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# Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area T, Consolidated Unit 21-016(a)-99, at Technical Area 21, April to June 2010

Los Alamos
NATIONAL LABORATORY
EST.1943

Prepared by the Environmental Programs Directorate

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Responsible project manager:

| Bruce Wedgeworth | Bruce Wedgeworth | Project Manager | Environmental Programs | 10/14/10 |
|---|---|---|---|---|
| Printed Name | Signature | Title | Organization | Date |

Responsible LANS representative:

| Michael J. Graham | M. J. Graham | Associate Director | Environmental Programs | 19 Oct 10 |
|---|---|---|---|---|
| Printed Name | Signature | Title | Organization | Date |

Responsible DOE representative:

| George J. Rael | George J. Rael | Manager | DOE-LASO | 10/20/10 |
|---|---|---|---|---|
| Printed Name | Signature | Title | Organization | Date |

## EXECUTIVE SUMMARY

This periodic monitoring report summarizes the latest results of the vapor-monitoring activities (April–June 2010) conducted at Material Disposal Area (MDA) T, Consolidated Unit 21-016(a)-99, within Technical Area 21 (TA-21) at Los Alamos National Laboratory (LANL or the Laboratory). The objectives of vapor-monitoring at MDA T are (1) to collect additional samples from vapor-monitoring wells at MDA T and (2) to compare the results with previously detected volatile organic compound (VOC) concentrations and tritium activities in pore gas beneath MDA T.

Samples taken during the current quarter were collected in April and June 2010 from vapor-monitoring wells 21-25262, 21-25264, 21-603058, 21-603059 and 21-607955, all located outside the MDA T nuclear facility boundary. Vapor-monitoring wells 21-25262 and 21-603059 are located immediately south of MDA T. Vapor-monitoring wells 21-25264, 21-603058, and 21-607955 are located immediately north of MDA T along North Perimeter Road. Monthly sampling was discontinued after April 2010 when the quarterly sampling schedule resumed.

Pore-gas data collected from all locations sampled in April and June of 2010 are presented and discussed in this report. Pore-gas data from the previous three quarters of vapor monitoring at MDA T (July to September 2009, October to December 2009, and January to March 2010) are also presented and compared with the data from the current quarter, as appropriate, to help establish trends over time.

A total of 24 VOCs were detected in MDA T pore gas during the April to June 2010 sampling activities, and the results were consistent with previous sampling results for permanent vapor-monitoring wells 21-25262, 21-25264, 21-603058, and 21-603059. Pore-gas analytical results obtained from samples collected during the initial rounds of sampling at vapor-monitoring well 21-607955 also reflected the VOC trends observed at the other MDA T vapor-monitoring wells, with the exception of acetone and toluene. Acetone and toluene were detected the first time in November 2009 at concentrations of 30,000 µg/$m^3$ and 690 µg/$m^3$, respectively, at total depth (TD). In subsequent sampling rounds, toluene concentrations were consistently lower (e.g., 430 µg/$m^3$ and 230 µg/$m^3$ for toluene in the March 2010 and June 2010 rounds, respectively). Acetone was detected at a concentration of 99 µg/$m^3$ in March 2010 and was not detected in June 2010.

A VOC screening evaluation identified three VOCs, methylene chloride, tetrachloroethene, and 1,1,2-trichloroethane, in MDA T pore gas at concentrations exceeding pore-gas screening levels based on equilibrium partitioning with groundwater screening. However, the screening levels were not exceeded for any VOCs for samples collected from the deepest sampling ports; therefore, the current VOC concentrations detected at MDA T are not high enough to result in groundwater contamination above applicable regulatory criteria.

Tritium activities in vapor-monitoring wells 21-25262, 21-25264, 21-603058, and 21-607955 were consistently low at TD but showed multiple peaks at varying depths in the shallow to middle ports. In intermediate vapor-monitoring well 21-603059, tritium activities generally increased with depth to TD.

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## 1.0 INTRODUCTION

This report presents the results of vapor-monitoring activities conducted during April–June 2010 at Material Disposal Area (MDA) T, Consolidated Unit 21-016(a)-99, in Technical Area 21 (TA-21) at Los Alamos National Laboratory (LANL or the Laboratory). These activities are being conducted per the requirements outlined in the MDA T vapor-monitoring plan and the associated New Mexico Environment Department (NMED) approval with modifications (LANL 2007, 098944; NMED 2007, 098946) and the approved MDA T Phase III investigation work plan and associated NMED correspondence (LANL 2009, 105645; NMED 2009, 105691; NMED 2009, 106455). 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.

The objectives of the MDA T vapor-monitoring activities are (1) to collect additional vapor samples from vapor-monitoring wells at MDA T and (2) to compare the results with previously detected volatile organic compound (VOC) concentrations and tritium activities beneath MDA T. In addition, this report presents the results of a screening evaluation of the pore-gas VOC data that compares maximum concentrations of VOCs in pore gas to pore-gas screening levels (SLs) based on equilibrium partitioning with groundwater SLs. This conservative screening process evaluates the potential for the observed VOC concentrations to result in contamination of groundwater above applicable regulatory criteria.

To date, intermediate vapor-monitoring wells 21-25264, 21-603058, and 21-603059 have been sampled for 18 rounds, from October 2007 to June 2010; vapor-monitoring well 21-25262 has been sampled for 12 rounds, from June 2009 to June 2010; and the newest vapor-monitoring well 21-607955 has been sampled for 7 rounds from December 2009 to June 2010. Table 1.0-1 summarizes the MDA T vapor-monitoring sampling quarters, events, rounds and dates. Monthly monitoring was discontinued after April 2010 and quarterly sampling resumed. All pore-gas samples were submitted for off-site laboratory analysis of VOCs and tritium.

This report primarily presents and discusses results obtained during the most recent quarter of monitoring activities at MDA T; however, vapor data presented in the three consecutive quarterly periodic monitoring reports immediately before the current quarter for MDA T (July–September 2009, October–December 2009, and January–March 2010) are included in the data evaluation section of this report to establish trends over time.

Future quarterly sampling (September and December 2010) will be presented in the next periodic monitoring report.

### 1.1 Site Location and Description

MDA T is located within TA-21 on DP Mesa (Figure 1.1-1) and contains the following waste storage and disposal sites (Figure 1.1-2):

- four absorption beds (subsurface);
- multiple buried shafts (subsurface); and
- a former retrievable waste storage area (subsurface).

Current vegetation at MDA T includes grasses, chamisa bushes, and two young ponderosa pines. The top of the regional aquifer occurs approximately 1300 ft below MDA T, based on water-level information from regional monitoring well R-6 (Kleinfelder 2005, 091693). The MDA T investigation report (LANL

2006, 094151) presents further details regarding MDA T waste storage and disposal sites, operations, and historical investigation activities.

