Submitted to:**

**Mr. David Cobrain  
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Building One  
Santa Fe, New Mexico 87505**

**In response to:**

**Work Assignment No. 06280.100.0002**

**January 9, 2007**

**RISK ASSESSMENT REVIEW OF APPENDIX I OF THE  
INVESTIGATION REPORT MATERIAL DISPOSAL AREA A  
AT TECHNICAL AREA 21  
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**TECHNICAL REVIEW COMMENTS**

1. **Investigation Report, Section 5.2, Screening Levels and Cleanup Goals, page 27**—This section indicates that the industrial, construction worker, and recreational scenarios were evaluated in the risk assessment (Appendix I), however, the residential scenario is not mentioned in the Investigation Report, section 5.2. This section should include the residential scenario to be consistent with the risk assessment presented in Appendix I.
2. **Investigation Report, Section 7.3.1, Human Health Risk Screening, page 34**—This section does not include the summary of risks associated with the residential scenario although this scenario was evaluated in the human risk assessment (Appendix I). It is understood that the residential scenario is not a decision scenario for the determination of further investigation or corrective action, however, this scenario is evaluated to determine the need for landuse restrictions. In addition, a conclusion statement is made that states there is no potential for unacceptable dose or risk to human health for the decision scenarios and a recommendation for further investigation or corrective action is not warranted. This statement needs to be expanded to also conclude that because the residential scenario exceeds the NMED target risk level of  $10^{-5}$  (NMED 2006, 92513) due to the presence of tetrachlorodibenzodioxin [2,3,7,8-], landuse restrictions are required for the site. This section should include the residential scenario to accurately reflect the results of the risk assessment presented in Appendix I and to justify the need for land use restrictions.
3. **Appendix I, Section I-5.4.7, COPECs Contributing to PAUF-Adjusted HIs Greater Than 1, page I-22**-The second paragraph indicates that the ecological screening assessment utilized the 95% upper confidence level of the mean (UCL95) even if the UCL95 was higher than the maximum concentration. Standard risk assessment practice (USEPA, 2002) is to use the lower of the UCL95 or maximum concentration, if adequate samples have been collected to estimate a population mean. The approach taken was more conservative, however, in future risk assessments, use of the maximum should be used if the UCL95 is predicted to be higher than the maximum when adequate samples are collected to estimate a population mean.

USEPA. 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Solid Waste and Emergency Response, OSWER 9285.6-10. December 2002.

4. **Appendix I, Section I-3.2, Current and Reasonably Foreseeable Future Land Use, page I-6**--The fourth paragraph of this section indicates that the residential scenario is evaluated for informational purposes only without providing a clear description on what purpose this

information serves. Similar statements are made throughout Appendix I. The reason a residential scenario is included as a future land use is to determine the need for landuse controls (LUCs) or other type of institutional control (ICs), in the event landuse were to ever change from current uses. Please remove reference to “informational purposes only” in this section and throughout the report and replace with a rationale as to why the residential scenario must be evaluated.

5. **Appendix I, Section I-3.3, Human Health Receptors and Exposure Pathways, Page I-7--**

The last paragraph of this section indicates that exposure pathways for pore gas are incomplete without an explanation to justify this conclusion. According to Table I-3.5-2, Results of Pore Gas Screening Based on Maximum Detected Concentrations, a number of VOCs were detected in pore gas, which would suggest that vapor intrusion from the subsurface into a future building could be a potentially complete exposure pathway. USEPA’s *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Soil Vapor Intrusion Guidance)* EPA 530-F-02-052, Office of Solid Waste and Emergency Response, Washington, D. C. provides default shallow soil gas [5 feet or less below ground surface (bgs)] and deep soil gas (greater than 5 feet bgs) screening levels that are protective of indoor air; the screening values for a  $1 \times 10^{-5}$  risk and a hazard index (HI) of 1.0 should be used. In addition, this guidance references the use of a spreadsheet model, such as the Johnson and Ettinger model that can also be used. 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 screening evaluation of this pathway.

6. **Appendix I, Section I-3.5, Environmental Fate and Transport of COPCs, page I-8--**

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 (1265 feet), (2) Horizontal and vertical migration of contamination is limited by the low moisture content of the subsurface, and (3) lack of hydrostatic pressure. Although groundwater likely has not been impacted by site soils, 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. Much of this information is available in Appendix H of the document and should be referenced in the risk assessment, Appendix I, to address this concern. In addition, this information further supports that the soil-to-groundwater migration pathway is not of concern.

7. **Appendix I, Section I-4.3, Interpretation, page I-17--**

The second paragraph in this section indicates that the total estimated excess cancer risk for the residential landuse is approximately  $3 \times 10^{-5}$  which is above the NMED target level of  $10^{-5}$  due to the presence of tetrachlorodibenzodioxin [2,3,7,8-]. The exceedance of the NMED target level justifies the need for land use or institutional controls in the event that the site were to change from the current industrial land use. This section should remove the statement that the residential risks are presented for informational purposes only and clarify that the residential risks are presented to justify the need for LUCs/ICs.

8. **Appendix I, Section I-6.1, Human Health, page I-24 and I-25**--This section summarizes the results of the human health screening risk assessment and states that the total estimated excess cancer risks were below the NMED target level of  $10^{-5}$  (NMED 2006, 92513) for industrial and construction worker exposures at MDA A and for recreational exposure on the DP Canyon slope. However, this section does not include the results from the future residential risk evaluation which were above the NMED target level of  $10^{-5}$  due to tetrachlorodibenzodioxin [2,3,7,8-]. As stated in the previous comment, the exceedance of the NMED target level for future residential exposure justifies the need for landuse or institutional controls in the event that the site is no longer under Laboratory control. Please include a brief discussion on the results of the residential risk results which support the need for landuse restrictions for this area.
  
9. **Appendix I, Figure I-3.0-1, Human Health Conceptual Site Model, page I-29**--The soil pore gas data indicate detections of a number of volatile organic compounds (VOCs); however, the conceptual site model does not address the presence of vapors in the subsurface as a potential source contributing to the vapor intrusion exposure pathway. Please revise the figure to include inhalation exposure from subsurface vapors and revise the text to include rationale for including/excluding this pathway from further analyses.