Response to the Notice of Disapproval for the Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009 at Technical Area 50, Los Alamos National Laboratory (LANL), EPA ID No: NM0890010515, HWB-LANL-10-015, Dated March 29, 2010

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.

SPECIFIC COMMENTS

NMED Comment

1. *Section 2.3.3, Groundwater Monitoring, page 6, paragraph 2:*

   Permittees' Statement: "Antimony was detected at 6.88 µg/L in an unfiltered sample, slightly above the U.S. Environmental Protection Agency (EPA) drinking water maximum contaminant level (MCL) of 6 µg/L. This analytical result was qualified as estimated as a result of laboratory contamination."

   NMED Comment: The Permittees must provide a detailed explanation of why the analytical result for antimony was qualified as estimated as a result of laboratory contamination.

LANL Response

1. The result was qualified as estimated ("J" qualifier) because antimony was detected in the laboratory method blank at a concentration less than 5 times the sampling result. Because antimony was detected in the method blank, the reported result should be considered biased high. The text in section 2.3.3 has been revised to explain the result was qualified because antimony was detected in the laboratory method blank. Section 2.3.3 was also revised to incorporate the results of more recent monitoring at regional well R-46.

NMED Comment

2. *Section 4.2, Installation of Vapor-Monitoring Wells, page 12, paragraph 1:*

   Permittees' Statement: "Rather than use field sampling to determine borehole depth, the Laboratory proposes extending each new borehole to the bottom of the Guaje Pumice Bed (approximately 650 ft bgs) without collecting pore-gas samples during drilling."

   NMED Comment: The Permittees are not required to conduct field-screening during drilling of the new vapor-monitoring wells; however, NMED reminds the Permittees that if vapor sampling indicates that extent is not defined in each of the new vapor-monitoring wells, the Permittees must have to conduct additional phases of investigation.

LANL Response

2. Comment noted. No revision to the work plan text is needed.

NMED Comment

3. Section 4.2.2, Well Configuration, page 13, paragraph 2:

Permittees' Statement: "At each new location, a new borehole will be advanced to the bottom of the Guaje Pumice Bed (approximately 650 ft bgs) within 25 ft of the existing vapor-monitoring wells. Four sampling ports will be installed at depths of 500, 550, 600, and 650 ft bgs. The upper three screens will be installed in the Otowi Member and the lower screen in the Guaje Pumice Bed."

NMED Comment: Based on Section 3.1, Stratigraphic Units*, the Guaje Pumice Bed is approximately 35 feet (ft) thick. If this is the case, the Permittees proposed port depth of 650-ft will miss the Guaje Pumice Bed entirely. The Permittees must extend each of the four new vapor-monitoring wells so that there are three ports installed in the Otowi Formation, one port in the Guaje Pumice Bed, and an additional port at least 10-ft into the Tschicoma Formation.*

LANL Response

3. The proposed depth of 650 ft below ground surface (bgs) is an approximate depth based on the expected depth of the Guaje Pumice Bed. The intent of the well design is to place a monitoring port at the base of the Guaje Pumice Bed, regardless of actual depth. The text in sections 3.1 and 4.2.2 has been revised to indicate that the 650-ft-bgs depth is approximate and that the port will be placed at the base of the Guaje Pumice Bed. As described below, the total depth of the boreholes will be extended below the Guaje Pumice Bed and into the Tschicoma Formation dacite, if possible. The three new boreholes located next to the existing Phase II wells will have three ports installed in the Otowi Member, one port in the Guaje Pumice Bed, and, if possible, one port in the Tschicoma Formation dacite. Because of the limitations on the number of sampling ports that can be installed in a single borehole, the new borehole drilled to the south of Material Disposal Area (MDA) C will have two ports installed in the Otowi Member, one port in the Guaje Pumice Bed, and, if possible, one port in the Tschicoma Formation dacite.

   The drilling equipment used for the Phase II investigation was able to penetrate only approximately 2 ft into the Tschicoma Formation. The equipment used to drill regional well R-46 was able to penetrate the Tschicoma Formation, although it was necessary to use drilling fluids, including water and foaming agents (LANL 2009, 105592). It was assumed drilling fluids should not be used for vapor-monitoring wells, and drilling equipment similar to that used for the Phase II boreholes will be used for Phase III drilling. Therefore, drilling into the Tschicoma Formation was not proposed in the Phase III work plan.

