TA-16

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RETURN RECEIPT REQUESTED

April 12, 2004

Mr. David Gregory, Federal Project Director
Los Alamos Site Operations
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, New Mexico 87544

Mr. G. Pete Nanos, Director

Los Alamos National Laboratory
P.O. Box 1663, Mail Stop A100
Los Alamos, New Mexico 87545

SUBJECT: REQUEST FOR SUPPLEMENTAL INFORMATION FOR MATERIAL DISPOSAL AREA P SITE CLOSURE CERTIFICTION REPORT LOS ALAMOS NATIONAL LABORATORY EPA ID No: NM0890010515 HWB-LANL-03-019

Dear Messrs. Gregory and Nanos:

The New Mexico Environment Department (NMED) has received the United States Department of Energy and Regents of the University of California (the Permittees) report entitled "Material Disposal Area P Site Closure Certification Report" dated October 2003 (referenced by LA-UR-03-8046 and ER2003-0643). NMED has reviewed the document and is requesting supplemental information. The comments are provided as an attachment to this letter. The Permittees must respond to the comments within thirty days of receipt of this letter.

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If you have any questions, please contact Neelam Dhawan at (505) 428-2540.

Sincerely,

John Young
LANL Corrective Action Project Leader
Permits Management Program

JRY:nmd

Attachment

cc: S. Martin, NMED HWB
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File: Reading and LANL/TA 16

ATTACHMENT
COMMENTS ON THE MATERIAL DISPOSAL AREA P SITE, CLOSURE CERTIFICATION REPORT, OCTOBER 2003

General Comments

1. The risk assessment evaluates two areas: the biological zone and the exposed tuff area. The biological zone is described as undisturbed areas or reclaimed areas of tuff covered with two to five feet of topsoil. It is not clear as to what the risk assessment actually evaluates related to the biological zone. Typically, closure risk assessments are conducted on site levels without the inclusion of institutional controls. In the case of Material Disposal Area P (MDA P), the institutional control is topsoil. Provide the following clarifications:
   - Indicate if the topsoil that covers the reclaimed areas is clean soil that was imported from off-site or if the soil was non-contaminated soil removed from MDA P and set-aside for reclamation.
   - Indicate if the surface soil samples used in the risk assessment represent the topsoil.
   - Discuss if the topsoil is not native to MDA P and was brought in from another area, and the analytical results used in the risk assessment represent the topsoil concentrations, how representative the risk assessment is relative to assessing the actual conditions of MDA P prior to remediation and re-vegetation (i.e., installation of institutional controls).

2. Essential nutrients (i.e., calcium, sodium, magnesium, potassium, and iron) were eliminated from the human health risk assessment. While studies have indicated that calcium, sodium, and potassium are relatively non-toxic, studies have shown there to be an upper intake limit for iron and magnesium. The United States Department of Agriculture (USDA) Food Safety and Inspection Service and the National Academy of Science (NAS) Food and Nutrition Board have developed upper intake levels (ULs) which should applied in determining a soil screening level (SSL) that should be used in assessing essential nutrients toxicity. If site concentrations of magnesium and iron are below the SSL, they may be eliminated from further consideration in the risk assessment. Revise the report accordingly.

3. The risk assessment does not address risks to human health through exposure to contaminants in Cañon de Valle. The report states on more than one occasion that migration of surface water due to run-off and large precipitation events has occurred and that this water eventually drains into Cañon de Valle. Although run-off control measures are currently in place, the text in the report does not convey that the controls have been one hundred percent (100%) effective, and that there has never been a breach of the

control mechanisms. The report does not provide justification that off-site migration has not occurred, and therefore, the potential for contamination in Cañon de Valle from site contaminants must be addressed in the report. Revise the closure report to provide discussion on the potential nature and extent of contamination in Cañon de Valle from contaminant transport from MDA P and how human health risks associated with exposure to these constituents will be evaluated. At a minimum, the report must indicate that the human health risks associated with exposure to contaminants in Cañon de Valle will be addressed in a separate report.

