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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 2, 2010

Mr. George Rael, Environmental Projects
Office, Federal Project Director
U.S. Department of Energy/National Nuclear
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Los Alamos Site Office
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Mr. Michael Graham, Associate Director
Environmental Safety, Health and Quality
Los Alamos National Security, L.L.C.
P.O. Box 1663, MS K491
Los Alamos, NM 87545

**RE: NOTICE OF DISAPPROVAL
INVESTIGATION REPORT FOR SITES AT TECHNICAL AREA 49
INSIDE THE NUCLEAR ENVIRONMENTAL SITE BOUNDARY
LOS ALAMOS NATIONAL LABORATORY (LANL),
EPA ID #NM0890010515
HWB-LANL-10-042**

Dear Messrs. Rael and Graham:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security, L.L.C.'s (collectively, the Permittees) *Investigation Report for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary* (Report), dated May 2010 and referenced by LA-UR-10-3304/EP2010-0133. NMED has reviewed the Report and hereby issues this Notice of Disapproval (NOD).

General Comments:

- 1) Overall, the statistical analysis and scatter plots discussed in Sections 4.1 and 4.2 and presented in Appendices H and I are technically adequate. However, reliance solely on these methods to determine constituents of potential concern (COPCs) for both nature



and extent of contamination and for risk assessment purposes may result in unacceptable uncertainties. A primary concern is that uncertainty in background may be used as a line of evidence to dismiss inorganics that may drive risk (human health, ecological, or both), which is not acceptable. If the use of the background reference values for soil and Qbt 2,3,4 are not appropriate, additional Qbt 4 background samples must be collected and an appropriate background data set must be established for Qbt4 for use at TA-49.

- 2) There are several sample locations on Plate 2 (*Area 1 [SWMU 49-001(a)] inorganic chemical concentrations detected above background values*) that have no sample IDs. NMED acknowledges that these locations had no detections above background (for inorganics) and that Plate 1 provides the sample IDs for all sampling locations at Area 1. However, it facilitates NMED's review if all sample IDs are identified on the same Figure or Map. The Permittees must revise all applicable Plates to include *all* sample location IDs. This revision renders Plates 1, 5, 8, 12, 16, 20, 24, and 28 unnecessary; they must therefore be removed from the Report.
- 3) Throughout the Report, the Permittees state that detection limits (DL) were greater than the soil/tuff background value (BV) for inorganic constituents. The Permittees must explain why the DLs were greater than the BVs for inorganic constituents and revise the conclusions accordingly.
- 4) NMED acknowledges that the Plates in the Report only depict concentrations of inorganics and radionuclides above background values (BV). In many cases the deepest sampling interval does not appear on the Plate because there were no detections above BV for inorganics or radionuclides and no detections for organics. However, there is no way to know that a sample was collected from a deeper interval without consulting the approved Work Plan or the "All-Analyses" tables. Without this knowledge, it would appear that the Permittees have not defined the vertical extent of several constituents. To facilitate NMED's review of the Report, the Permittees must revise the Plates to include the TD of each sampling location.

Specific Comments:

1) Section 2.2, Deviations, page 9, paragraph 2:

Permittees' Statement: "Four samples from two locations within Area 2B [SWMU 49-001(d)] were not collected because of the presence of a wire-mesh biointrusion barrier that covers the surface."

NMED Comment: The Permittees must identify the two proposed sample locations from the approved Work Plan that were not sampled because of the wire-mesh biointrusion barrier.

2) Section 4.0, Statistical Methods Overview, pages 12-15:

NMED Comment: See General Comment # 1.

3) Section 6.2.3.3, Soil and Rock Sample Analytical Results, Inorganic Chemicals in Tuff, page 25:

Permittees' Statement: "Table 6.2-4 presents the concentrations of inorganic chemicals detected above BVs, detected with no available BV, or with DLs above BV."

