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**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

September 14, 2006

David Gregory
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David McInroy
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**RE: NOTICE OF DISAPPROVAL FOR THE INVESTIGATION REPORT FOR THE
TA-16-340 COMPLEX [CONSOLIDATED UNITS 13-003(a)-99 AND 16-003(n)-99
AND SOLID WASTE MANAGEMENT UNITS 16-003(o), 16-026(j2), AND 16-
029(f)]
LOS ALAMOS NATIONAL LABORATORY, NM0890010515
HWB-LANL-06-005**

Dear Messrs. Gregory and McInroy:

The New Mexico Environment Department (NMED) has received the *Investigation Report for the TA-16-340 Complex [Consolidated Units 13-003(a)-99 and 16-003(n)-99 and Solid Waste Management Units 16-003(o), 16-026(j2), and 16-029(f)]* (Report), dated January 2006 and referenced by LA-UR-06-0153/ER2005-0678). NMED has reviewed this document and hereby issues this notice of disapproval. The Department of Energy and the Los Alamos National Security, LLC (collectively, the Permittees) must respond to the comments as outlined in this letter within thirty (30) days of receipt of this letter. All submittals (including figures) must be in the form of two paper copies and one electronic copy in accordance with Section XI.A of the Order on Consent (Consent Order).



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General Comments:

1. The Permittees depict "Not detected" and "Not analyzed" with the same symbol on their data tables. Even though this information is presented elsewhere in the Report, different symbols should be used for these designations when depicted on tables in the future.
2. The Permittees have indicated that the ecological risk assessment will be revised following the additional investigation and removal activities for SWMU 16-003(o). The Permittees must also revise the human health risk assessment for SWMU 16-003(o) once the additional investigation and remediation activities are completed.

Specific Comments:

1. Section 5.0 Removal of Human-made Fixtures, Structures, and Soil, pg. 21:

NMED Comment: The Permittees report that "[a]s part of the D&D operations, six sumps and approximately 300 ft of interconnecting drainline were removed at former Building 16-340." According to Section 5.3 of the Report, the interconnecting drainlines between the sumps consisted of several 3-foot segments and appeared to be in good condition following excavation. However, sampling in the area of the sumps indicates that there were leaks in the sumps and/or the sump/drainline connections. The Permittees did not collect samples beneath the interconnecting drainlines as part of this investigation and must, therefore, investigate beneath the drainlines, specifically in the locations where the drainline segments were connected. The Permittees must drill a borehole between each of the sump areas and collect samples from the native material directly beneath the former drainline segment locations. The Permittees must determine the extent of any contamination detected based on laboratory analyses.

2. Section 7.1.2 Confirmation and Investigation Sampling, pg. 28:

NMED Comment: According to Figure 11a of the approved work plan, the Permittees proposed to collect soil samples at locations along the path between sumps 108/109 and the former fishladder structure. Instead, the Report indicates that samples were collected in the area of the drainline. The Permittees did not definitively determine the location of the drainline in the work plan, and so the Permittees must discuss this deviation from the work plan. The Permittees must also discuss the condition of the removed drainline (between Manhole MH 811 and the former fishladder structure) and provide rationale for collecting all of the samples underneath the drainline in one concentrated area.

3. Section 7.10 Subsurface Pore-gas Sampling, pg. 38:

NMED Comment: In accordance with the work plan, the Permittees collected samples from each of the intermediate boreholes at the total depth of the boreholes (200 feet) during the first round of pore-gas sampling. However, this interval was not sampled during the second round of

sampling. The Permittees must provide a discussion to address this deviation from the work plan.

4. Section 7.12 Subsurface Pore-gas Laboratory Analytical Results, pg. 39:

The Permittees state that the “concentrations tended to increase with depth and increased from the first round to the second round.” The Permittees must graphically present this information (and any subsequent sampling data) to clearly show any trends for each borehole because the contamination trends with depth and time are not clear from the data presentation.

5. Section 9.1 Additional Data Requirements, SWMU 16-003(o), pg. 44:

Permittees’ Statement: “The first proposed borehole (Location 16-23591) corresponds to a tuff sample collected at approximately 4.5 ft bgs where benzo(a)pyrene was detected at a concentration that exceeded the industrial SSL.”

NMED Comment: The reported detections of benzo(a)pyrene do not exceed the industrial SSL in any of the sump samples. The Permittees must clarify this statement.

Also, Plate 7 depicts metals contamination remaining above background concentrations at SWMU 16-003(o) for various metals. In addition to the data requirements identified, the Permittees must determine the vertical extent of contamination for TAL metals at the following sump locations: 16-23607, 16-23611, and 16-23613.

