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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 18, 2011

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Michael J. Graham, Associate Director  
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Los Alamos National Security, L.L.C.  
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Los Alamos, NM 87545

**RE: DIRECTION TO MODIFY  
UPPER WATER CANYON AGGREGATE AREA  
INVESTIGATION WORK PLAN, REVISION 1  
LOS ALAMOS NATIONAL LABORATORY  
EPA ID #NM0890010515  
HWB-LANL-10-070**

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 (LANS) (collectively, the Permittees) *Investigation Work Plan for Upper Water Canyon Aggregate Area, Revision 1* (Plan), dated January 2011, received January 14, 2011, and referenced by LA-UR-11-0135 / EP2010-0516.

NMED has reviewed the Plan and hereby issues this Direction to Modify in accordance with Section III.M.2 of the March 1, 2005 Compliance Order on Consent (Consent

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Order). These Modifications are necessary because the Permittees have not responded to several of the more significant comments in NMED's October 26, 2010 Notice of Disapproval (2010 NOD).

The Modifications to the Plan are as follows:

**1. NMED General Comment 3, in the 2010 NOD; Sites Where Buildings, Magazines or Other Structures Were Destroyed by Intentional Burning:**

The Permittees' have responded to the comment by indicating that, "There is no reason to suspect these wood-framed structures contained any chlorine source that would, in turn, contribute to the formation of dioxins and furans when the structures were burned. Structures burned as part of the demolition and decontamination efforts are not a potential source of these contaminants."

The burning of wood is a significant source of dioxin-like compounds (i.e., dioxins, furans, and polychlorinated biphenyls) in the United States. According to the United States Environmental Protection Agency's (USEPA) 2006 document, *An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000*, the combustion of wood in industrial facilities was ranked the seventh highest major source of dioxin-like compounds in the year 2000. Releases of dioxin-like compounds from residential wood combustion were also measured based on empirical data from several different studies on the burning of various types of wood in residential fireplaces.

Another published study (1984) conducted by Pettersen, *The Chemical Composition of Wood*, found that chlorine is present at various concentrations in different species of wood, thus potentially facilitating the chlorination that can lead to the formation of dioxins and furans during wood combustion processes.

Both references are available by request.

Although several LANL investigation work plans (IWPs) were approved by NMED for aggregate areas where wooden structures were destroyed by burning, and analyses for dioxins and furans were not required, it has come to the attention of NMED that the lack of data on the concentrations of dioxins and furans constitutes a data gap in site characterization and in risk assessments. Work plan modifications are required to include the analysis of dioxins and furans at sites where the burning of wooden structures was conducted, as well as the burning of plastics and other building materials and the combustion of waste in general.

As also stated in the 2010 NOD, the Plan must be modified as follows:

At any Area of Concern (AOC), Solid Waste Management Unit (SWMU), or Consolidated Unit (CU) where structural demolition by burning was conducted, soil samples must be collected and analyzed for dioxin/furan congeners. Due to the relative low mobility of these compounds in soil, NMED will accept sampling for individual AOCs, SWMUs and CUs which target the upper sample interval(s) at locations slated for sample collection at multiple depths. When determining sample locations for these analytes, the Permittees must consider past and current site drainage patterns. Sample locations for these analytes must target areas most likely to have served as drainage pathways and areas of sediment accumulation. This modification applies to structures in both Technical Area 11 (TA-11) and TA-16 and affects approximately 36 AOCs, SWMUs, or CUs. Note that because former outfall SWMU 16-029(r) served high explosives (HE) process building 16-25 which was destroyed by intentional burning, dioxin/furan congeners must also be included in the analytical suites for that SWMU.

The results of dioxin/furan soil sample analyses must be presented in the Upper Water Canyon Aggregate Area Investigation Report (IR).

## **2. NMED General Comment 4, 2010 NOD, Groundwater Monitoring :**

The Permittees have responded to the comment by indicating that, "Installation of a new intermediate and regional well as requested in NMED's comment is premature."

The potential exists for groundwater contamination from contaminant sources at the Upper Water Canyon Aggregate Area. As noted in the Plan, diverse contaminant releases to the environment were prevalent from 1944 to the 1990s. Of the 166 SWMUs, AOCs, and CUs, 41 sites have a history of liquid releases from outfalls and 12 sites contain septic systems. The types, concentrations, and inventories of contaminants released from these outfalls and septic systems prior to permitting through the National Pollutant Discharge Elimination System (NPDES) are not known. Liquid releases at these sites, coupled with contributions from natural precipitation, infiltration, and recharge in the area may be significant and suggest that contaminant transport of soluble compounds from the AOCs, SWMUs, and CUs to areas where persistent surface water, alluvial groundwater, or both, are present.