NMED Comment: The Permittees must explain why the detection limits for several metals (e.g., aluminum, barium, chromium) are higher than the background value (BV) for each of these metals.

4) Section 7.6.4, Nature and Extent of Soil and Rock Contamination, Radionuclides, page 44, paragraph 2:

a) Permittees' Statement: "Cesium-137 was detected above FV [fallout value] (1.65 pCi/g) in three soil samples at site locations 49-610133, 49-610134, and 49-610151. Cesium-137 was not detected in samples from the overland corridors."

NMED Comment: Contrary to the Permittees' above statement, Cesium-137 was detected in samples from the overland corridors. Specifically, samples 49-610013, 49-610129, and 49-610046. The Permittees must revise the text to resolve this discrepancy.

b) Permittees' Statement: "Plutonium-238 was not detected in samples collected from the overland corridors."

NMED Comment: Contrary to the Permittees' above statement, Plutonium-238 was detected in a sample obtained from the overland corridors (sample 49-610038). The Permittees must revise the text to resolve this discrepancy.

c) Permittees' Statement: "Plutonium-238/239 concentrations decreased to the west, south, and east of location 49-610151."

NMED Comment: The sentence should read "Plutonium-239/240 concentrations decreased to the west, south, and east of location 49-610151." The Permittees must revise the text to correct the typographical error.

5) Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 51, paragraphs 2-3:

Permittees' Statement: "The following inorganic chemicals (antimony, barium, beryllium, calcium, chromium, cobalt, copper, cyanide, iron, lead, magnesium, manganese, mercury, nickel,

perchlorate, thallium, selenium, total uranium, and vanadium) were detected in soil and/or tuff above BVs, detected with no BV, or with DLs above BVs and statistical tests indicate that the detected concentrations are different from background.”

NMED Comment: The Permittees state later in the same section that “[a]t SWMU 49-001(e), the concentrations of several inorganic chemicals in tuff, including aluminum, manganese, nickel, and selenium are above the corresponding Laboratory-wide inorganic chemical background dataset for tuff (or are higher than the maximum concentrations in the background datasets), but are consistent with the TA-49 inorganic chemical background dataset for Qbt4.” The two statements appear to contradict one another. The Permittees must provide additional clarification as to whether or not the concentrations of inorganics are consistent with background.

6) Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 52, paragraph 3:

Permittees’ Statement: “The vertical extent of beryllium in site samples is defined by perimeter boreholes 49-609981, 49-609982, 49-609983, and 49-609983 where beryllium decreased with depth or was not detected above BV.”

NMED Comment: The Permittees must revise the above sentence to correct the typographical error. The sentence should read, “[t]he vertical extent of beryllium in site samples is defined by perimeter boreholes 49-609981, 49-609982, 49-609983, and **49-609984** where beryllium decreased with depth or was not detected above BV.”

7) Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 53, paragraph 2:

Permittees’ Statement: “Cobalt concentrations were essentially the same, and did not change laterally or with depth in samples collected from corridor locations. The lateral and vertical extent of cobalt are defined.”

NMED Comment: Cobalt was detected above the residential regional screening level (RSL) (23 mg/kg) in the deepest sampling interval at corridor sample location 49-610005 (0.5 to 1.5-feet). Therefore, vertical extent is not defined for cobalt at sample location 49-610005. Additionally, cobalt was detected above the residential RSL at location 49-610007 at a depth of 0-0.5-feet. The Permittees may address the elevated levels of cobalt as part of the Phase II investigation or the corrective measures evaluation (CME) Report.

8) Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 53, paragraph 5:

Permittees’ Statement: “Iron concentrations exceeded the maximum background (19,500 mg/kg) at two site locations (49-609308 and 49-609313) and one corridor location (49-610017), with a maximum detected concentration of 23,500 mg/kg at location 49-609308.”