## 2.0 SCOPE OF ACTIVITIES

As directed by the approved MDA T vapor-monitoring plan (LANL 2007, 098944; NMED 2007, 098946) and the approved MDA T Phase III investigation work plan (LANL 2009, 105645; NMED 2009, 105691; NMED 2009, 106455), 18 rounds of pore-gas field-screening and sampling activities have been completed at intermediate-depth vapor-monitoring wells 21-603058, 21-603059, and 21-25264; 12 rounds have been completed at deep vapor-monitoring well 21-25262; and 7 rounds have been completed at deep vapor-monitoring well 21-607955 (Figure 1.1-2 and Table 2.0-1). The as-built well constructions as applicable to the five MDA T vapor-monitoring wells are described below.

Per the approved MDA T vapor-monitoring plan (LANL 2007, 098944; NMED 2007, 098946), five vapor-sampling ports were installed at wells 21-603058 and 21-25264, and six vapor-sampling ports were installed at well 21-603059 at the following intervals:

- base elevation of the nearby disposal unit (69–81 ft below ground surface [bgs]),
- intermediate depths correlated to the 2005–2006 packer sampling depths at locations 21-25262 and 21-25263, and
- borehole total depth (TD) (342–375 ft bgs).

Per the approved MDA T Phase III investigation work plan (LANL 2009, 105645; NMED 2009, 105691; NMED 2009, 106455), nine vapor-sampling ports were installed at well 21-25262 at the following intervals:

- depths correlated to the sampling port depths at well 21-603059 (sampling ports 1–4); and
- depths correlated to different lithologic units encountered beneath MDA T (i.e., Cerro Toledo interval of the Bandelier Tuff [sampling port 5], Otowi Member of the Bandelier Tuff [sampling ports 6–8], and the Guaje Pumice Bed [TD, sampling port 9]).

Per the approved MDA T Phase III investigation work plan (LANL 2009, 105645; NMED 2009, 105691; NMED 2009, 106455), 11 vapor-sampling ports were installed at well 21-607955 at the following intervals:

- depths correlated to the intermediate vapor-monitoring wells (sampling ports 1–6); and
- depths within different lithologic units encountered beneath MDA T (e.g., Otowi Member of the Bandelier Tuff) (sampling ports 7 and 8); Guaje Pumice Bed (sampling port 9); and the Puye Formation (sampling ports 10 and 11).

During the most recent quarter of sampling activities (April and June 2010), a total of 85 pore-gas samples (68 characterization and 17 quality assurance/quality control [QA/QC]) were collected for VOC analysis, and 78 samples (68 characterization and 10 QA/QC) were collected for tritium analysis from

- all 5 ports in well 21-25264
- 5 out of 6 ports in well 21-603059
- 4 out of 5 ports in well 21-603058

- all 9 ports in well 21-25262
- all 11 ports in well 21-607955

Samples were not collected at port 2 in either well 21-603058 or 21-603059 for reasons discussed in section 2.1. Field duplicate (FD) and field blank (FB) samples were collected at a minimum frequency of 1 for every 10 samples.

Table 2.0-1 summarizes the MDA T pore-gas sampling depths and sample collection dates for the current and previous three quarters (July 2009–June 2010) by well location. Tables 2.0-2 through 2.0-6 summarize, by well location, the July 2009–June 2010 samples collected at MDA T monitoring wells 21-25262, 21-25264, 21-603058, 21-603059, and 21-607955 and their respective analyses.

All samples were collected in accordance with the current version of Standard Operating Procedure (SOP) 5074, "Sampling for Sub-Atmospheric Air," and submitted to off-site analytical laboratories for VOC analysis using U.S. Environmental Protection Agency (EPA) Method TO-15 and for tritium analysis using EPA Method 906.0. Further discussion of the field methods used for pore-gas field-screening and sample collection are presented in Appendix B. Field chain-of-custody forms and sample collection logs are provided on CD (Appendix D). No investigation-derived waste was generated during execution of vapor-monitoring activities at MDA T.

Pore-gas field-screening results are presented in section 4, and pore-gas analytical results are presented in section 5. Any deviations from the scope of activities presented in the approved MDA T vapor-monitoring plan (LANL 2007, 098944; NMED 2007, 098946) and/or the approved MDA T Phase III investigation work plan (LANL 2009, 105645; NMED 2009, 105691; NMED 2009, 106455) that relate to periodic monitoring activities are described in the following section.

### 2.1 Deviations

Pore-gas samples were not collected from port 2 in either vapor-monitoring well 21-603058 or 21-603059 during the April and June 2010 sampling activities at MDA T. As previously reported, sampling port 2 (160.5–165.5 ft bgs) in vapor-monitoring well 21-603058 stopped producing pore gas after February 2008 (round 2). Because there was no evidence of mechanical failure during initial installation, the Laboratory believes that the inoperability of the ports is due to the ports being installed within the Bandelier Tuff, a densely welded unit, which may inhibit vapor flow (LANL 2009, 105187). Similarly, sampling port 2 (112.5–117.5 ft bgs) in vapor-monitoring well 21-603059 has not produced pore gas since it was installed, possibly because of its location within the same densely welded unit (unit 2) (LANL 2009, 105187). During every sampling round, the inoperability of these ports is verified during field screening. The Laboratory will continue to verify the operability of these ports during future field screening.

## 3.0 REGULATORY CRITERIA

The Compliance Order on Consent does not identify any cleanup standards, risk-based SLs, risk-based cleanup goals, or other regulatory criteria for pore gas at MDA T. Because the potential for groundwater contamination is the primary concern with subsurface VOC vapors, pore-gas SLs were developed to evaluate this potential. These SLs are based on equilibrium partitioning using the appropriate Henry's law constant with groundwater cleanup levels. This screening process evaluates the potential for the reported VOC concentrations to result in contamination of groundwater above applicable regulatory criteria. Details regarding pore-gas screening evaluation criteria are presented in the following section. Results of the pore-gas screening evaluation are presented in section 5. No applicable standards for tritium in pore vapor are available.

The screening analysis evaluated the groundwater concentration that would be in equilibrium with the maximum concentrations of VOCs detected at MDA T during the current vapor-monitoring quarter (April to June 2010). The equilibrium relationship between air and water concentrations is described by the following equation.

$$C_{water} = C_{air} / H' \qquad \textbf{Equation 3.0-1}$$

Where $C_{water}$ = the volumetric concentration of contaminant in water,

$C_{air}$ = the volumetric concentration of contaminant in air, and

$H'$ = dimensionless form of Henry's law constant.