4. For the ecological risk assessment, a screening evaluation was conducted first. For those constituents that did not pass the screening evaluation, additional analysis was conducted. For the biological zone, only barium and high explosive (HE) and RDX were carried forward. However, an actual evaluation of ecological risks within the biological zone was not conducted, but rather an evaluation of potential risks in Cañon de Valle were discussed and used as surrogates. It is not clear why this approach was taken. The biological zone at MDA P and Cañon de Valle are different environments and are affected by different source mechanisms. Two distinct evaluations must be conducted: one for the biological zone using MDA P data and one for Cañon de Valle. Revise the closure report to include an evaluation of the actual risks to receptors to MDA P soil.

5. It appears that the ecological risk assessment for Cañon de Valle was conducted using only data from the overbank soil deposits. It is not clear how a complete assessment using only this data was conducted. The risk assessment must include all complete exposure pathways. Revise the risk assessment to clarify all the data that was used in the assessment of Cañon de Valle and discuss all the exposure pathways evaluated.

6. Discussion of the soil, sediment, and surface water investigations downstream of the site must be included in the report. A comment regarding this was made by NMED in the March 17, 2000 supplemental information request (specific comment #1) for Sampling and Analysis Plan for MDA P. In response to the request, Permittees had stated that details of responsibilities for follow-on activities in Cañon de Valle will be reported in the closure report (August 10, 2000). The Permittees must provide this information.

7. The Sampling and Analysis Plan for MDA P submitted in August 1999, indicated that a surface water monitoring station was to be installed directly below MDA P in Cañon de Valle during the summer of 1999. The report does not include any discussion on data collected from the monitoring station. Provide the information on the proposed monitoring station and include the discussion on data, if any collected, so far.

8. To facilitate the review, a separate table presenting contaminant data from boreholes should have been included. A similar table should also have been included in the report

entitled "Bedrock Fracture Characterization at Material Disposal Area P Site: Phase II Closure Investigation Report (referenced by LA-UR-02-7200 and ER 2003-0467). No response required.

Specific Comments

1. **Executive Summary, Pages iii and iv**
   - The approved closure plan indicated that the Permittees would make an equivalency demonstration for clean closure at MDA P. Include a statement giving reasons why equivalency demonstration is no longer considered a requirement for the site.
   - Include a statement that a separate report will be submitted supporting NFA for SWMU 16-016(c)-99

2. **Section 1.4.3, SWMU 16-016 (c)-99, Page 13**
   Provide the time frame for the storage of barium nitrate on Flash Pad 386 i.e., the period during which barium nitrate pile existed. Provide the dates for installation of erosion control features at the site.

3. **Section 2.3.5.3.1, Eastern Regime-Data Summary and Discussion, Page 42.**
   - Peak concentrations of nitrates detected in the near surface and around 40 ft bgs could be an indication that contaminants have migrated in the subsurface. Nitrates are soluble and highly mobile and barium nitrate is a constituent of potential concern (COPC) at the site.
   - The results of geochemical analysis reported do not concur with the contaminant data. For example, geochemical anion/cation analysis data for borehole 526 indicate that barium was detected at 116 mg/kg in one surface sample (at 0.3 ft) and was below 1 mg/kg in most of the other samples collected at depth. However, the contaminant data presented in the report for borehole 526 indicates that barium was detected at 1800 mg/kg in the surface sample and was detected at 413 mg/kg at 55 ft bgs. Explain the discrepancy.

4. **Section 2.3.5.3.3, Flash Pad 387-Data Summary and Discussion, Page 44, Figure 2.3-5, Page 51**
   High EM conductivity was observed at 35-45 feet below surface and at 65-90 feet below surface in borehole 273. High EM conductivity was also observed at 120-130 feet below ground surface in borehole 273. A corresponding peak in sodium concentration was also observed at that depth in borehole 273. Discuss the significance of high EM conductivity at this depth in the borehole.

5. **Section 2.4.2.2, Borehole Samples, Page 55**
The statement "No organic chemicals are detected below 1 ft bgs in boreholes 516, 554, and 273" is incorrect. HMX and RDX were detected at 35 ft bgs in borehole 554. Additionally, organic chemicals were detected in borehole vapor samples collected from borehole 554 at depths of 76-78 ft. Vapor samples were not collected in boreholes 516 and 273 to determine for the presence of organic chemicals. Several organic chemical compounds were detected in all three boreholes sampled for organic vapors (i.e. boreholes 526, 554, and 557).