NMED Comment: The Permittees must specify which background dataset (soil or tuff) they are referring to in their explanations of nature and extent of contamination. One could interpret the above statement to be a comparison to either the maximum soil or maximum tuff background concentration. Depending on the dataset used for comparison, there would be several other detections at SWMU 49-001(e) that exceeded the maximum background concentration for iron. The Permittees must revise the text, where appropriate, to clarify the specific dataset being used for comparison.

9) Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Radionuclides, page 56:

Permittees' Statement: "Cesium-137 was detected above the FV (1.65 pCi/g) in one tuff sample and three soil/fill samples at site locations 49-609324, 49-609328, 49-609330, and corridor location 49-610013."

NMED Comment: The Permittees state in the second sentence of the same paragraph that "[t]he maximum detected concentration (0.214 pCi/g) was in the deeper sample at site location 49-610013. If the maximum detected concentration was 0.214 pCi/g, no samples exceeded the FV of 1.65 pCi/g for Cesium-137. Furthermore, the FV (1.65 pCi/g) only applies to the 0-6-inch sampling interval. The aforementioned detections were all obtained from the 0.5-1.5-foot depth interval. The Permittees must revise the text to resolve this discrepancy.

10) Section 9.2.3.4, Nature and Extent of Soil and Rock Contamination, Radionuclides, page 65, paragraph 3:

Permittees' Statement: "Cesium-137 was detected above the FV (1.65 pCi/g) in two soil samples at corridor locations 49-610039 and 49-610046, with a maximum detected concentration of 0.257 pCi/g at corridor location 49-610046."

NMED Comment: The Permittees state that the maximum detected concentration of Cesium-137 was 0.257 pCi/g. If the maximum concentration was 0.257 pCi/g, no samples exceeded the Cesium-137 FV of 1.65 pCi/g. The Permittees must revise the text to resolve the discrepancy.

11) Section 10.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 73, paragraph 8:

Permittees' Statement: "Selenium was detected above the soil BV (1.52 mg/kg) in three samples, with a maximum detected concentration of 1.8 mg/kg at borehole location 49-610500. Additionally, one sample had a DL (2 mg/kg) above the soil BV."

NMED Comment: According to Plate 21, there are several more detections of selenium than identified by the Permittees. NMED acknowledges that the detections are J-flagged, but they are nevertheless detections above BV. For example, selenium was detected at location 49-610494 at

the 8-10-foot depth interval at a concentration on 2.5 mg/kg. The Permittees must revise the text to resolve this discrepancy.

12) Section 10.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 73, paragraph 9:

Permittees' Statement: "Total uranium was detected above the soil BV (1.82 mg/kg) in two samples with a maximum detected concentration of 2.42 mg/kg at location 49-08029."

NMED Comment: Contrary to the Permittees statement above, the maximum detected concentration of total uranium in soil was at location 49-08033 (3.63 mg/kg); not location 49-08029. Moreover, three other locations (49-08028, 49-08040, and 49-08034) at Area 11 had higher detected concentrations of total uranium than location 49-08029. The Permittees must revise the text to resolve this discrepancy.

13) Section 10.2.3.4, Nature and Extent of Soil and Rock Contamination, Radionuclides, page 74, paragraph 4:

Permittees' Statement: "Plutonium-238 was detected above FV (0.023 pCi/g) or at depths where the FV does not apply in eight soil and tuff samples, with a maximum detected concentration of 0.088 pCi/g at boreholes location 49-610496."

NMED Comment: According to Plate 23 (Area 11 [AOC 49-008(c) and SWMU 49-003] radionuclides detected above background or fallout values), sample location 49-08040 had the maximum detected concentration of Plutonium-238 (1.1 pCi/g), not sample location 49-610496. The Permittees must revise the text to resolve this discrepancy.

14) Section 10.2.3.4, Nature and Extent of Soil and Rock Contamination, Radionuclides, page 75, paragraph 1:

Permittees' Statement: "Plutonium-239/240 was detected above FV (0.054 pCi/g) or at depths where FV does not apply in 10 soil and tuff samples with a maximum detected activity [concentration] of 4.87 pCi/g at location 49-610496."