6. Section 9.4 Procedures and Reporting, pg. 46:

NMED Comment: The Permittees propose to submit an addendum to this Report within 90 days after receipt of the data. Instead, the Permittees must submit a separate investigation report titled Phase II Investigation Report for the TA-16-340 Complex within 90 days of receipt of the data.

7. Section B-5.1 Inorganic Chemicals in Soil and Tuff, pg. B-6:

NMED Comment: While studies have indicated that calcium, sodium, and potassium are relatively non-toxic, other studies have shown there to be an upper intake limit for iron. The United States Department of Agriculture Food Safety and Inspection Service and the National Academy of Science Food and Nutrition Board have developed upper intake levels (ULs), which should be applied in determining a soil screening level (SSL) that, in turn, should be used in assessing essential nutrients toxicity. If site concentrations of iron are below this SSL, then the concentrations may be eliminated from further consideration in the risk assessment. The Permittees shall revise the report accordingly.

8. Section B-5.3 Radionuclides in Soil, pg. B-8:

NMED Comment: The Permittees report that one soil sample was inadvertently analyzed for isotopic uranium and that uranium-234, -235, and -238 were detected at levels greater than their respective background values. The Permittees state in Appendix B to the approved Work Plan that radionuclides are only potential contaminants at SWMU 13-003(a)-99. However, the 1990 SWMU Report for TA-16 reports that "radioactive wastes are also present in some of the sumps." The Permittees should analyze for isotopic uranium during all subsequent sampling at the SWMUs included in this Report.

9. Section B-8.3-1 Inorganic Chemicals, pgs. B-22 and B-26:

NMED Comment: The Permittees claim that the vertical extent of cobalt is defined within Fishladder Canyon by the two intermediate-depth boreholes (Locations 16-23691 and 16-23692). The cobalt detection at locations 16-23693 and 16-23749 (two sample locations most downgradient from the fishladder) are above background levels in tuff (84.6 ppm and 89.9 ppm, respectively). These elevated detections are approximately 1,200 feet downgradient from location 16-23692. It is not appropriate to use data collected from 1,200 feet away to determine vertical extent. The Permittees must determine vertical extent of cobalt at locations 16-23693 and 16-23749.

The Permittees also claim that vertical extent of silver is defined at SWMU 16-003(o). Silver was detected in a tuff sample collected at 2.8-3.5 feet below ground surface at location 16-23693. The concentration detected was greater than four times the background level. Because this is the deepest sample that was collected in this part of the SWMU and location 16-23692 is too far away (approximately 1,200 feet) to be used to determine vertical extent, the Permittees must collect additional samples to determine vertical extent for silver at this location.

10. Section B-8.3-2 Organic Chemicals, Former Building 340 Drainline Area, pg. B-28, first paragraph:

NMED Comment: The Permittees state that several organic compounds were detected in fill and/or tuff at several locations along the former Building 340 drainline. The Permittees also state that the vertical extent of these contaminants has been defined with the deepest interval in borehole 16-23691. The closest sampling location to borehole 16-23691 along the drainline is approximately 360 feet upgradient. It is not appropriate to use data collected from this borehole to determine vertical extent along the drainline. The Permittees must collect additional samples along the drainline to determine extent for these contaminants.

At sampling locations along the drainline from former 16-340 building, the concentrations of several constituents increase with depth. The Permittees must determine extent of these contaminants at the following locations.

- 16-24894: acenaphthene, anthracene, benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzofuran, fluoranthene.
- 16-24896: acenaphthene, anthracene, benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene.
- 16-24899: benzo(a) anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene.
- 16-24891: benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene.

11. Section B-8.3-2 Organic Chemicals, Former Fishladder Structure, pg. B-28, first paragraph:

NMED Comment: The Permittees state that several organic compounds were detected in soil and/or tuff along the upper half of the former fishladder structure. The Permittees also state that the vertical extent of these contaminants has been defined in boreholes 16-23691 and 16-23692. It is not appropriate to use these boreholes to determine vertical extent of contamination in the fishladder area because they are located approximately 70 and 250 feet downgradient, respectively. The Permittees must collect additional samples in the former fishladder structure area to determine extent for these contaminants.

12. Section B-8.3-2 Organic Chemicals, Former Fishladder Structure Area (Lower Half) and Downgradient, pgs. B-29-B-30:

The Permittees state that several organic compounds were detected in samples collected along the lower half of and downgradient from the former fishladder. The Permittees also state that the vertical extent of these contaminants has been defined with the deepest interval in borehole 16-23692. While it may not be appropriate to use this borehole to determine vertical extent for some of these sample locations (specifically, 16-23569, 16-23655, 16-23657, 16-23693, 16-23749, and 16-23751), the values detected are low and additional sampling is not warranted.