6. **Section 2.4.3, Confirmation Sampling Results, Pages 62 - 68.**
Several organic chemicals were eliminated as a COPC based upon low detection frequencies. The Environmental Protection Agency (EPA) guidance (*Risk Assessment Guidance for Superfund* [RAGS], 1989) cited in the closure report allows for the elimination of chemicals from a risk assessment if it is detected infrequently (e.g., less than 5% per 20 samples with prior approval from NMED), not detected in other sampled media, and/or if there is no reason to believe the chemical may be present. However, RAGS clearly states that, "chemicals expected to be present should not be eliminated" from the risk assessment. The closure report provides evidence that these constituents have been historically present at the site, and a review of waste data collected in 1999 and 2000 indicate the presence of these constituents in waste removed from the site. Thus, there is sufficient justification to warrant the inclusion of these constituents in the risk assessment. At a minimum the risks from these constituents should be evaluated separately, and overall risks associated with these COPCs included and excluded be compared. Revise the risk assessment to include all organic constituents that have been historically present on-site, regardless of detection frequency. For the biological zone, the risk assessment should include benzoic acid, 1,4-dichlorobenzene, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 3-nitrotoluene, 4-nitrotoluene, and tetryl. For the exposed tuff zone, the risk assessment should include di-n-butyl phthalate, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-methylnaphthalene, 4-nitrotoluene, and tetryl.

7. **Table 2.4-7, Page 64 and Appendix A, Table 3.2.1-1.**
The background soil value listed for aluminum and vanadium is 29,900 mg/kg and 36.6 mg/kg respectively. This appears to be a typographic error, as the soil background value should be 29,200 mg/kg for aluminum and 39.6 mg/kg for vanadium, as noted in Table 6.0-1 of the document *Inorganic and Radionuclide Background Data for Soil, Canyon Sediments, and Bandelier Tuff*, LANL 1998. Revise the tables accordingly.

8. **Section 2.4.3, Confirmation Sampling Results, Table 2.4-11, page 67 - 68.**
The table does not include references to which compounds were eliminated based upon the less than 5% detection frequency. Revise the table to include this notation (similar to table 2.4.10).

9. **Section 2.5.3.1.1, Screening Results, Page 85**
The report states that the operational PRG of 2000 mg/kg for barium was exceeded in four grid cells. According to the data provided on a CD entitled "Material Disposal Area P Site Closure Certification Report", the PRG of 2000 mg/kg for barium was exceeded in 10 grid cells (i.e. in grid cells 006, 232, 370, 454, 491, 551, 592, 630, 670 and 742). Additionally, Figure 3.1-1; map of MDA P Area Phase II confirmation samples does not depict any samples collected from grid number 006. Clarify the discrepancy and make appropriate revisions.

10. **Section 2.5.3.3.1, Screening Results, Page 89.**
Version 1.4 of the ECORISK database was used. Provide justification for not using version 1.5, which was released in September 2002. In addition, several COPCs were eliminated from the assessment, as the data provided in ECORISK was less than background and thus, deemed not appropriate for use. Discuss why other sources for ecological toxicity data were not used in these cases.

11. **Section 2.5.3.3.2, Problem Formulation, Page 89.**
The text states that chemicals with seven or fewer detections in soil above the soil background value are rendered inaccessible to receptors. This is not a valid statement. First, 100% of the site was not sampled, and secondly, the lower detection frequency above background does not render the chemicals inaccessible, rather it lowers the potential for exposure but does not eliminate it. Revise the text to remove the discussion on these chemicals being inaccessible to receptors due to low frequency of detection above background. In addition, there is reasonable evidence to conclude that these chemicals are present at the site due to site activities. The exclusion of these chemicals as COPCs based upon the low frequency of detections is not valid (unless the statistical analyses concludes otherwise) and does require prior approval from NMED. Revise the risk assessment to address risk associated with exposure to these constituents.

