



TA 21



Associate Director for  
Environmental Programs  
P.O. Box 1663, MS M991  
Los Alamos, New Mexico 87545  
(505) 606-2337/Fax (505) 665-1812

Date: August 19, 2008  
Refer To: EP2008-0410

James P. Bearzi  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505-6303

**Subject: Submittal of the Response to the "Approval with Modifications for the Phase II Investigation Report for Material Disposal Area T at Technical Area 21, November 2007"**

Dear Mr. Bearzi:

Enclosed please find two hard copies with electronic files of the response to the "Approval with Modifications for the Phase II Investigation Report for Material Disposal Area T at Technical Area 21."

We are responding to the Approval with Modifications because we are recommending an alternate plan that includes one deep, permanent vapor monitoring well instead of two shallow monitoring wells. We believe the deeper well is technically feasible and will provide additional information needed to support any decisions regarding a corrective measures report for MDA T.

If you have any questions or concerns regarding the enclosed information, please contact Bruce Wedgeworth at (505) 231-0108 ([brucew@lanl.gov](mailto:brucew@lanl.gov)) or George Henckel at (505) 606-0960 ([GHenckel@doeal.gov](mailto:GHenckel@doeal.gov))

Sincerely,

  
Susan G. Stiger, Associate Director  
Environmental Programs  
Los Alamos National Laboratory

Sincerely,

  
David R. Gregory, Project Director  
Department of Energy  
Los Alamos Site Office



SS/AC/BW;jk

Enclosure: Two hard copies with electronic files:

- 1) Response to the Approval with Modifications for the Phase II Investigation Report for Material Disposal Area T (EP2008-XXXX)

Cy: (w/enc.)  
Bruce Wedgeworth, EP-TA-21, MS C349  
George Henckel, DOE-LASO, MS A316  
RPF, MS M707 (with two CDs)  
Public Reading Room, MS M992

Cy: (Letter and CD only)  
Laurie King, EPA Region 6, Dallas, TX  
Steve Yanicak, NMED-OB, White Rock, NM  
Kevin Reid, Terranear-PMC  
Kristine Smeltz, WES-DO, MS M992  
Peggy Reneau, EP-WES, MS M992  
EP-TA-21 File, MS C349

Cy: (w/o enc.)  
Tom Skibitski, NMED-OB, Santa Fe, NM  
Alison Bennett, DOE-LASO (date-stamped letter emailed)  
Allan Chaloupka, EP-TA-21, MS C349  
Bill Criswell, EP-TA-21, MS C349  
Susan G. Stiger, ADEP, MS M991  
Carolyn A. Mangeng, ADEP, MS M991  
Alison M. Dorries, WES-DO, MS M992  
IRM-RMMSO, MS A150 (date-stamped letter emailed)

**Response to the "Approval with Modifications, Phase II Investigation Report,  
Material Disposal Area (MDA) T at Technical Area (TA) 21, Revision 1.0,  
EPA ID No: NM0890010515, HWB-LANL-08-005,"  
Dated March 28, 2008**

**INTRODUCTION**

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment. This response contains data on radioactive materials, including source, special nuclear, and byproduct material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy (DOE) policy.

**SPECIFIC COMMENTS**

**NMED Comment #3**

*The Permittees failed to provide in the revised Report documentation (e.g., a Document Safety Analysis or an equivalent reference) to explain how and why the status of the work area at MDA-T changed from designation as a nuclear environmental site to a nuclear facility. NMED explicitly stated in the February 22, 2008 meeting with LANS contractor Kevin Reid and Bruce Wedgeworth of your staff that specific documentation must be submitted to explain the new designation and to justify the Permittees need to install substitute investigation boreholes 21-603058 and 21-603059. Since the Permittees did not adequately justify the need for the deviation, the Permittees must collect pore-gas samples from all five borehole locations (21-25262, 21-25263, 21-25264, 21-603058, and 21-603059) for the remainder of the quarterly sampling events. This must include the removal of the slough from boreholes 21-25262 and 21-25263, as originally required by NMED in the February 2007 Phase II Investigation Work Plan for MDA-T (referenced by LA-UR-07-0930/EP2007-0105), and the installation of permanent vapor monitoring wells equivalent to those installed in borings 21-25264, 21-603508, and 21-603059.*

*NMED acknowledges that the Permittees will have to submit a Safety Basis report for the required work. In order to provide for enough time for this process, NMED will allow the Permittees to deviate from the original monitoring requirements included in the October 2007 Subsurface Vapor-Monitoring Plan for MDA-T at TA-21 (LA-UR-07-7037/EP2007-0658) which states "Samples will be collected on a quarterly basis for one year beginning on October 2007" (page 2). Instead of the schedule proposed in the October 2007 Work Plan, the Permittees must conduct quarterly sampling on the following time schedule:*

