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RETURN RECEIPT REQUESTED

March 14, 2005

David Gregory, Federal Project Director
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 DISAPPROVAL
LOS ALAMOS AND PUEBLO CANYONS INVESTIGATION REPORT
LOS ALAMOS NATIONAL LABORATORY (LANL)
EPA ID #NM0890010515
HWB-LANL-04-006

Dear Messrs. Gregory and Nanos:

The New Mexico Environment Department (NMED) is in receipt of the *Los Alamos and Pueblo Canyons Investigation Report,* (Report) dated June 2004 and referenced by LA-UR-04-2714 (ER2004-0027). NMED has reviewed this document and hereby issues this Notice of Disapproval. The Department of Energy and the Regents of the University of California (collectively, the "Permittees") must respond to the comments as outlined in this letter within forty-five (45) days of receipt of this letter.

General Comments:

1. The results of the statistical analyses to determine distribution and the 95% upper confidence limit (UCL) were not provided. As such, a review of the selection of the appropriate statistical test and derivation of the UCL could not be completed. The

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Permittees must provide the results for the distribution testing and the UCLs. Also, the Permittees must provide discussions of other statistical parameters and assumptions used in these calculations.

2. Many of the values used for food product intake parameters were based upon the 1997 "Exposure Factors Handbook". However, in March 2003, EPA (through the National Center for Environmental Assessment, NCEA) updated Chapters 9, 10, and 11 of the "Exposure Factors Handbook" with the "CSFII Analysis of Food Intake Distributions" (EPA/600/R-03/029). The updated data reveal some potential discrepancies in the ingestions rates (e.g., vegetable, fruit, and meat) applied in the risk assessment. The Permittees must revise the risk assessment to incorporate the most current data contained in the "CSFII Analysis of Food Intake Distributions."

3. Dioxin and furans were not included in the risk assessment. The Permittees state in the Report that an agreement between the Permittees and NMED had been reached to not include these constituents in the risk assessment, as noted in *Katzman 2002*. This agreement refers to the approach to determining contaminants of concern for the ecological risk assessment. The data that were presented to NMED to illustrate decreasing trends from SWMU 73-002, the likely major contributor of dioxins to Pueblo Canyon, and to justify not including these constituents are incomplete. The data set does not include all of the dioxin and furan congeners. For the six samples collected closest to Pueblo Canyon in three of the drainages leading from the SWMU, the Permittees only present a complete congener list for one sample. In an additional drainage, the sample collected was not analyzed for dioxins and furans. The Permittees state in the aforementioned agreement that they only have post-fire data. Because the data set is not complete, the Permittees are unable to determine which of the dioxins/furans are related to the fire, which is important to know to determine risks from LANL operations. The Permittees must collect additional sediment data and then revise the risk assessment.

Specific Comments:

1. Section 3.0 Scope of Activities

Permittees Statement: " The scope of activities of this report include investigations of sediment, surface water, alluvial groundwater, and biota in the Los Alamos and Pueblo watershed, as presented in the NMED-approved Los Alamos amd Pueblo Canyons work plan (LANL 1995, 50290; LANL 1997, 56421), subsequent addenda, and related documents (LANL 1998, 59373; LANL 1999, 65144; Katzman 2002, 73667; LANL 2002, 70235)."

NMED Comment: The investigation activities included in this report do not include all data that NMED needs to determine if corrective measures are required in the Los Alamos and Pueblo

watershed. Numerous data have been collected at the Water Quality and Hydrology Group's storm water monitoring stations and at additional locations by the Environmental Restoration Group in these canyons that have not been reported or evaluated in this Report. These data are critical for NMED to determine if contaminants are being transported down canyon and beyond the Facility boundary. Surface water sampling data provided in this report do not provide available information. In addition, the Permittees state in the addendum to the Los Alamos and Pueblo Canyons Work Plan that "[o]ther relevant data collected by the Laboratory Water Quality Group (ESH-18) (e.g., storm water runoff, alluvial groundwater, and sediment) will be used to assess the fate and transport of contaminants and to support the development of an assessment of potential future impacts that may be caused by contaminant migration." The Permittees must submit all relevant storm water monitoring data from Los Alamos and Pueblo canyon watershed, including data from gaging stations. The data must be compared to relevant and applicable DOE-derived concentration guidelines and WQCC standards. The data must include data collected before and after the Cerro Grande fire.

