Response to Comments on the Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area L Fourth Quarter Fiscal Year 2011, Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-11-096, Dated December 2011

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The comments are divided into general comments from the letter dated January 11, 2012, and additional comments received by email from Ben Wear on February 1 and February 3, 2012. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment.

GENERAL COMMENTS

NMED Comment

1. *In section 6.0, Summary, the Permittees state, "[a] suspect TCE result was detected at borehole 54-24399, the deepest port at MDA L. Before the fourth quarter sampling event, the few VOCs detected in this port have been far below screening levels. This port will be resampled to resolve this apparent discrepancy, and the data will be submitted to NMED."*

   The statement above is not accurate. According to the RACER database, TCE was detected on September 3, 2008 at this same location and port at more than double the concentration detected during the fourth quarter FY2011 sampling event. On the same date, PCE was detected at 97% of the screening level. TCE was also detected at this location and port on three other occasions at concentrations ranging from 80% - 90% of the screening level. These concentration are not "far below screening levels."

LANL Response

1. NMED is correct that TCE(trichloroethene), PCE (tetrachloroethene) and 1,2-dichloroethane have exceeded either their respective screening values or half their screening value over the history of this borehole. Although concentrations measured during the most recent sampling of this borehole are within the normal range of variability for this location, borehole 54-24399 was conservatively recommended for resampling because the fourth quarter fiscal year (FY) 2011 TCE (trichloroethene) result was higher than observed in the previous nine sample results. Based upon a February 13, 2012, telephone conference with Ben Wear, the Laboratory agrees with NMED that resampling is not necessary.

   The following text in section 6 of the report has been modified remove the phrase "far below screening values" and the recommendation to resample borehole 54-24399:

   > A TCE result exceeding the SL was detected at borehole 54-24399. Although this result is higher than for the previous nine samples collected since 2009, it is consistent with the normal range of variability for this location. The fourth quarter of FY2011 result may differ from more recent results because the sample was collected over a shorter depth interval than previous samples (section 2.1, Table 2.0-1). This most recent sample result does not, however, affect the

recommendations for remedial alternatives presented in the September 2011 Corrective Measures Evaluation Report for Material Disposal Area L, Revision 2.

The corresponding text in the executive summary has been deleted.

Table 2.0-1 of the original periodic monitoring report included a table note to indicate that borehole 54-24399 was sampled over a different sampling interval than the NMED-approved vapor-monitoring sampling interval. The following text was added to section 2.1 to include this different sampling interval as a deviation. In addition, the table note was corrected to show the correct sampling interval.

Borehole 54-24399 was sampled over a shorter depth interval than at which it was historically sampled (Table 2.0-1). For the fourth quarter of FY2011 sampling event, a dual-packer system was used to sample the borehole over an interval from 550 to 551 ft bgs rather than the single-packer system, which has historically been used to sample over the open interval in the borehole from 550 to 608 ft bgs. Any future samples will be collected from the NMED-approved vapor-monitoring sampling interval.

Replacement pages for these three sections (Executive Summary, section 2.1, and section 6.0) and Table 2.0-1 are included with this response.

NMED Comment

2. *The last paragraph of Section 6.0, Summary, States, "[i]n a letter submitted to NMED on November 1, 2011 (LANL 2011, 207416), DOE and Los Alamos National Security, LLC, requested to discontinue quarterly vapor sampling at MDA L and recommended semiannual vapor sampling at MDA L. A letter was received from NMED on November 14, 2011 (NMED 2011, 207576), approving this request."*

   Again, the statement above is not accurate. The excerpt from the November 14, 2011 NMED letter referenced above states, "[i]n the Request, the Permittees propose to sample the current approved sampling ports at MDA L on a biannual basis. In accordance with Governor Martinez' policy to prioritize groundwater and surface water protection, NMED directs the Permittees to discontinue all vapor sampling at MDA L and to divert those resources earmarked for biannual vapor sampling at MDA L to the evaluation of corrective measures at MDA C due to the higher potential impacts to groundwater from vapor-phase contamination at MDA C."

LANL Response

2. NMED is correct that the Laboratory's statement was inaccurate. The text in the Executive Summary and in the last paragraph of section 6.0 has been changed to state the following:

   In a letter submitted to NMED on November 1, 2011 (LANL 2011, 207416), DOE and Los Alamos National Security, LLC, requested to discontinue quarterly vapor sampling at MDA L and recommended biannual vapor sampling at MDA L. A letter was received from NMED on November 14, 2011 (NMED 2011, 207576), granting the suspension of vapor sampling activities until the implementation phase for the selected remedy at MDA L.

   Replacement pages for these two sections are included.