If the predicted concentration of a particular VOC in groundwater is less than the groundwater SL, then no potential exists for an exceedance of the groundwater cleanup level at the contaminant/groundwater interface.

Because no SLs for pore gas address the potential for groundwater contamination, the screening evaluation was based on groundwater standards or tap water SLs and Henry's law constants that describe the equilibrium relationship between vapor and water concentrations. The source of the Henry's law constants was the NMED technical background document (NMED 2009, 106420) or the EPA regional screening tables (http://www.epa.gov/region09/superfund/prg/). The following dimensionless form of Henry's law constant was used:

$$H' = \frac{C_{air}}{C_{water}} \qquad \textbf{Equation 3.0-2}$$

Equation 3.0-3 can be used to calculate the screening value (SV):

$$SV = \frac{C_{air}}{1000 \times H' \times SL} \qquad \textbf{Equation 3.0-3}$$

Where $C_{air}$ = the concentration of a particular VOC in the pore-gas sample (µg/m$^3$),

$H'$ = the dimensionless Henry's law constant,

$SL$ = the groundwater screening level (µg/L), and

$1000$ = a conversion factor from L to m$^3$.

The SLs are the groundwater standards or tap water SLs. The groundwater standards are the EPA maximum contaminant level (MCL) or New Mexico Water Quality Control Commission (NMWQCC) groundwater standard, whichever is lower. If there is no MCL or NMWQCC standard, the NMED tap water SL is used. If there is no NMED SL, the EPA regional tap water SL (http://www.epa.gov/region09/superfund/prg/ is used and adjusted to $10^{-5}$ risk for carcinogens. The numerator in Equation 3.0-3 is the actual concentration of the VOC in pore gas, and the denominator represents the pore-gas concentration needed to exceed the SL. Therefore, if the SV is less than 1, the concentration of the VOC in pore gas does not exceed the SL, even if the VOC plume were to come in contact with groundwater. Table 3.0-1 presents the calculated concentrations of contaminants in pore gas corresponding to groundwater SLs.

## 4.0 FIELD-SCREENING RESULTS

Before each sampling event, field screening was performed in each vapor-monitoring well and targeted sampling interval to ensure percent carbon dioxide (%$CO_2$) and percent oxygen (%$O_2$) levels at each sampling port had stabilized at values representative of subsurface pore-gas conditions. Table 4.0-1 presents a summary of all field-screening results obtained during the current quarter. The $CO_2$ and $O_2$ field-screening results are presented in Appendix B.

Atmospheric information was obtained from http://www.srh.noaa.gov/data/obhistory/KLAM.html on each day of sampling using the closest automated weather station to MDA T (Los Alamos Airport, latitude 35.88°, longitude 106.28°). Table 4.0-2 summarizes the barometric pressure, relative humidity, and temperature for the sampling dates.

## 5.0 ANALYTICAL DATA RESULTS

All analytical data were subject to extensive QA/QC and data validation reviews in accordance with Laboratory guidance and procedures. The QA/QC and data validation review for April–June 2010 for MDA T pore-gas data is presented in Appendix C. All validated analytical results from April–June 2010 pore-gas sampling and from the three previous sampling quarters (July 2009–March 2010) are presented on a CD in Appendix D. Similar detail regarding vapor data collected during July 2009–March 2010 was presented in previous periodic monitoring reports (LANL 2009, 105187; LANL 2009, 107448; LANL 2009, 106665; LANL 2010, 108529).

Vapor analytical sampling data are also available at the Risk Analysis, Communication, Evaluation, and Reduction (RACER) website (http://www.racernm.com/).

### 5.1 VOC Pore-Gas Results

VOC results from the current and previous three vapor-monitoring quarters (July 2009–June 2010) are presented by well location in Tables 5.1-1 through 5.1-5. Concentration with depth profiles for detected VOCs from each well sample collected during April and June 2010 are presented by sampling round in Figures 5.1-1 through 5.1-10. The results showed several general spatial trends that were generally consistent with results obtained during earlier sampling rounds (LANL 2009, 105187; LANL 2009, 106665; LANL 2009, 107448; LANL 2010, 108529; LANL 2010, 109254; LANL 2010, 110059). Data associated with July 2009–March 2010 have been previously presented and are included for comparison purposes only.

A total of 24 VOCs were detected in MDA T pore gas during the current quarter sampling activities and the results are consistent with previous sampling results. Five VOCs, methylene chloride, carbon tetrachloride, chloroform, trichloroethene (TCE), and tetrachloroethene (PCE), were consistently detected at the greatest concentrations relative to other detected VOCs during the MDA T monitoring period. Concentration with depth profiles for these five VOCs for all samples collected during the current quarter and the previous three quarters are presented by well for comparison in Figures 5.1-11 through 5.1-15. These five VOCs and other VOCs of interest (e.g., acetone, toluene, 1,1,2-trichloroethane) are discussed below.

- Methylene chloride pore-gas concentrations consistently increased with depth to TD in intermediate-depth vapor-monitoring wells 21-25264, 21-603058, and 21-603059. In deep vapor-monitoring well 21-25262, methylene chloride concentrations increased with depth to a maximum at approximately 475–575 ft bgs before decreasing with depth to TD (Figure 5.1-11). In deep vapor-monitoring well 21-607955, methylene chloride concentrations generally increased to a

maximum at approximately 375–475 ft bgs and then decreased to nondetections below approximately 800 ft bgs.