12. **Section 2.5.3.3.2, Problem Formulation, Page 93**
The report states that bis[2-ethylhexyl]phthalate was detected in eight samples, but the data provided on a CD entitled "Material Disposal Area P Site Closure Certification Report" shows that bis[2-ethylhexyl]phthalate was detected in 15 samples (i.e. at locations 16-20196, 16-20232, 16-20233, 16-20277E, 16-20300, 16-20404, 16-20477, 16-20513, 16-20549, 16-20551, 16-20558, 16-20630, 16-20670, 16-20702T and 16-20742). Clarify the discrepancy.

13. Section 3.3, Discussion of Groundwater Transport Pathways at MDA P, Page 108 - 110

- In addition to the factors identified as controlling the downward transport of contaminants, ponding and disturbed/undisturbed mesa top shall be considered, because they have been demonstrated to be important factors in controlling the downward movement of contaminants. As a result of the recent remediation activities, at present, ponding conditions may not exist at the site, but regular inspections should be done to ensure that it is maintained in the future.
- There is no conclusive evidence presented in the report that supports the statement that there was little impact to Cañon de Valle from MDA P due to overland flow. Stormwater runoff samples collected in 1998 from interceptor trenches located between MDA P and Cañon de Valle clearly indicated contaminants associated with the barium nitrate pile had migrated down a natural drainage towards Cañon de Valle (Sampling and Analysis Plan for Material Disposal Area P, August 1999, page 15). Best management practices that were in place in 1998 were probably not in place in 1950s, when the barium nitrate pile was present. However, due to the similar nature of the contaminants upstream and downstream of MDA P, it may be difficult to distinguish the different sources of contamination in Cañon de Valle. The mechanisms of addressing existing contamination in Cañon de Valle should be discussed here.
- The statement that VOC pore gas sampling results show a decrease in concentration with depth (Table 2.4-6) is not correct, on the contrary many of the concentrations increase with depth and the vertical extent may not have been determined since samples were only taken at two depths per borehole.
- Barium, RDX and HMX were detected in boreholes 554, 557 and 526 at depth indicating that contamination has moved in the subsurface. Sample results contradict the statement "The data also indicate that concentrations of contaminants have not accumulated in the subsurface beneath MDA P." Barium was detected at 413 mg/kg in borehole 526 at about 55 ft, the last depth sampled. RDX and HMX were also detected at this depth. Barium was detected at 715 mg/kg at about 19 ft and at 406 mg/kg at about 37 ft, RDX was detected at 3.9 mg/kg at about 19 ft depth in borehole 557.
- Include a statement that a separate VCA Report for SWMU 16-016(c)-99 will be submitted supporting NFA recommendation.

14. Appendix A, Section 3.3, Page 13.

The risk assessment is based upon a depth of exposure of zero to five feet, and the 95% UCL was determined from concentrations within this range. It is unclear why a range of zero (0) to five (5) feet was assumed an appropriate exposure pathway. EPA defines surface soil as 0 to 0.5 feet and subsurface soil as below 0.5 feet. Typically a risk assessment will evaluate exposure to surface and subsurface soil separately, not combined

as in the closure report. It appears that the development of one 95% UCL to represent all soil is not a conservative approach and most likely underestimates the actual risks that could be received through exposure to surface soil. This assumption is based upon the fact that concentrations decrease with depth. Revise the risk assessment to include an assessment for surface soil (0 to 0.5 or 0 to 1 foot) and one for subsurface soil (below 0.5 or 1 foot).

15. **Appendix A, Section 4.2.3, Page 17.**
The text states, "For the biological zone, a single detection of barium in grid 189 was measured...and results in an HQ of 1.3. However, this barium concentration was within the other concentration evaluated in the residential lots." It is not clear what meaning these sentences are trying to convey. It appears that the elevated HQ is typical of the rest of the site, and therefore, unacceptable risks would prevail across all residential lots, which contradicts the conclusion of the report. Clarify the text.