Given the number of sites, a cumulative effect for contaminant transport must also be considered. Using present-day contaminant distribution and inventory data for these sites to make assumptions as to whether or not there is a potential for groundwater contamination, can be misleading, or false. The more soluble contaminants at the sites may have re-mobilized in the downstream direction, and contaminants originally deposited may no longer be present at or near the surface of the sites. In addition, the complexity of the hydrogeologic system and associated contaminant pathways beneath

and downgradient of the area adds even more uncertainty to the assessment of groundwater contamination. As indicated in NMED's letter "Well Evaluation and Network Recommendations Study, Technical Area 16 and Upper Water Canyon Watershed", dated January 31, 2011, the Permittees must evaluate the current groundwater monitoring network at TA-16 (including the Area) and make recommendations for additional intermediate and regional aquifer wells, if needed. The evaluation and recommendation report discussed in that letter is due no later than July 1, 2011.

This Modification does not add any additional requirements with respect to groundwater that were not in NMED's January 31, 2011 letter.

**3. NMED Specific Comment 16, 2010 NOD, Section 5.26.3, Scope of Activities for AOC 16-022(a), page 45:**

The Permittees were directed in the 2010 NOD to revise the Plan and propose a suitable number of appropriately placed soil borings including sample collection and analyses of appropriate sample intervals to document and evaluate site conditions using decision-level laboratory data that can be used for risk assessment purposes.

The Permittees have not proposed any additional investigation at this AOC in the Plan. The Permittees refer to a Section of the Plan that does not exist (5.2.6.1), and assert that a 1994 letter from the NMED Petroleum Storage Tank Bureau (PSTB) indicates no further action at the underground storage tank (UST) was necessary. The non-decision level analytical data collected in 1993 and 1994 have not been provided to NMED's Hazardous Waste Bureau (HWB) nor have the Permittees provided a copy of NMED's 1994 letter.

The Permittees are reminded that the second paragraph of Section XI.B.5 of the Consent Order describes the types of required information that are needed with respect to discussions of previous site investigations. None of that information has been provided to NMED for this AOC and the information is not in HWB's record. *See also, Section III.M.1 (Submittal of Work Plans) of the Consent Order.*

The Permittees must provide decision-level analytical data that defines the nature and extent of contamination at the AOC, or provide a copy of a letter from the PSTB indicating no further corrective action is necessary. Until then, it will not be possible for NMED to make a Corrective Action Complete determination for the AOC.

Alternatively, the Permittees are directed to obtain a minimum of 16 subsurface samples from four locations; one within and three around the footprint of the former UST (Plan,

Figure 5.27-3). Samples must be collected from four depths (4–5 ft, 9–10 ft, 14–15 ft, and 24–25 ft below ground surface (bgs) at each location. In the event petroleum contamination is present in any boring at 25 feet bgs, the boring must be extended until evidence of contamination is no longer present. All samples must be analyzed for Target Analyte List (TAL) metals, Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO), and TPH-Gasoline Range Organics (GRO).

**4. NMED Specific Comment 17, 2010 NOD, Section 5.27.3, Scope of Activities for AOC 16-022(b), page 46:**

Figure 5.27-3 indicates samples will be collected at a total of nine locations in and around USTs 16-196 (AOC 16-033(b)) and 16-197 (AOC 16-022(b)). The Permittees must advance any of the nine soil borings if evidence of contamination at 25 feet bgs is present. The boring must be advanced until evidence of contamination is no longer present. This is necessary because benzene, toluene, ethyl benzene and xylenes (BTEX) were present at 65 feet bgs in samples collected in 1994.

**5. NMED Specific Comments 42, 43, 47, and 49, 2010 NOD, AOCs 16-033(b), 16-033(k), C-16-031, and C-16-073:**

At any boring location where field screening evidence of contamination is present in the deepest proposed sample interval, the boring must be extended to depths where such evidence is not present in accordance with Section IX.B.2.b.i (*Drilling*) of the Consent Order.

**6. AOCs, SWMUs or CUs Where Alluvial/Tuff Interfaces are Encountered During Subsurface Sampling:**

At any boring location where a soil and tuff interface is encountered, collect a sample at the contact or first encounter with geologic units of different lithology, structural or textural characteristics, or of relatively higher or lower permeability in accordance with Section IX.B.2.b.i (*Drilling*) of the Consent Order.

**7. Section 6.1, Establish Sampling Locations, pages 119 and 120:**

The Permittees have added a new paragraph to this section as follows: “Some of the planned sampling locations are in the vicinity of active buildings with attendant utility connections. After the desired locations are established, it may not be possible to obtain permission to collect samples or otherwise complete the site investigation. These cases will be documented as “deviations” in the investigation report.”

Any such deviations must be justified with technical or safety reasons.

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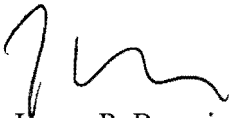
Until the nature and extent of contamination at the AOCs and SWMUs has been defined for the entire AOC or SWMU, it will not be possible for NMED to make Corrective Action Complete determinations for the AOCs or SWMUs.

All other elements of the Plan are approved. Modifications presented in this letter must be executed as provided in Section III.M.2 of the Consent Order.

The Upper Water Canyon Aggregate Area Investigation Report is due no later than **December 31, 2012**.

Please contact Daniel Comeau at (505) 476-6043, if you have any questions.

Sincerely,



James P. Bearzi  
Chief  
Hazardous Waste Bureau

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