NMED Comment: According to Plate 23 (Area 11 [AOC 49-008(c) and SWMU 49-003] radionuclides detected above background or fallout values), sample location 49-08040 had the maximum detected concentration of Plutonium-239/240 (66.1 pCi/g), not sample location 49-610496. Furthermore, this concentration exceeds both the residential and construction worker screening action levels (SALs). The Permittees must revise the text to resolve this discrepancy. The Permittees may address the elevated levels of plutonium-239/240 as part of the Phase II investigation or the corrective measures evaluation (CME) Report.

15) Section 10.3.3.1, Site Contamination, Soil and Rock Sampling, page 76, paragraph 1:

Permittees' Statement: Samples were collected using a drill rig equipped with a continuous core-barrel sampling system. Investigation of AOC 49-008(c) is deferred per Table IV-2 of the Consent Order (Table 1.1-1). Therefore, surface samples were not collected for SWMU 49-003 during the 2009-2010 investigation."

NMED Comment: NMED assumes the second sentence is a typographical error because SWMU 49-003 is *non-deferred* (see Table IV-1 of the March 1, 2005 Order on Consent (Order)). The Permittees must revise the text to correct the typographical error.

16) Section 11.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 88, paragraph 6:

Permittees' Statement: "Barium was detected above the soil BV (295 mg/kg) in three samples. The maximum detected concentration of 539 mg/kg was at location 49-609907 in a sample collected from 0.5 to 1.5 ft bgs...barium in tuff is not different from background."

NMED Comment: The Permittees must clarify whether or not the concentrations of barium in soil or tuff are statistically similar to background. It is unclear from the above statement which dataset is being used for comparison. Furthermore, according to Plate 21, barium was only detected in soil (ALLH). The Permittees must revise the text to resolve this discrepancy.

17) Section 12.3.4, Nature and Extent of Sediment Contamination, Radionuclides, page 98, paragraph 4:

Permittees' Statement: "Plutonium-239-240 was detected in sediment at eight sampling locations in Water Canyon. Concentrations ranged from 0.69 to 8.08 pCi/g, with the maximum detected concentration at sampling location 49-610349. Sampling location 49-610349 is downstream of TA-49 activities, but concentrations were not detected in the deeper sample along the transect. Samples were not collected downgradient of location 49-610349"

NMED Comment: The maximum concentration of plutonium-239/240 was detected in the furthest downstream sample collected in Water Canyon. The Permittees must therefore provide additional justification for not sampling downgradient of location 49-610349 or propose additional sampling in the Phase II Investigation Work Plan.

18) Section 15.0, Schedule for Recommended Activities, page 101:

NMED Comment: NMED will establish a due date for the Phase II Investigation Work Plan in its approval of the Report.

19) Table 7.4-6, Summary of Radionuclides Detected or Detected above BVs/FVs at MDA AB, page 167:

NMED Comment: The Permittees must revise the Table to include the Soil BV for Cesium-137.

The Permittees must address all comments in this letter in a revised Report. The Permittees must submit the response to this NOD and the revised Report to NMED no later than **September 3, 2010**. All submittals (including maps) must be in the form of two paper copies and one electronic copy in accordance with Section XI.A of the Order. In addition, the Permittees shall submit a redline-strikeout version that includes all changes and edits to the Plan (electronic copy) with the response to this NOD.

Please contact Kathryn Roberts at (505) 476-6041 should you have any questions.

Sincerely,



James P. Bearzi
Chief
Hazardous Waste Bureau

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File: '10 LANL, TA-49 (SWMUs: 49-001(a), MDA AB (49-001(b), 49-001(c), 49-001(d), 49-001(g)), 49-001(e), 49-001(f), 49-003, and 49-008(c); AOC 49-008(d))