2. Section 6.1 Data Preparation, pg. 6-1:

NMED Comment: Several organics were eliminated as constituents of potential concern (COPCs) based upon low detection frequencies (less than 5%). It is agreed that this rule of detects is consistent with both Environmental Protection Agency (EPA) and NMED guidance. However, the investigation report references Katzman 2002 as documenting an agreement between LANL and NMED on applying the 5% detect rule. This reference does not address frequency of detects nor the elimination of COPCs based on this rule. In addition, even though the 5% frequency of detects has been approved and applied at other areas within the LANL facility, this does not necessarily mean that the approach is automatically appropriate for other sites. The EPA guidance (*Risk Assessment Guidance for Superfund* [RAGS], 1989) allows for the elimination of chemicals from a risk assessment if it is detected infrequently (e.g., less than 5% per 20 samples), 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. It appears that many constituents that are expected to be present as a result of site activities were eliminated as COPCs based on the 5% detection rule (e.g., plutonium-239). As such, the inclusion of these constituents in the risk assessment is warranted. At a minimum, the risks from these constituents should be evaluated separately, and overall risks, with the COPCs included and the COPCs excluded, should be compared. The Permittees must either revise the risk assessment to include all organic constituents that have been historically present on-site, regardless of detection frequency, or provide specific documentation between LANL and NMED, which references the agreement of the 5% detection frequency specifically addressing the Los Alamos and Pueblo Canyons investigations and risk assessments.

3. Sections 6.2.2.1 Terrestrial Ecological Screen and 6.2.2.2 Aquatic Receptor and Pathway Ecological Screen, pg. 6-5:

NMED Comment: Individual analytes are not retained as contaminants of potential ecological concern (COPECs) if the hazard quotient (HQ) for the detected result is less than or equal to 0.3. The Permittes must provide justification for setting the screening limit to 0.3. The Permittees must also discuss looking at the overall hazard index (HI) and percent contribution of chemicals to the HI.

4. Section 6.2.3.3 Evaluation of Tier 2 Sediment COPCs for Human Health Risk Assessment, pg. 6-8:

NMED Comment: The Permittees do not include europium-152, thorium-228, thorium-230, or thorium-232 in the human health risk assessment. The Permittees claim that available data show that there are no LANL sources for these radionuclides. The document titled *Formerly Utilized MED/AEC Sites Remedial Action Program (May 1981)* provides data to the contrary. Thorium-232 was detected in samples collected at the former outfall drainages and in Acid and Pueblo Canyons. In addition, europium-152 was detected in samples collected at one of the former outfalls from the former Central Waste Water Treatment Plant (SWMU 0-019). The radionuclide data collected during this investigation should have been included in the human health risk assessment in this Report. Proximity to potential sources is not a valid consideration when there is no other explanation for the presence of these constituents.

5. Section 6.3.1 Identification of Surface Water and Alluvial Groundwater COPCs, pg. 6-9:

NMED Comment: In addition to detection frequency, the Permittees should have used other screening criteria to determine organic, inorganic, and radionuclide COPCs in alluvial groundwater, especially because of the interconnection of the surface water with underlying groundwater zones and the possible impact to other groundwater zones from alluvial water contaminants. The applicable criteria may include the EPA Region 6 Tap Water Preliminary Remediation Goals (PRG), the Region 9 Tap Water PRG (if there is not a Region 6 standard), the NMWQCC standards, and the EPA Maximum Contaminant Levels. The Permittees must reevaluate their list of alluvial groundwater COPCs using the applicable standards.

6. Section 6.3.3.2 Tier 2 Human Health Screen, pg. 6-11:

NMED Comment: The report indicates that all analytes with similar toxicological effects (carcinogens) were eliminated as Tier 2 COPCs for each location and field preparation combination if the HI was less than or equal to 10 for carcinogens. For the Tier 1 screening, using a HI of 10 as the screen was appropriate where the screening action level (SAL) was based upon a risk level of 1E-06. However, for the Tier 2, it appears that regardless of the risk basis of

the SAL, a criterion of 10 is being used. This is not appropriate, as a COPC could have an associated risk between 1E-05 and 1E-04, which is above the NMED acceptable target risk of 1E-05. The Permittees must clarify the target risk for the Tier 2 analysis.

7. Section 6.3.3.3.1 Groundwater, pg. 6-11:

NMED Comment: The text indicates that due to low frequencies of detection, false positives, and potential upgradient sources, some contaminants detected in groundwater are not representative of contaminant releases from the watershed areas. However, a soil-to-groundwater screening (SSL) was not conducted. Typically generic SSLs, based upon a dilution attenuation factor of 20, are compared to the maximum concentrations of detected contaminants in soil to determine whether the level of contaminant could potentially pose a threat to groundwater. Conducting this analysis would also provide additional justification that the detections in groundwater are not due to contamination present within the watersheds. The Permittees must revise the risk assessment to include an analysis of site concentrations to SSLs.