EMAIL COMMENTS FROM BEN WEAR DATED FEBRUARY 1, 2012

NMED Comment

After sending comments on the 4q2011 PMR for MDA L to Mitch Goldberg, his response included an indication that a vapor sample showing TCE at 5700 ug/m3 had been qualified as ND from 4q2008. Upon reviewing the 4q2008 PMR, I found several problems:

1. *6 summa canisters were submitted for the one sample in question. There was no indication of what the 5 other canisters were utilized for, other than "QC" on the COC.*

LANL Response

1. The quality control (QC) samples routinely collected in the field during pore-gas sampling include field duplicates (FDs), field blanks (FBs), and performance evaluation (PE) samples. Performance equipment blank (PEB) samples are not collected during vapor sampling at the Laboratory.

   The FD sample is collected by connecting a SUMMA canister to the sample train immediately following the collection of the primary volatile organic compound (VOC) sample at a given port and then filling the SUMMA canister with a vapor sample.

   The FB sample is collected by connecting a nitrogen tank to the sample train, purging the sample train with nitrogen, and then filling a SUMMA canister with nitrogen that is run through the sample train.

   The PE sample is collected by connecting the Brüel and Kjaer (B&K) multi-gas analyzer check-gas cylinder to a SUMMA canister and then filling the SUMMA canister with the B&K check gas.

   The five QC samples were reported as one FD, three FBs, and one PEB, which is likely a PE sample. The Laboratory believes that the sample identified as a "PEB" sample was actually a PE sample (i.e., a sample spiked with known composition). The sample labeled as a PEB has high concentrations of 1,1,1-TCA [(trichloroethane(1,1,1-)], TCE, PCE, and 1,1-DCE [dichloroethylene(1,1-)]. The field team collected a PE sample during each sampling campaign. Because the fourth quarter 2008 sampling campaign is the only time a PEB was indicated, the Laboratory believes that this sample was actually a PE sample. Note that the PE sample uses the B&K check gas; the field team supplied the Laboratory with the certificate of analysis for that gas, which included 1,1,1-TCA, TCE, PCE, and N_2, but not 1,1-DCE.

NMED Comment

2. *32 results were <5 times the equipment blank and were qualified as not detected.*

LANL Response

2. The results for the sample at 54-24399 have been determined to be detections. The 32 results, all from 54-24399, were qualified during secondary validation because of incorrect comparisons with results from a corresponding QC sample labeled as a PEB (reason code of V4d). All of these 32 results are from the single port at 54-24399. Each of these 32 results is actually a duplicate value because it accounts for the two units of measure (ppmv, $\mu g/m^3$) used for reporting pore-gas concentrations, so effectively only 16 results are affected by the error. As discussed in the response to NMED Comment 1 (February 1 email), this QC sample was actually a PE sample. When the

primary sample for borehole 54-24399 is compared with the three FBs, the 1,1,1-TCA, TCE, PCE, and 1,1-DCE actually represent detections. The Laboratory will update the database to correct the sample qualifiers to detection status.

NMED Comment

3. The report does not include any description of how an equipment blank for a vapor sample was collected.

LANL Response

3. The periodic monitoring report (PMR) text uses the terms “field blank” and “equipment blank” interchangeably. The samples labeled as “field blanks” are effectively equipment rinsate blanks. This procedure is described in the response to NMED Comment 1 (February 1 email).

NMED Comment

4. The reported concentrations of the one summa canister that we are assuming is being utilized as an equipment blank were very high concentrations and very even-numbered concentrations for a limited number of constituents, possibly indicating it was a spiked sample. For instance, 1,1,1 TCA at 200000 ug/m^3 and TCE at 100000 ug/m^3.

LANL Response

4. See the response to NMED Comment 2 (February 1 email).

NMED Comment

5. NMED requires a detailed explanation of the procedures carried out in the field to collect the equipment blank and all other QC samples, a detailed explanation of what each of the other 5 summa canisters were, a detailed explanation of why there were such high concentrations of a limited number of constituents in the equipment blank while other constituents were all non-detect, and why over 10% of the samples collected failed the QC.

LANL Response

5. See previous responses and the next LANL response.

EMAIL COMMENTS FROM BEN WEAR DATED FEBRUARY 3, 2012

NMED Comment

Please ignore the comment in my previous email asking for an explanation of "why over 10% of the samples collected failed the QC. I confused "results" with "samples" and that is obviously not the case. I apologize.

In looking further at the 2008 PMR and the analytical data reports, I have another question.

1. *One difference that I noted between the 2008 PMR and the current PMRs is that in 2008, there was a section titled Field Blanks and Equipment Blanks. The current PMRs title that section as Field Blanks, Equipment Blanks, and Performance Evaluations, where the Performance Evaluation is a sample of the span gas used for the field-screening instrument. Were "Performance Evaluation" samples collected in 2008?*