- Carbon tetrachloride pore-gas concentrations also increased with depth in vapor-monitoring wells 21-25264, 21-603058, 21-603059, and 21-25262 to approximately 250–350 ft bgs. Below approximately 350 ft bgs, carbon tetrachloride concentrations decreased with depth to TD at all vapor-monitoring wells, except for well 21-603058 where concentrations remained constant from 250 ft bgs to TD (Figure 5.1-12). In vapor-monitoring well 21-607955, carbon tetrachloride concentrations showed an increase in concentration to approximately 350 ft bgs, followed by a decrease in concentration to nondetections below approximately 800 ft bgs.
- Chloroform pore-gas concentrations displayed an S-shaped profile in vapor-monitoring well 21-25262, where the concentrations were higher near the surface, lower at the lower-middle ports, and lowest in the upper-middle ports and at TD (Figure 5.1-13). In vapor-monitoring well 21-603059, chloroform concentrations decreased from a maximum near the surface (port 1, 80 ft bgs) to generally constant concentrations from approximately 190 ft to TD at 377.5 ft. Chloroform results from vapor-monitoring wells 21-25264 and 21-603058 were less consistent between sampling rounds but on average the concentrations increased slightly with depth to TD in both wells. In vapor-monitoring well 21-607955, chloroform concentrations were generally consistent to approximately 325 ft bgs. Some showed a slight increase at middle depths (350–500 ft bgs), and then a decrease to nondetect values at TD.
- TCE pore-gas concentrations displayed an S-shaped profile in both vapor-monitoring well 21-25262 and in vapor-monitoring well 21-603059 but not in vapor-monitoring wells 21-25264 or 21-603058 (Figure 5.1-14). In vapor-monitoring well 21-25264, TCE concentrations decreased from a maximum near the surface port to approximately 150 ft bgs and remained generally constant to TD. In vapor-monitoring well 21-603058, TCE concentration increased to a maximum detected concentration at approximately 250 ft bgs and also remained generally constant to TD. In vapor-monitoring well 21-607955, TCE concentrations increased to approximately 350 ft bgs and decreased to nondetect values below approximately 700 ft bgs.
- PCE concentrations consistently decreased with depth to TD in all five vapor-monitoring wells (Figure 5.1-15).
- Trichloroethane(1,1,2-) was detected consistently in four of the five vapor-monitoring wells at MDA T. Trichloroethane(1,1,2-)increased with depth to approximately 475 ft bgs in vapor-monitoring well 21-25262, and then decreased to TD at 690 ft bgs. Concentrations increased with depth in vapor-monitoring well 21-603059. Trichloroethane(1,1,2-) was detected at lower concentrations in vapor-monitoring wells 21-603058 and 21-607955.
- Acetone and toluene were detected at their maximum concentrations at TD (approximately 950 ft bgs) during the initial round (early December 2009) of pore-gas sampling in vapor-monitoring well 21-607955 (concentrations of 30,000 µg/$m^3$ and 690 µg/$m^3$, respectively). These samples were collected under expedited sampling conditions, and similar detections were not observed in any pore-gas data collected from the other MDA T wells. In subsequent rounds of pore-gas sampling at vapor-monitoring well 21-607955 (January–March 2010), acetone concentrations at TD were again elevated relative to shallower depths (maximum concentration of 99 µg/$m^3$ for the March 2010 sample round) but at concentrations considerably lower than the first round. Concentrations detected in April 2010 (8.8 µg/$m^3$ and 15 µg/$m^3$ at 650 and 950 ft bgs, respectively) were the lowest reported to date. Acetone was not detected in vapor-monitoring well 21-607955 in June 2010. Toluene was detected at TD at elevated concentrations relative to shallower depths in both the January–March and April and June 2010 rounds (maximum

concentration of 500 µg/$m^3$ and 300 µg/$m^3$, respectively) but at lower concentrations than the first round.

- Detected concentrations of benzene, bromodichloromethane, 2-butanone, carbon disulfide, cyclohexane, 1,4-dichlorobenzene; dichlorodifluoromethane; 1,2-dichloroethane; 1,1-dichloroethene; 1,2-cis-dichloroethene; ethanol; 4-ethyltoluene; n-heptane; 1,1,2-trichloro-1,2,2-trifluoroethane; 1,1,1-trichloroethane;1,1,2-trichloroethane; and 1,2,4-trimethylbenzene showed no trends. These VOCs were either infrequently detected or were detected at very low concentrations (at or near the standard quantitation limits [SQLs]).
- Nineteen VOCs detected during all previous quarters of vapor monitoring (October 2007–March 2010), including bromoform; bromomethane; 1,3-butadiene; 1-butanol; chlorodibromomethane; chlorodifluoromethane; chloromethane; 1,2-dichlorobenzene; ethylbenzene; hexane; 2-hexanone; methanol; 4-methyl-2-pentanone; 2-propanol; propylene; tetrahydrofuran; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene, were not detected during the current quarter (April–June 2010). During previous rounds, these VOCs were infrequently detected or detected at very low concentrations (at or near the SQL).
- No VOCs were detected for the first time during the April and June 2010 sampling events.

### 5.2 VOC-Screening Evaluation

The VOC results from the April and June 2010 sampling rounds were screened to evaluate whether the concentrations of VOCs pose a potential source of groundwater contamination. The evaluation included the 21 VOCs detected samples collected at MDA T for which there are MCLs, NMWQCC standards, or NMED or EPA regional tap water SLs (Table 5.2-1). Ethanol, 4-ethyltoluene, and n-heptane were detected but do not have MCLs, NMWQCC standards, or tap water SLs, and were not evaluated.

The results of the April and June 2010 VOC screening evaluation are presented in Table 5.2-1. The SVs were less than 1.0 for all detected VOCs, except for methylene chloride, tetrachloroethene, and 1,1,2-trichloroethane. The concentrations of methylene chloride in 26 out of 68 samples collected resulted in SVs greater than 1.0, with a maximum SV of 3.85 (Figure 5.2-1). The concentration of tetrachloroethene in 1 out of 68 samples collected resulted in an SV greater than 1.0, with an SV of 1.03 (Figure 5.2-1). The sample with the SV exceeding 1.0 was collected at a depth of 80-85 ft bgs. The concentration of 1,1,2-trichloroethane in 2 out of 68 samples collected resulted in an SV equal to or greater than 1.0, with a maximum SV of 1.18 (Figure 5.2-2). Both samples with SV exceeding 1.0 were collected at a depth of 472–478 ft bgs. SLs were not exceeded for any VOCs for samples collected from the four deepest sampling ports; therefore, the current VOC concentrations detected at MDA T are not high enough to result in groundwater contamination above applicable regulatory criteria.

### 5.3 Pore-Vapor Tritium Results

The results of the current and previous three quarters (July 2009–June 2010) of sampling for tritium are presented by vapor-monitoring well location in Tables 5.3-1 through 5.3-5. Figure 5.3-1 presents tritium activity profiles for all samples collected during April and June 2010. Results obtained for tritium during the previous three quarters (July–September 2009, October–December 2009, and January–March 2010) are also presented in Figure 5.3-1 for comparison with the current quarter data. Trends observed during

the April–June 2010 sampling period in vapor-monitoring wells 21-25262, 21-25264, 21-603058, and 21-603059 were similar to those reported during previous sampling rounds.