8. Sections 6.3.3.3.1 Groundwater and 6.3.3.3.2 Surface Water, pg. 6-11 and 6-12:

NMED Comment: The Permittees eliminated several COPCs based on low frequency of detection. See comment #1.

The Permittees use EPA's 10 times rule to eliminate methylene chloride as a COPC. However, this rule applies to samples in which a constituent was detected and for which an associated laboratory blank contained that same constituent. The Permittees must provide the laboratory reports to show that methylene chloride was detected in the blank samples. In addition, the Permittees are reminded that methylene chloride has been used in LANL processes and should not be eliminated for this reason alone.

9. Section 7.2.2.1 Spatial Distribution & Sources of Radionuclides in Water, pg. 7-27:

Permittees Statement: "Downcanyon detections of strontium-90 in surface water, including at the sampling location LA-Background SW in the background sediment investigation reach, are interpreted to be related to the presence of ash deposited within channel sediments."

NMED Comment: The Permittees cannot use ash deposited in channel sediments as the sole reason for down canyon detections of strontium-90 in surface water, even if it is true that some of these detections could be related to ash deposits since the detections were found upcanyon from laboratory sources as well.

10. Section 7.2.4 Organic Chemicals in Water, Diesel-Range Organics, pg. 7-39:

NMED Comment: The Permittees state that "the identification of highest detected DRO concentrations in surface water at the head of the canyon, upgradient of the DP Tank Farm, suggests that the low DRO concentrations may be related to runoff from townsite." There is a SWMU (0-027) at the head of DP Canyon. The former drum storage area and aboveground storage tanks are responsible for volatile organic contaminants in the subsurface (>10 feet) and have recently been subject to remediation. Therefore, the presence of DRO at the head of DP Canyon may not be due solely to townsite runoff.

11. Section 8.2.Site-Specific Human Health Risk Assessment, pg. 8-32:

NMED Comment: The construction worker scenario does not present the worst-case risks to a construction worker for construction activities that may take place in areas other than those identified in this report. Even though the Permittees do not foresee construction activities occurring in areas of contaminated sediments (e.g., flood plains), the Permittees cannot guarantee this will not occur. The Permittees must demonstrate that risks to construction workers in these areas would be less than or equal to the risks currently evaluated. NMED recommends the Permittees work closely with Los Alamos County to identify other areas of potential construction.

NMED agrees that the residential exposure scenario is not a reasonably foreseeable land use for the entire canyon bottom. However, the Permittees are reminded that the future land use may change in any part of the canyon and recommends using this scenario in addition to the extended backyard and trail user scenario at the locations of greatest contamination to further support risk-based decisions.

12. Section 8.2.5.2 Carcinogenic Effects, Construction Worker Scenario in Pueblo Canyon, pg. 8-46:

NMED Comment: The Permittees state that "[s]ediment data for carcinogenic organic chemicals were not collected for reaches P-2W, P-2E, and P-3W, in the vicinity of planned construction work for a new wastewater treatment plant." The Permittees offer no explanation for not collecting these data. In the report titled *Evaluation of Sediment Contamination in Pueblo Canyon, Reaches P-1, P-2, P-3, and P-4*, the Permittees present data for carcinogenic organics detected in all four reaches. Even though aroclor-1260 was the only organic chemical detected in reaches P-2 and P-3, several years have passed and the potential to detect higher and/or different chemicals (from upgradient reach P-1) exists. The Permittees must explain the reason for the incomplete data set.

13. Section B-2.4.4 Conceptual Model for Solute Transport, Surface Water/Groundwater Interaction, pg. B-14:

Permittees Statement: "Data from a direct current (DC) resistivity survey conducted in reach DP-2 indicate that groundwater recharge from alluvium to underlying bedrock does not occur. Results of the geophysical survey and drilling information indicate that the top of the Bandelier Tuff contains copious clay weathering products and provides a barrier to downward migration of groundwater."

NMED Comment: This statement is misleading. Uranium, perchlorate, nitrate, and other contaminants have been detected in intermediate groundwater and in the vadose zone at LANL. Migration to subsurface and communication between the surface and the underlying groundwater zones occurs and is well documented.

14. Section E-2.1.1 Calculating UCLs, pg. E-3:

NMED Comment:

(a) For lognormal distributions, the lognormal UCL method from Gilbert (1987) was applied. The test in Gilbert (the Land H test) is not always appropriate for every data set. As discussed in EPA 2002 (*Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*), the Land H test may not be appropriate for small sample sizes (less than 30) or when the skewness of the data set is high. In these cases, either the Chebyshev 99% or Chebyshev 95% test may be more appropriate. Each data set should be examined and the most appropriate test based on the individual characteristics of the data set should be applied as recommended in EPA 2002, instead of automatically selecting one test for all data sets with lognormal distributions. The Permittees must discuss the appropriateness of the Land H test to each of the data sets. The Permittees will modify the UCL using other tests as warranted.