   The text in sections 4.2 and 4.2.2 has been revised to indicate that the Laboratory will attempt to advance the boreholes at least 10 ft into the Tschicoma Formation without using drilling fluids. If the boreholes can be advanced, a sampling port will be installed in each borehole in the Tschicoma Formation. Otherwise, the boreholes will be backfilled with hydrated bentonite to the base of the Guaje Pumice Bed before the sampling port is installed at the base of the pumice bed. Figures 4.2-2 and 4.2-3 have been revised to include a sampling port in the Tschicoma Formation. Table 4.2-2 has also been revised and a footnote added to indicate a sampling port will be installed in the Tschicoma Formation if the boreholes can be advanced at least 10 ft into the formation without the use of drilling fluids.

NMED Comment

4. Section 5.1, Pore-Gas Sample Collection, page 16, paragraph 2:

Permittees' Statement: "Before samples are collected, the screened interval and sample collection system will be purged in accordance with SOP-06.31."

NMED Comment: The Permittees must describe the proposed method, purge times, and flow rates for each borehole.

LANL Response

4. Sampling systems are purged using a vacuum pump. The referenced standard operating procedure (SOP) (which has been renumbered EP-ERSS-SOP-5074) relies primarily on monitoring to determine the adequacy of purging rather than on specifying required purge rates and times. The procedure recommends a minimum purge time of 10 to 15 min but uses the concentration of gases in the purged air stream as the indicator of adequate purging. As described in the text, the sampling system is purged until concentrations of carbon dioxide, oxygen, and methane stabilize. These concentrations are recorded in field logs, along with purge rates and times. The text in section 5.1 and Table 5.0-1 have been revised to update the SOP number. Because all vapor samples will be collected from sampling ports installed in the wells, Table 5.0-2 has been revised to remove text describing collection of vapor samples using packers.

   It should be noted that the effect of purge time on vapor-sampling results was evaluated in a pilot test conducted at MDA C in 2008 (LANL 2008, 102651). The pilot test report was submitted to NMED in July 2008 and approved by NMED in September 2008 (NMED 2008, 102903). Samples were collected using the various sampling systems in use at that time after three different purge times (5, 10, and 20 min). The pilot study showed no impact of purge time on sampling results.

NMED Comment

5. Appendix C, Evaluation of the Locations of the Existing and newly Proposed Monitoring Wells for Detecting Potential Contamination in the Regional Aquifer from Material Disposal Area C, pages C-l through C-12:

The Permittees shall install one of the two regional aquifer wells at location MW-4 as identified on Figure C-3.0-2 of Appendix C. The other well shall be drilled equal distance between proposed wells MW-2 and MW-3 and 200 feet to the east as depicted on the same figure. This location will provide better downgradient detection monitoring, assuming the TCE plume continues to migrate vertically with diffusion to the southeast. The approximate 900 feet distance between the regional aquifer and the 40,000 to 50,000 ug/M^3 TCE isopleth (as depicted in Figures C-2.0-1 and C.20-2) and the complexities of the sub-Bandelier Tuff strata suggest the potential for the plume to reach the regional aquifer further to the southeast or outside the proposed line of regional wells MW-2 through MW-G. As a contingency, the Permittees must use water-level data collected at the first well (location of MW-4) to re-evaluate the surface of the regional water table and groundwater flow direction beneath MDA C. Based on the new water-level data and any other pertinent information derived from installation of the first well, the Permittees may propose to change the location of the second well. Any changes are subject to NMED review and approval.

LANL Response

5. The evaluation presented in Appendix C was designed to provide well locations having the highest probability of detecting releases from MDA C to the regional aquifer based on existing water-level data. This approach assumed that both regional wells will be installed concurrently to expedite the collection of groundwater data. The approach presented in NMED's comment calls for collecting water-level data from the first well before the second well is installed. This approach will allow estimates of the site-specific flow direction to be refined and the proposed well location adjusted, if necessary, before the second well is installed. This approach, however, will require more time to install both wells.

   Section 4.3.1 of the work plan has been revised to incorporate the approach and to include the well locations discussed in NMED's comment. The schedule in section 7.0 has also been revised to account for the longer period of time needed to install the two regional wells consecutively rather than concurrently.

REFERENCES

LANL (Los Alamos National Laboratory), July 2008. "Pilot Test Investigation Report for Evaluating Vapor-Sampling Systems at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-08-4814, Los Alamos, New Mexico. (LANL 2008, 102651)

LANL (Los Alamos National Laboratory), March 2009. "Completion Report for Regional Aquifer Well R-46," Los Alamos National Laboratory document LA-UR-09-1338, Los Alamos, New Mexico. (LANL 2009, 105592)

NMED (New Mexico Environment Department), September 10, 2008. "Approval, Pilot Test Investigation Report for Evaluating Vapor-Sampling Systems at Material Disposal Area C," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 102903)