16. **Appendix A, Section 4.2.3, Page 17.**
It is not clear how the residential lots were chosen. It is also not clear how many lots were evaluated. Based on Figure 1.5-2, it appears that only two lots were evaluated. The primary focus for this evaluation also appears to be barium and noncarcinogenic risks. However, the report does not discuss potential exposure to organics and other carcinogens. If the worst-case location for noncarinogenic risks was evaluated, then the worst-case location for potential carcinogenic risks should have also been evaluated. Revise the text to indicate how many lots were evaluated, the methodology for selection of the lots, and the representativeness of the evaluation for potential exposure to organics and carcinogenic risks.

17. **Appendix A, Section 4.2.5, Page 21.**
NMED target cancer risk level is 10^{-5} not 10^{-6} as noted in paragraph 3. This appears to be a typographical error. Revise the statement.

18. **Appendix A, Section 5.3.2.3, Page 29.**
Barium and HMX were not included in the screening assessment, as the ECORISK version 1.4 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. Revise accordingly.

19. **Appendix A, Section 5.6.3, Page 40.**
The conclusion of the risk assessment indicates that there is no adverse impact to Cañon de Valle from migration of contaminants from MDA P. However, risk assessments

conducted on Cañon de Valle for other sites within Technical Area (TA) 16, specifically in conjunction with Solid Waste Management Unit (SWMU) 16-021(c)-99, which is slightly upgradient of MDA P have indicated otherwise. This SWMU 16-021(c)-99 ecological risk assessment provides a lengthy discussion on the results of toxicity testing that had been conducted to determine whether the concentrations in sediments have impacted the benthic macro-invertebrate community. The results of the study showed a decrease in the 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. However, the report further 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. Revise the report to address these issues.

20. **Appendix A, Figures, Figure 3.3.2-8, Iron samples above background Level.**
There appears to be a typographical error, sample # 0816-01-0027 is depicted at two different locations on the map. Revise the figure depicting the correct sample IDs and locations.

21. **Appendix A, Attachment 2, Page Att. 2-11**
The detected value of silver (2.9 mg/kg) is not depicted on Figure B-2a. Revise the figure to include the detected value for silver.

22. **Appendix A, Attachment 2, Page Att. 2-25**
Silver was detected above background values both in soil and tuff as shown in Table 2.4-7. However, Figure B-16a, Box and Whisker Background Comparison for silver in Biological Zone, does not depict plots for silver in soil. Revise the figure to include detected values of silver in soil.

23. **Appendix A, Tables 4.2.2-1, 4.2.2-2, 4.2.3-1, and 4.2.3-2.**
Attachment 2 of Appendix A discusses the statistical methods that were used to determine the 95% UCLs. However, two tests for lognormal distributions are discussed. It is not clear which test (either the Land's H or MVUE) was applied for estimating the 95% UCL in cases of lognormal distributions, as the table does not note which test was applied. For all normal distributions it was assumed that the Student T test was used and

for non-parametric, the Bootstrap method. Clarify which tests were used for each constituent when the distribution was normal/lognormal.

24. Appendix A, Table 4.2.2-3.

The 2003/2004 EPA Region 6 SALs for residential soil were reviewed and compared against the SALs listed in Table 4.2.2-3. Consideration was given for the data of the report versus dates of updated toxicity data. Two comments on the table are noted:

- There is a large discrepancy between the SAL for cobalt as listed in the table (4,500 mg/kg) and in the Region 6 SAL table (900 mg/kg). Review of toxicity data does not indicate that there have been any updates. Verify the SAL for cobalt.
- Clarify that Arochlor-1254 was used as a surrogate for Arochlor-1260.

25. Appendix A, Table 4.2.2-4 and 4.2.3-6.

Both beryllium and cobalt are carcinogenic via inhalation, and as such, carcinogenic effects should be evaluated. Revise the tables and risk assessment to include beryllium and cobalt.

26. Appendix B, Pages B-6 and B-7

The nomenclature for sampling ID numbers noted in the report is incorrect. Using the example given in the report, for sample ID 0816-01-0322, 0322 is supposed to indicate that sample was taken from grid 322, this does not appear to be correct. Instead the last three digits of location ID appear to be indicating the grid number, for example, for location ID 16-20624, 624 appears to be the grid number. Clarify and revise the text.