(b) When the data fit neither a normal or lognormal distribution, the Permittees applied the Chebyshev Inequality method in determining the UCL. If the data sets have a high degree of skewness, the 95% Chebyshev method may not be as effective in estimating the UCL and a higher confidence coefficient (i.e., 99%) should be used. The Permittees must discuss whether the skewness of each data set was determined and discuss whether a confidence coefficient of 95% or 99% was applied. If skewness was not determined, and all UCLs were estimated based upon a confidence coefficient of 95%, then the UCLs shall be revised and estimated using the appropriate confidence coefficient.

(c) When the data are different from both normal and lognormal distributions, the Permittees applied the Chebyshev method. The Permittees must discuss which confidence limit was applied for the test: 95% or 99% and discuss whether the applied confidence limit resulted in a robust analysis of the UCL.

(d) The text indicates that when the data are different from both normal and lognormal distributions, the Chebyshev method was applied. The Permittees must discuss whether the data were tested for any other distributions other than normal or lognormal (e.g., gamma distribution). Also, the Permittees must discuss the appropriateness of applying the Chebyshev method to all data sets, versus application of other test methods such as bootstrapping.

(e) When the data sets consist of less than three (3) values, the test method listed on pages 141 and 142 of Gilbert (1987) was applied. However, the nonparametric confidence limit for quantiles methodology described in Gilbert is only applicable for data sets with greater than 20 samples. For sample sizes of less than 20, Gilbert recommends that the Conover method be used. Clarify how the UCL was estimated for these small data sets. Typically with three or fewer values in a data set, the maximum detected concentration is used as the exposure point concentration.

15. Section E-5.1.1 Chemical Hazard, pg. E-36:

NMED Comment:

(a) The inverse of the mean concentration at the center of a 30-acre square source (Q/C) is listed as 46.84 g/m^2-s per kg/m^3. However, no reference is provided for this value. It is noted that the Q/C for a 30-acre square source in Albuquerque is 43.37 g/m^2-s per kg/m^3 (EPA Soil Screening Guidance, 1996). The Permittees must provide the reference and the rationale for the derivation of the value used for Q/C.

(b) The equivalent threshold value of wind-speed at seven meters (U_t) is 4.124 m/s. However, no reference is provided for this value. It is noted that U_t for Albuquerque is listed as 11.32 m/s (EPA Soil Screening Guidance, 1996). In addition, no references are provided for the height above the surface (Z) and the surface roughness height (Z_0). The Permittees must provide the references and the justification for use for these parameters.

16. Table E-5.3-1, Exposure Parameters for Soil and Water Risk Calculations, page E-305:

NMED Comment:

(a) The particulate emission factor (PEF) listed for the trail user is based upon the December 2000 version of the NMED Soil Screening Levels (SSL). However, the PEF was updated in the October 2003 version of this document. In addition, the PEF as presented in the NMED document is based upon a source area of 0.5 acres squared, not 30 acres squared, as applied throughout the risk assessment. If the NMED PEF were modified to incorporate a Q/C based on a 30-acre square source, the resulting PEF would be

approximately 3.8E09 m^3/kg. The Permittees must revise the PEF for the trail user to reflect the update as listed in the 2003 NMED SSL Guidance and to be based upon a 0.5-acre square source.

(b) The Permittees must clarify why an adult resident body weight of 60 kg versus the standard 70 kg was used in the radionuclide dose calculations.

17. Table E-5.3-2, RESRAD Input Values for Calculations of RBCs, pg. E-311:

NMED Comment: A different site utilization rate was applied for each of the receptors for the RESRAD modeling versus those used for the chemical risk assessment. It is not clear why different utilization rates were applied. For example, the chemical risk assessment is based upon the assumption that the resident spends 100% of his day at home, while the RESRAD modeling only accounts for 96% of the time. Similarly, the construction worker in the RESRAD modeling is based upon a 5.5-hour day, while the chemical risk assessment is based upon an 8-hour day. The Permittees must clarify these discrepancies in the utilization rates for each receptor.

18. Table E-5.3-5, Analyte-Specific Parameter Values for Calculating Dermal Absorption and Biotic Uptake, pg. E-315:

NMED Comment: While most of the values provided in the table could be crosschecked, not all values could be verified, as no references were provided. The Permittees must provide the reference used for obtaining each datum listed in the table.

Should you have any questions, please feel free to contact Darlene Goering at (505) 428-2542.

Sincerely,

James Bearzi
Chief
Hazardous Waste Bureau

JB:dg

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