Quarterly Event	Date
2	June 2008
3	September 2008
4	December 2008

### LANL Response to #3

Material Disposal Area (MDA) T has been a nuclear facility and a nuclear environmental site (NES) since November 2003 (DOE 2003, 087047). The attached figure, **Figure 3.2-1** from the February 2008 Phase II investigation report (IR), revision 1 (LANL 2008, 102182), clearly shows these boundaries. LANL acknowledges that the original figure from the 2006 MDA T IR (LANL 2006, 094151) was unclear regarding the NES and nuclear facility boundaries because the nuclear facility boundary had not been identified. However, NMED's assertion that the status of the work area at MDA T changed its designation from a nuclear environmental site (NES) to a nuclear facility is not correct. There was no change, no deviation, or no new designation for the work area: the boreholes in question (21-25262 and 21-25263) were always within the nuclear facility boundary. Because the boreholes were within the nuclear facility boundary and additional time was needed to prepare for well installation, LANL requested moving each of the boreholes to immediately outside the nuclear facility boundary. (NMED granted the request in a phone call and an e-mail on October 26, 2007.) This request was discussed in detail with NMED during the meeting on February 22, 2008. Specific safety basis documentation can be provided, if needed.

To better define the nature and extent of subsurface contamination at Technical Area 21 (TA-21), LANL plans to conduct a mesa-wide tritium evaluation that will initially focus on the liquid disposal locations (e.g., the absorption beds). The mesa-wide evaluation plan, titled "Technical Area 21 Subsurface Vapor Moisture Monitoring Plan" (LANL 2007, 098944) was submitted to NMED on July 16, 2008. This plan considers the disposal of tritium-contaminated wastewater into the absorption beds at MDA T. Rather than installing two relatively shallow permanent vapor-monitoring wells in the two open boreholes, per NMED's comment, LANL proposes an alternate plan to deepen one of the open boreholes (21-25262) to approximately 690 ft below ground surface (bgs) and to install a permanent vapor-monitoring well with up to nine sampling ports. We recommend deepening only borehole 21-25262 because (1) the vertical extent of contamination must be confirmed; (2) no data from depths below 380 ft are available that can be used to support a corrective measures evaluation (CME), and (3) this borehole is near absorption bed 1, which historically received the most wastewater discharge and, therefore, the most tritium transported in the water. The other open borehole (21-25263) will be plugged and abandoned because the tritium and volatile organic compound (VOC) data from borehole 21-603058 are sufficient to support a CME.

Bedrock pore water sampling and packer-test water-vapor sampling test results will be used to determine the vertical extent of VOC and tritium contamination before the vapor monitoring ports are installed. This determination will be based on either decreasing trends of VOC and tritium values from the shallower samples collected at this borehole or a tritium value of less than 20,000 pCi/L in the deepest sampling location. If deeper ports are required (into the Puye Formation), they will be installed at approximately 100-ft intervals and extended to just above the regional aquifer. The installation of additional ports will probably require a multiwell completion to facilitate construction of the monitoring ports.

Drilling to depths deeper than 400 ft will require the services of an air-rotary rig. Based on the stratigraphy encountered in borehole 21-02523 at MDA V, the estimated total depth for borehole 21-25262 will be approximately 690 ft, if the deepest port is in the Guaje Pumice Bed. Soil vapor samples will be collected on a quarterly basis for 1 yr and analyzed for VOCs and tritium. This additional sampling will assist DOE in characterizing the nature and extent of subsurface tritium at MDA T. The resources required for the higher priority groundwater boreholes have strained drilling resources. This, along with the time needed to address safety basis issues, constrained LANL's ability to meet the schedule date of June 2008 for the second quarterly sampling event. LANL will propose a revised schedule once the drilling services for the higher priority groundwater boreholes are awarded.

#### **NMED Comment #5**

*NMED disagrees with the Permittees assertion that comparing data collected from borehole 21-25262 in 2006 to data collected from Ports #1 and #3 of borehole 21-603059 (replacement borehole for 21-25262) in 2007 is sufficient in determining trends related to changes in concentrations without information from Port #2. The differences in concentrations are too variable for trends to be determined based on such minimal information. For example, tritium was detected at Port #1 in January 2006 at a concentration of 6,680  $\mu\text{g}/\text{m}^3$ , in April 2006 at 2,090  $\mu\text{g}/\text{m}^3$ , and in October 2007 it was not detected. At Port #3 similar variances in the results occur; January 2006 tritium levels were detected at 9,670  $\mu\text{g}/\text{m}^3$ , in April 2006 at 2,190  $\mu\text{g}/\text{m}^3$ , and in October 2007 levels were detected at 379.253  $\mu\text{g}/\text{m}^3$  (see Table 6.5-2 in Investigation Report for MDA-T Consolidated unit 21-016(a)-99 (LA-UR-06-6506/EP2006-0779) and Table 3.4-3 in the Report).*