- Tritium activities were higher in samples collected from vapor-monitoring well 21-25264 than in samples collected from the other vapor-monitoring wells. The maximum reported tritium activity (191,459 pCi/L) was collected at port 2 (at a depth of 150.5–155.5 ft bgs) in June 2010.
- Maximum detected tritium activities in vapor-monitoring wells 21-25264 and 21-603058 occurred at intermediate-depth ports followed by a decrease to TD. Tritium activities in vapor-monitoring well 21-603058 showed an increase to 116,521 pCi/L at port 4 (approximately 250 ft bgs) in November 2009. The January–March and April–June 2010 sampling periods showed consistently similar or lower tritium activities than reported from previous sampling rounds for each of these vapor-monitoring wells.
- Tritium activities in vapor-monitoring well 21-603059 generally increased with depth to TD. This trend was consistent with all tritium data reported from the July 2009–June 2010 sampling period except from the December 2009 data. In December 2009, tritium activities reached a maximum (23,765 pCi/L) at approximately 250 ft bgs, followed by a decrease to TD.
- The maximum detected tritium activity in vapor-monitoring well 21-25262 occurred near 375 ft bgs, followed by an immediate decrease to TD.
- The maximum tritium activities in vapor-monitoring well 21-607955 were detected at two depths, at approximately 160 ft bgs and 230 ft bgs, followed by a decrease to lower or nondetect values at ports 9 and 10 (654 and 800 ft bgs, respectively). The exception was an increase at approximately 330 ft bgs from the January 2010 sample round at port 5, with a reported activity of 24,955 pCi/L. Tritium detections in vapor-monitoring well 21-607955 at TD showed consistently low activity values of less than 850 pCi/L.

## 6.0 SUMMARY

The objectives of the MDA T vapor-monitoring activities are (1) to collect additional vapor samples from vapor-monitoring wells at MDA T and (2) to compare the results with previously detected VOC concentrations and tritium activities beneath MDA T. The results of the current quarter of monitoring activities (April–June 2010) indicated similar trends to those reported during previous monitoring activities (October 2007–December 2009) (LANL 2009, 105187; LANL 2009, 106665; LANL 2009, 107448; LANL 2010, 108529; LANL 2010 109254; LANL 2010 110059).

A total of 24 VOCs and tritium were detected in the pore gas beneath MDA T. Concentrations for most VOCs detected in MDA T pore gas decreased with depth, were consistently detected at or near the SQL, or were infrequently detected. Methylene chloride, carbon tetrachloride, chloroform, TCE, and PCE were consistently detected throughout the MDA T monitoring period at the greatest concentrations relative to the other detected VOCs. Methylene chloride, tetrachloroethene, and 1,1,2-trichloroethane had SVs greater than 1.0; however, all TD samples that resulted in an SV greater than 1.0 were from intermediate-depth wells (21-25264, 21-603058, and 21-603059) and not from the two deep wells (21-25262 and 21-607955). Therefore, the current VOC concentrations detected at MDA T were not high enough to result in groundwater contamination above applicable regulatory criteria. A summary of the five VOCs and other VOCs of interest (e.g., acetone, toluene, and 1,1,2-trichloethane) is given below.

- Methylene chloride pore-gas concentrations consistently increased with depth to TD in intermediate vapor-monitoring wells 21-25264, 21-603058, and 21-603059. In deep vapor-

monitoring wells 21-25262 and 21-607955, methylene chloride concentrations increased with depth to a maximum at approximately 350–575 ft bgs before decreasing with depth to TD.

- Carbon tetrachloride pore-gas concentrations increased with depth in vapor-monitoring wells 21-25262, 21-25264, 21-603058, 21-603059 and 21-607955 to approximately 250–350 ft bgs; below approximately 350 ft bgs, carbon tetrachloride decreased with depth to TD, except at vapor-monitoring well 21-603058 where TD concentrations remained generally constant.
- Chloroform and TCE pore-gas concentrations generally showed an S-shaped profile in vapor-monitoring well 21-25262 where the concentrations were higher near the surface and lower-middle ports, and lowest in the upper-middle ports and at TD. Chloroform concentrations in vapor-monitoring well 21-25264 generally increased with depth, and TCE concentrations showed a decrease at approximately 150 ft bgs and remained generally constant to TD. At vapor-monitoring-well 21-603058 TCE concentrations increased with depth to 250 ft bgs then remained constant to TD, and at vapor-monitoring well 21-603059 TCE, concentrations generally increased with depth. At vapor-monitoring-well 21-603058, chloroform concentrations increased with depth to TD, and at vapor-monitoring well 21-603059, chloroform concentrations generally decreased with depth, but the results were less consistent between rounds. In deep vapor-monitoring well 21-607955, chloroform and TCE concentrations increased with depth to approximately 350 ft bgs and decreased to low concentrations or nondetections from approximately 700 ft bgs to TD.
- PCE concentrations consistently decreased with depth to TD in all five vapor-monitoring wells.
- Acetone and toluene were detected at their maximum concentrations at TD (approximately 950 ft bgs) during the initial round of pore-gas sampling in vapor-monitoring well 21-607955 in early December 2009 (concentrations of 30,000 $\mu g/m^3$ and 690 $\mu g/m^3$, respectively). In subsequent rounds of pore-gas sampling at vapor-monitoring well 21-607955 (January–March 2010), acetone concentrations at TD were again elevated relative to shallower depths, but at a considerably lower concentration than the first round (maximum concentration of 99 $\mu g/m^3$ in the March 2010 sampling round). Concentrations detected in April 2010 (8.8 $\mu g/m^3$ and 15 $\mu g/m^3$ at 650 and 950 ft bgs, respectively) were the lowest reported to date. Acetone was not detected in vapor-monitoring well 21-607955 in June 2010. Toluene was also detected at TD at elevated concentrations relative to shallower depths in both the January–March and April–June 2010 rounds (maximum concentration of 500 $\mu g/m^3$ and 300 $\mu g/m^3$, respectively). Acetone and toluene were present at TD but at concentrations well below SVs. The higher concentration of acetone from the first sampling round was likely an anomaly.
- Trichloroethane(1,1,2-) concentrations increased with depth from approximately 225 ft bgs to TD (375 ft bgs) in vapor-monitoring well 21-603059 and to approximately 475 ft bgs (port 7) in vapor-monitoring well 21-25262, then decreased to TD (690 ft bgs).1,1,2-trichloroethane was detected at low concentrations in vapor-monitoring wells 21-25264, 21-603058, and 21-607955.

Consistent with previous results, tritium activities were substantially higher in samples collected from vapor-monitoring well 21-25264 than in samples collected from vapor-monitoring wells 21-25262, 21-603058, 21-603059, and 21-607955 (except during the November 2009 sampling period, when vapor-monitoring well 21-603058 showed an increase at approximately 250 ft bgs (116,521 pCi/L). Tritium activities in vapor-monitoring wells 21-25264, 21-603058, and 21-25262 had one or two maximum detected activities at intermediate depths, followed by a marked decrease to TD. Intermediate vapor-monitoring well 21-603059 showed an increase in tritium activities to TD. In vapor-monitoring well 21-607955, tritium activities showed a maximum at shallow to intermediate depths with consistently lower detections at TD (all below 850 pCi/L).