LANL Response

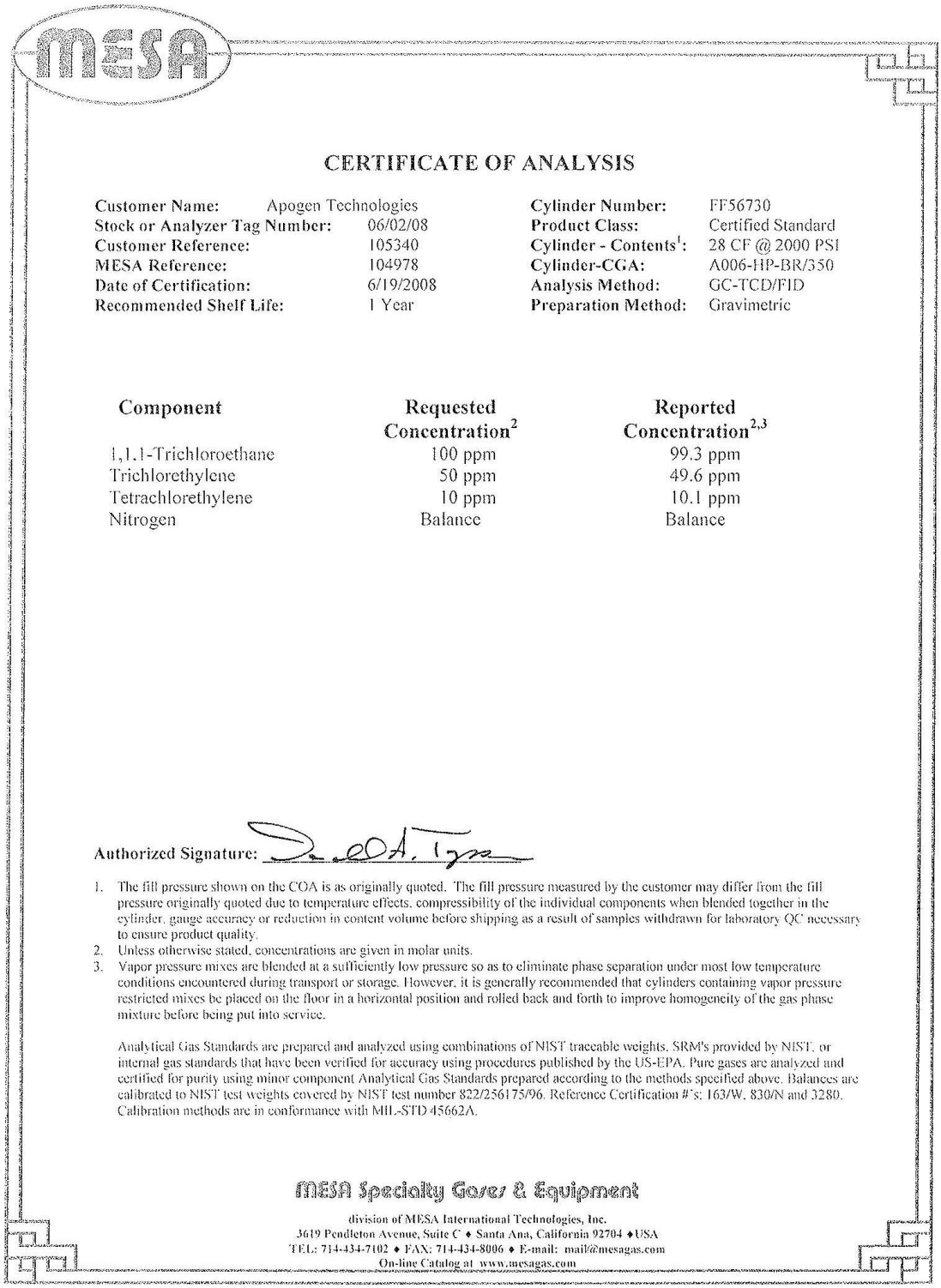
1. Yes, seven PE samples were collected in 2008. This number increases to eight if the PEB sample is assumed to be a PE sample.

NMED Comment

2. *The text of Appendix B of the 2008 PMR states that the qualification was based on an "equipment blank". In the data validation narrative from LANL for this particular sample, LANL refers to the sample as the "PEB". There is no reference or definition as to what PEB stands for. Considering that there were such high concentrations of a specific set of constituents on the summa canister labeled "Client Sample ID: MD54-08-14683", is it possible that this was a sample of the span gas used for the B&K field instrument? Can you provide NMED with the specifications of the span gas utilized during the 4qFY2008 sampling event?*

LANL Response

2. The Laboratory agrees with NMED that the "PEB" sample was a sample of the B&K check gas. The certificate of analysis for the check gas is included. As noted above, the Laboratory will change the detection status of the samples from borehole 54-24399 in the database.



CERTIFICATE OF ANALYSIS

Customer Name:	Apogen Technologies	**Cylinder Number:**	FF56730
Stock or Analyzer Tag Number:	06/02/08	**Product Class:**	Certified Standard
Customer Reference:	105340	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104978	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	6/19/2008	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	1 Year	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
1,1,1-Trichloroethane	100 ppm	99.3 ppm
Trichlorethylene	50 ppm	49.6 ppm
Tetrachlorethylene	10 ppm	10.1 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

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