*The Permittees did not generate boring logs for the two replacement boreholes (21-603058 and 21-603059) due to the assumption that locations 30 to 40 feet away from the original locations would not result in lithological differences that would affect sample collection; however, there appears to be variation in the porosity of the tuff which significantly affected the Permittees' ability to collect pore-gas samples at comparable depths. The Permittees must collect samples from Port #2 in the original borehole (21-25262) for the final three quarters since collection of samples from Port #2 in borehole 21-603059 is not possible (see comment #3 above).*

#### **LANL Response to #5**

As previously discussed with NMED, port #2 in borehole 21-603059 is no longer functional and cannot be repaired without destroying the current permanent well installation. Attempts to rehabilitate the port, described in the revised Phase II IR for MDA T (LANL 2008, 102182) were unsuccessful. During the installation of the proposed deep borehole (21-25262), discussed above in the response Comment 3, one of the ports will be placed at the same elevation (approximately 115 ft bgs) as the nonfunctioning port #2 in borehole 21-603059. The new port will then be sampled for VOCs and tritium.

#### **NMED Comment #8**

*The Permittees did not provide in the revised Report the required additional evidence for determining that the detected pore-gas concentrations are not a potential source for exposure via inhalation as required by NMED's Notice of Disapproval for the Phase II IR for MDA-T at TA-21, November 2007 (February 29, 2008). Instead, the Permittees made a comparison to the situation at MDA-L. MDA-L is not comparable to MDA-T. MDA-L is undergoing closure of a cover. The Permittees have not proposed any of these activities at MDA-T. The Permittees must provide a vapor intrusion assessment within 90 days of the final quarterly sampling event and must submit it to NMED as a separate document. This assessment will be used as part of the evaluation to determine whether a Corrective Measures Evaluation (CME) for MDA-T will be required.*

#### **LANL Response to #8**

LANL has evaluated the potential for exposure of indoor industrial workers via inhalation of soil vapors through comparison of VOC concentrations in soil to soil screening levels (SSLs). As noted in the February 8, 2008, notice of disapproval, NMED's SSLs for industrial workers do not include an evaluation of VOC migration into indoor air. U.S. Environmental Protection Agency (EPA) Region 6, however, does have human health medium-specific screening levels (HHMSSLs) for indoor industrial workers that includes a pathway for inhalation of VOCs volatilized from soil (available at [http://www.epa.gov/region6/6pd/rcra\\_c/pd-n/screenvalues.pdf](http://www.epa.gov/region6/6pd/rcra_c/pd-n/screenvalues.pdf)). Because VOCs in pore gas are in equilibrium with liquid- and solid-phase VOCs in

soil, comparison of bulk VOC concentrations in soil to these HHMSSLs would be appropriate to evaluate exposure to VOCs in pore gas. As an initial worst-case screening, maximum concentrations of VOCs detected in soil and tuff during the MDA T investigation were compared to the EPA Region 6 HHMSSLs for indoor industrial workers. This comparison is presented below and shows that all maximum soil concentrations are substantially less than the HHMSSLs.

Analytes	Maximum Concentration Detected at MDA T (mg/kg)	EPA Region 6 HHMSSL for Indoor Industrial Worker (mg/kg)
Acetone	0.159	54000
Benzene	0.00753	15
2-Butanone	0.014	34000
Carbon Disulfide	0.00231	na*
Chloroform	0.000489	5.2
1,2-Dibromo-3-chloropropane	0.002	0.18
1,2-Dichlorobenzene	0.000271	370
1,3-Dichlorobenzene	0.000235	130
2-Hexanone	0.043	na
4-Isopropyltoluene	0.012	na
4-Methyl-2-pentanone	0.00179	17000
Methylene chloride	0.00846	210
Tetrachloroethene	0.028	18
Toluene	0.14	520
Trichloroethene	0.01	0.92
Trichlorofluoromethane	0.002	1300
1,3-Xylene + 1,4-Xylene	0.00043	na

\*na = Not available.

## REFERENCES

- DOE (U.S. Department of Energy), November 26, 2003. "New Categorization of Existing Nuclear Facilities at LANL," U.S. Department of Energy memorandum to J. Holt (Associate Laboratory Director of Operations/Los Alamos National Laboratory) from C.M. Steele (Senior Authorization Basis Manager/DOE-LASO), Los Alamos, New Mexico. (DOE 2003, 087047)
- LANL (Los Alamos National Laboratory), September 2006. "Investigation Report for Material Disposal Area T, Consolidated Unit 21-016(a)-99, at Technical Area 21," Los Alamos National Laboratory document LA-UR-06-6506, Los Alamos, New Mexico. (LANL 2006, 094151)
- LANL (Los Alamos National Laboratory), October 2007. "Subsurface Vapor-Monitoring Plan for Material Disposal Area T at Technical Area 21," Los Alamos National Laboratory document LA-UR-7037, Los Alamos, New Mexico. (LANL 2007, 098944)
- LANL (Los Alamos National Laboratory), February 2008. "Phase II Investigation Report for Material Disposal Area T at Technical Area 21, Revision 1," Los Alamos National Laboratory document LA-UR-08-1215, Los Alamos, New Mexico. (LANL 2008, 102182)