Quarterly vapor-monitoring activities are scheduled to continue at MDA T per the requirements outlined in the approved MDA T Phase III investigation work plan (LANL 2009, 105645; NMED 2009, 106455; NMED 2009, 105691) and the NMED approval with modifications (NMED 2010, 109021).

## 7.0 REFERENCES AND MAP DATA SOURCES

### 7.1 References

*The following list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.*

*Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.*

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LANL (Los Alamos National Laboratory), July 2009. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area T, Consolidated Unit 21-016(a)-99, at Technical Area 21, February and April 2009," Los Alamos National Laboratory document LA-UR-09-4674, Los Alamos, New Mexico. (LANL 2009, 106665)

LANL (Los Alamos National Laboratory), October 2009. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area T, Consolidated Unit 21-016(a)-99, at Technical Area 21, June to August 2009," Los Alamos National Laboratory document LA-UR-09-6878, Los Alamos, New Mexico. (LANL 2009, 107448)

LANL (Los Alamos National Laboratory), January 2010. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area T, Consolidated Unit 21-016(a)-99, at Technical Area 21, September to November 2009," Los Alamos National Laboratory document LA-UR-10-0409, Los Alamos, New Mexico. (LANL 2010, 108529)

LANL (Los Alamos National Laboratory), April 2010. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area T, Consolidated Unit 21-016(a)-99, at Technical Area 21, October to December 2009," Los Alamos National Laboratory document LA-UR-10-2421, Los Alamos, New Mexico. (LANL 2010, 109254)

LANL (Los Alamos National Laboratory), July 2010. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area T, Consolidated Unit 21-016(a)-99, at Technical Area 21, January to March 2010," Los Alamos National Laboratory document LA-UR-10-3952, Los Alamos, New Mexico. (LANL 2010, 110059)

NMED (New Mexico Environment Department), October 31, 2007. "Approval with Modifications, Subsurface Vapor-Monitoring Plan for MDA T," 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 2007, 098946)

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## 7.2 Map Data Sources

Data sources used in original figures created for this report are described below and identified by legend title.

| Legend Item/Type | Data Source |
|---|---|
| Rio Grande | Drainage Arcs; Los Alamos National Laboratory; Water Quality and Hydrology Group; 03 June 2003 |
| LANL boundary | LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007. |
| TA boundary | Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007. |
| NES boundary | Nuclear Environmental Sites (NES); Los Alamos National Laboratory, EP Environment and Remediation Support Services Division, EP2006-1092; 1:2,500 Scale Data; 11 January 2007. |
| Major paved road | New Mexico Roads; Earth Data Analysis Center, Albuquerque, NM; 01 December1995. |
| Paved road | Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 04 January 2008. |
| Structure | Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 04 January 2008. |
| Former structure | Former Structures; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2008-0441; 1:2,500 Scale Data; 08 August 2008. |
| Waste storage features | Waste Storage Features; Los Alamos National Laboratory, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2007-0032; 1:2,500 Scale Data; 13 April 2007. |
| Contours | Hypsography, 100-, 20-, and 10-Ft Contour Intervals; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991. |
| Fence | Security and Industrial Fences and Gates; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. |
| Revised MDA T fence | Revised MDA T Fencing; Los Alamos National Laboratory, Waste and Environmental Services Division, unpublished data, personal communication with N. Plannerer. |
| Gas line | Primary Gas Distribution Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. |
| Water line | Water Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. |
| Electric line | Primary Electric Grid; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. |
| Sewer line | Sewer Line System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. |
| Steam line | Steam Line Distribution System; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. |
| Communication line | Communication Lines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 28 May 2009. |
| Building-associated features /structures | Primary Landscape Features; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. |
| Sampling locations | Point Feature Locations of the Environmental Restoration Project Database; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2008-0109; 4 June 2009. |