13. Section B-8.3-2 Organic Chemicals, pgs. B-30-B-31:

NMED Comment: The Permittees state that the detected concentrations of VOCs in pore gas at SWMU 16-003(o) were at low levels and that further sampling for extent is not warranted. Also, the Permittees state that the “concentrations tended to increase with depth and increased from the first round to the second round” in section 7.12 of the Report. The Permittees have proposed an approach and method for evaluation of pore gas data (ER2006-0582/LA-UR-06-4107, June 15, 2006). The Permittees must calculate the concentration for each contaminant detected beyond which the pore gas concentrations must not exceed. The concentrations must be conservatively calculated to prevent partitioning into groundwater that could theoretically result in concentrations above the tap water soil screening level (as outlined in the *Technical Background Document for Development of Soil Screening Levels, Revision 4.0, NMED 2006*).

During the second round of pore gas sampling in borehole 16-23691, the 175-176 foot interval

contained higher concentrations of acetone (285 $\mu\text{g}/\text{m}^3$), 2-butanone (76.6 $\mu\text{g}/\text{m}^3$), and toluene (339 $\mu\text{g}/\text{m}^3$) compared to the first round. The Permittees must perform an additional round of sampling to determine if the concentrations are increasing with time. NMED may require additional boreholes depending on the results of monitoring data.

Because of the lateral extent of contamination and the increasing contaminant concentrations with depth along the former drainline from building 340, the Permittees must also determine if there are VOCs in pore gas in this area. Specifically, a deep boring (total depth to be determined based on field screening) must be located near sampling locations 16-24894, 16-26896, 16-24899, and 16-24891. The Permittees must follow the pore-gas sampling procedures as described in the approved work plan.

14. Section B-8.4-2 Organic Chemicals, pg. B-34, first paragraph:

Permittees' Statement: "[Acetone] was also detected in fill, sediment, and the underlying tuff near the locations of the former drainline and terminus (16-23710, 16-23722, 16-23713, 16-23712, and 16-23720)."

NMED Comment: Acetone is not shown as being detected at locations 16-23713 or 16-23712 on either the figures or the tables. The Permittees must clarify this statement.

15. Appendix C Field Methods

NMED Comment: The Permittees provide a general description of the use of a photoionization detector for screening VOCs. The Permittees must provide information on the voltage of the lamp used during the field activities.

16. Appendix D Borehole Logs and Well Construction Methods

NMED Comment: The Permittees do not identify any surge beds during drilling for this site investigation. Given how important surge beds are at TA-16 for contaminant migration, NMED requests the Permittees relog the core and identify changes in permeability and/or the presence of surge beds.

17. Appendix E Analytical Program

NMED Comment: The Permittees state that "[s]ome of the analytical results were rejected for various reasons and are not usable for the purposes of this report." According to Section XI.C.14.c of the Consent Order, the Permittees must provide a summary of data quality exceptions and their effect on the acceptability of the analytical data. The reasons the data were rejected are discussed in general terms throughout the appendix, but do not provide sufficient information for determining data acceptability for each sample. The rejected data listed below for SWMU 16-003(o) are presented on Table F-2.0-5. The Permittees must resample at these

locations.

- At sampling locations 16-23636, 16-23637, 16-23638 and 16-23639 (which are all located downgradient of structure 16-811), nitrate data were rejected at all sample intervals. Several samples upgradient from these have detected concentrations of nitrate.
- At sampling locations 16-23609, 16-24894, 16-24896, 16-24899, and 16-24891, the HE data were rejected for all sample intervals. These sampling locations are located along a former drainline where data show increasing concentrations of SVOCs with depth (see specific comment #10). The Permittees must determine extent of explosives compound contamination if detected.
- At sampling locations 16-23671, 16-23674, 16-23676, 16-23678, 16-23677, 16-23678, 16-23681, 16-23682, 16-23683, 16-23684, chromium data were rejected. Most of the reported data far exceed the background values of 19.3 ppm for soil and 7.14 ppm for QBt 2,3,4. All of these sampling locations are located in the upper part of the former fishladder structure where contaminated soil/tuff has already been removed.

18. Section H-4.0 Ecological Screening Assessment:

NMED Comment: The conclusions drawn by the ecological risk screening relied significantly upon the use of background and receptor species area use factors. The use of the background comparison is supported and suitably addresses a number of the constituents of potential ecological concern (COPEC) issues. The application of area use factors, however, is an uncertain tool with tenuous results. The spatial distribution of COPEC occurrence within and outside of viable habitat (i.e., the tuff) must be used as a line of evidence for the revised risk assessment. The results of the retained COPECs should be depicted within the Habitat Map (Figure H-1) in order to provide a context on the exposure, and potential risk setting.

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

Sincerely,



James Bearzi
Chief
Hazardous Waste Bureau

Messrs. Gregory and McIntire
September 14, 2006
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JPB:dxg

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