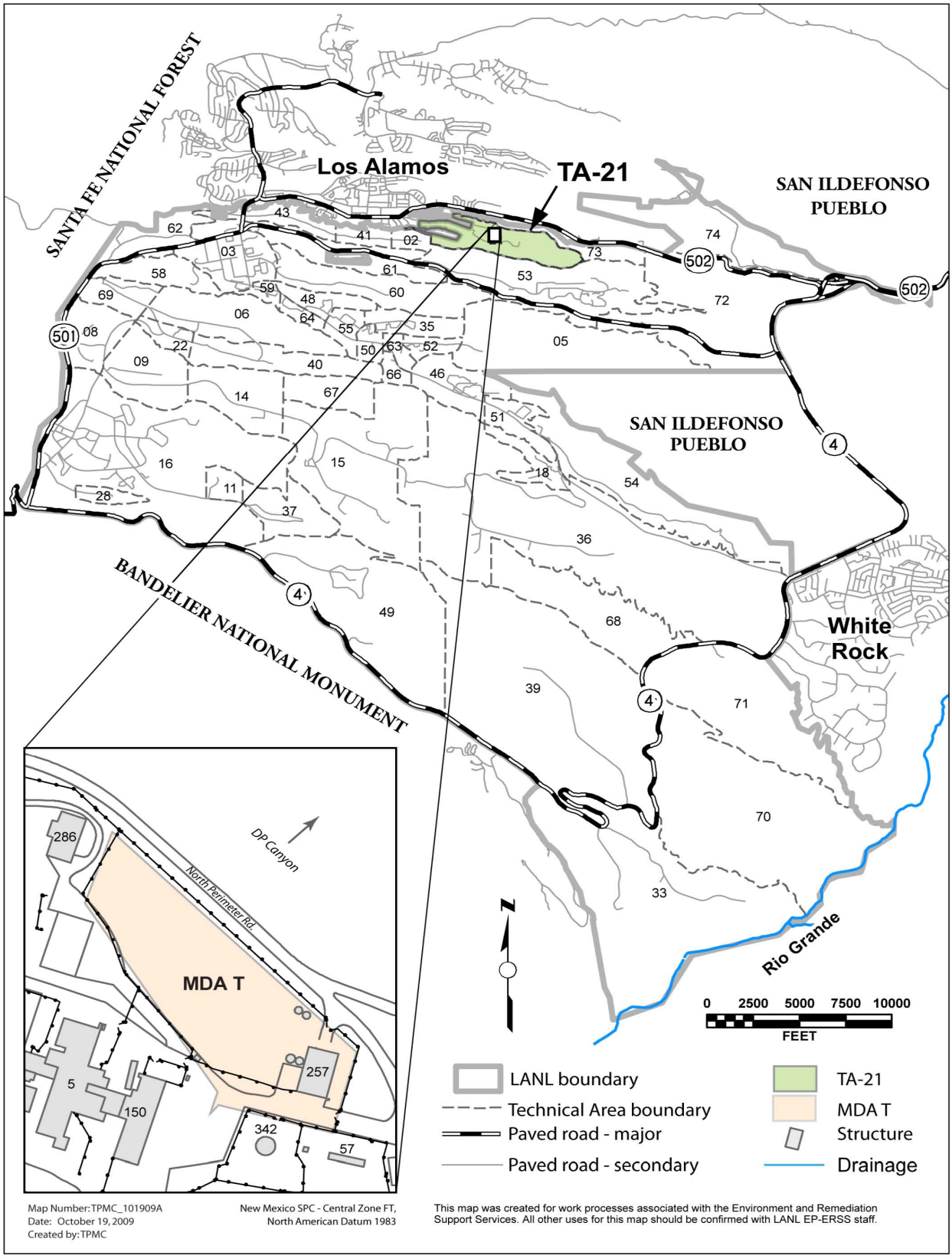



**Figure 1.1-1 Location of MDA T at TA-21**

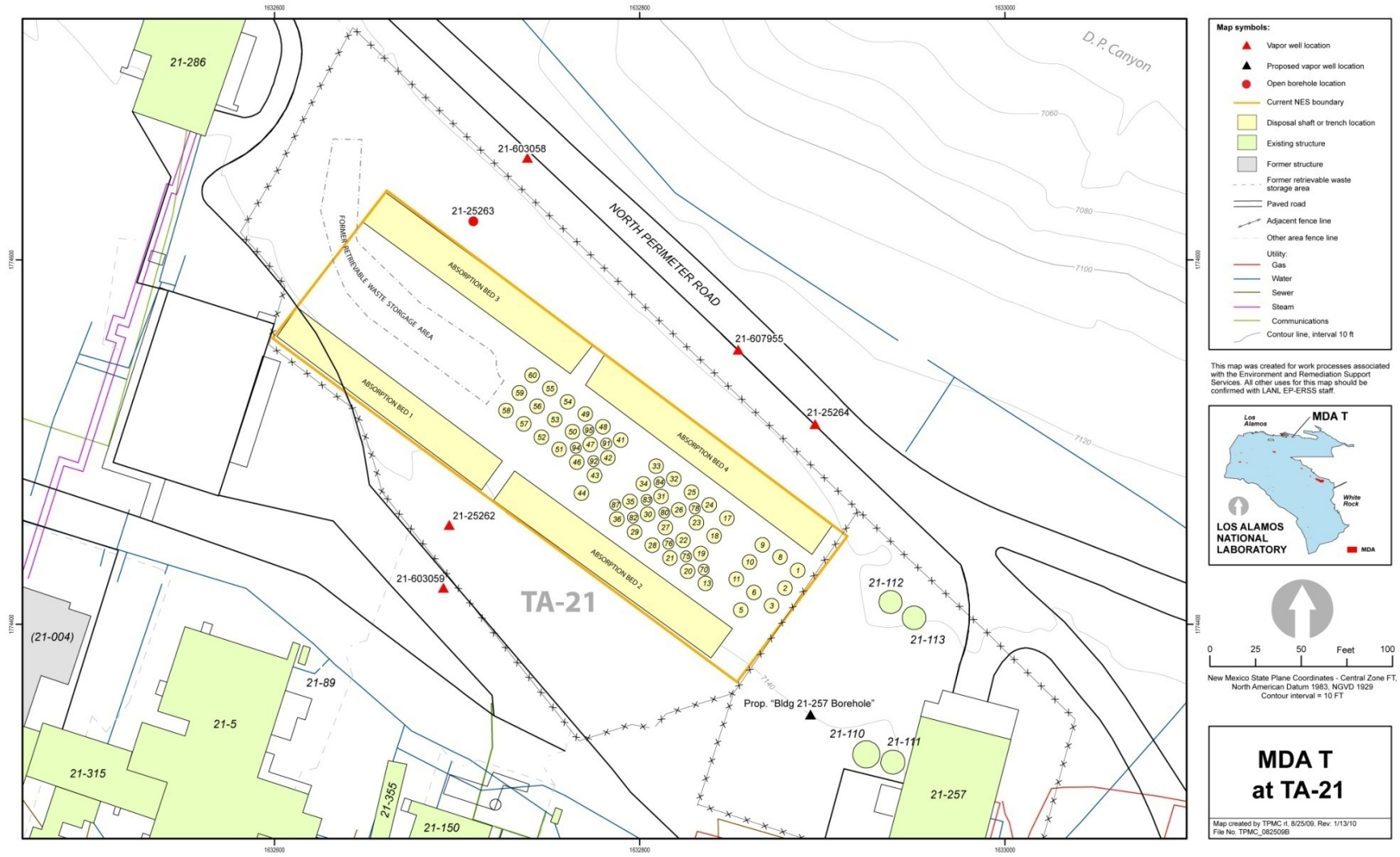



**Figure 1.1-2 Locations of MDA T vapor-monitoring wells and associated structures and features**

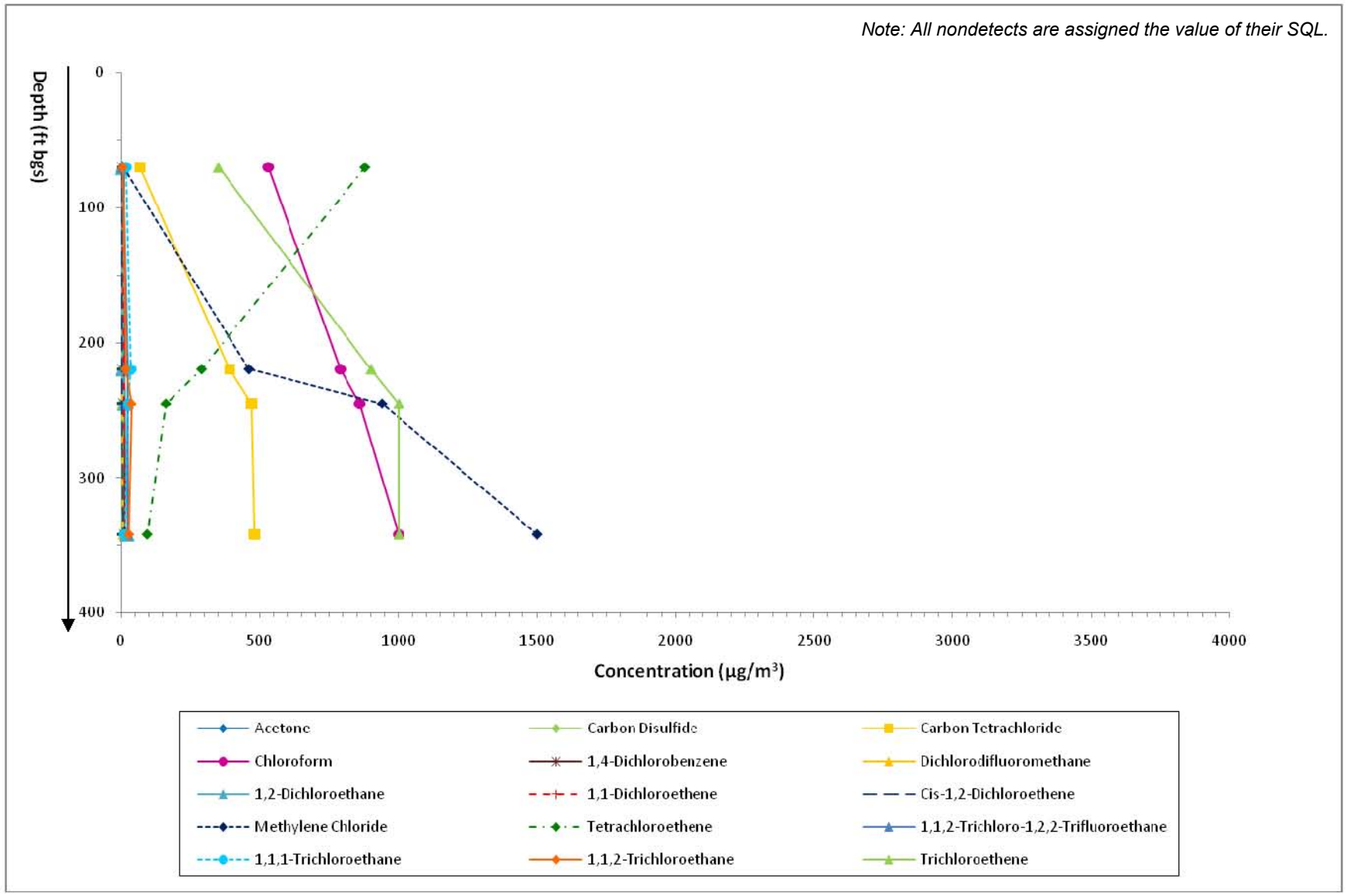



**Figure 5.1-1 Vertical profile of detected VOCs in vapor-monitoring well 21-603058, April 2010**

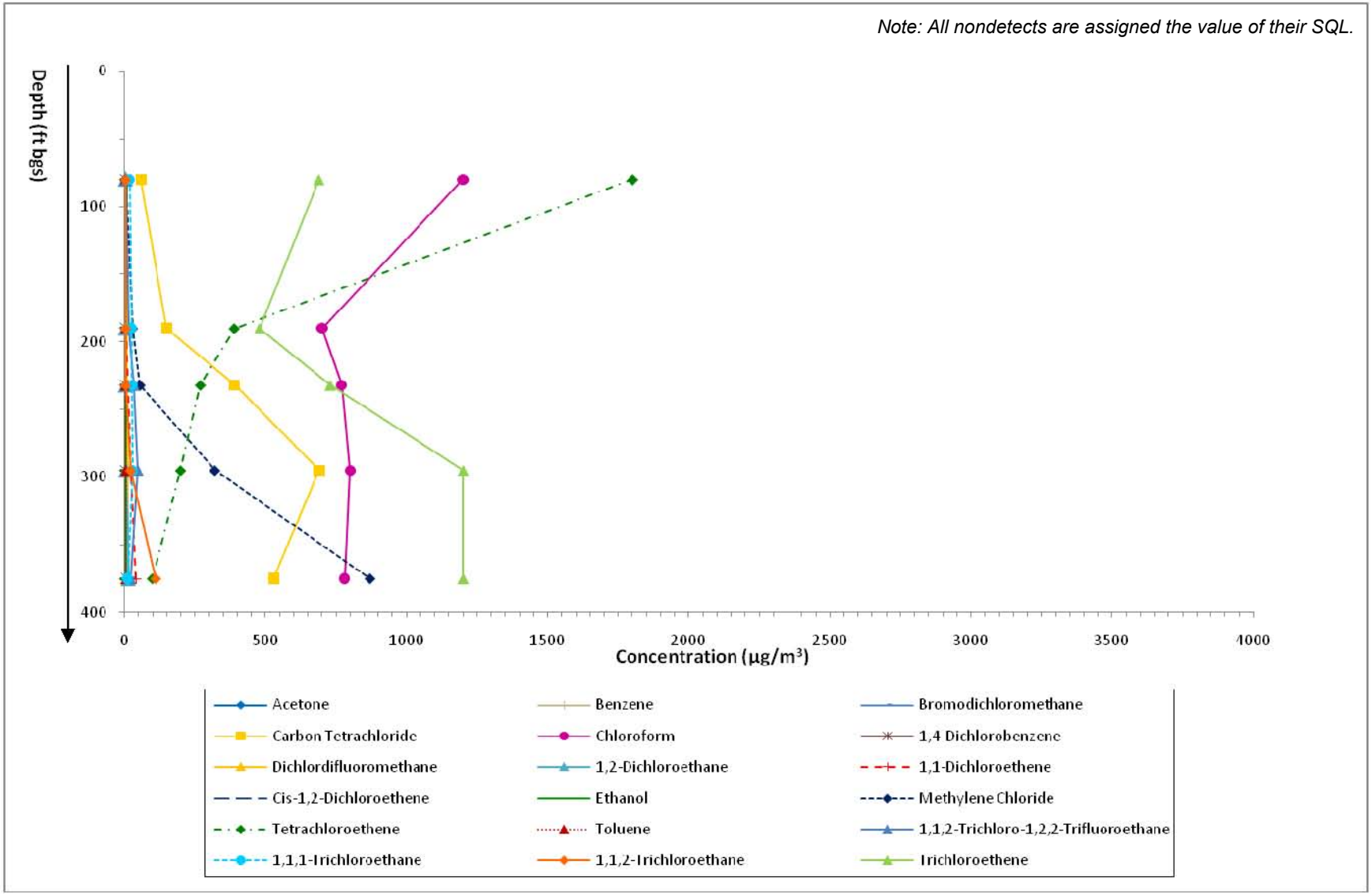



**Figure 5.1-2 Vertical profile of detected VOCs in vapor-monitoring well 21-603059, April 2010**

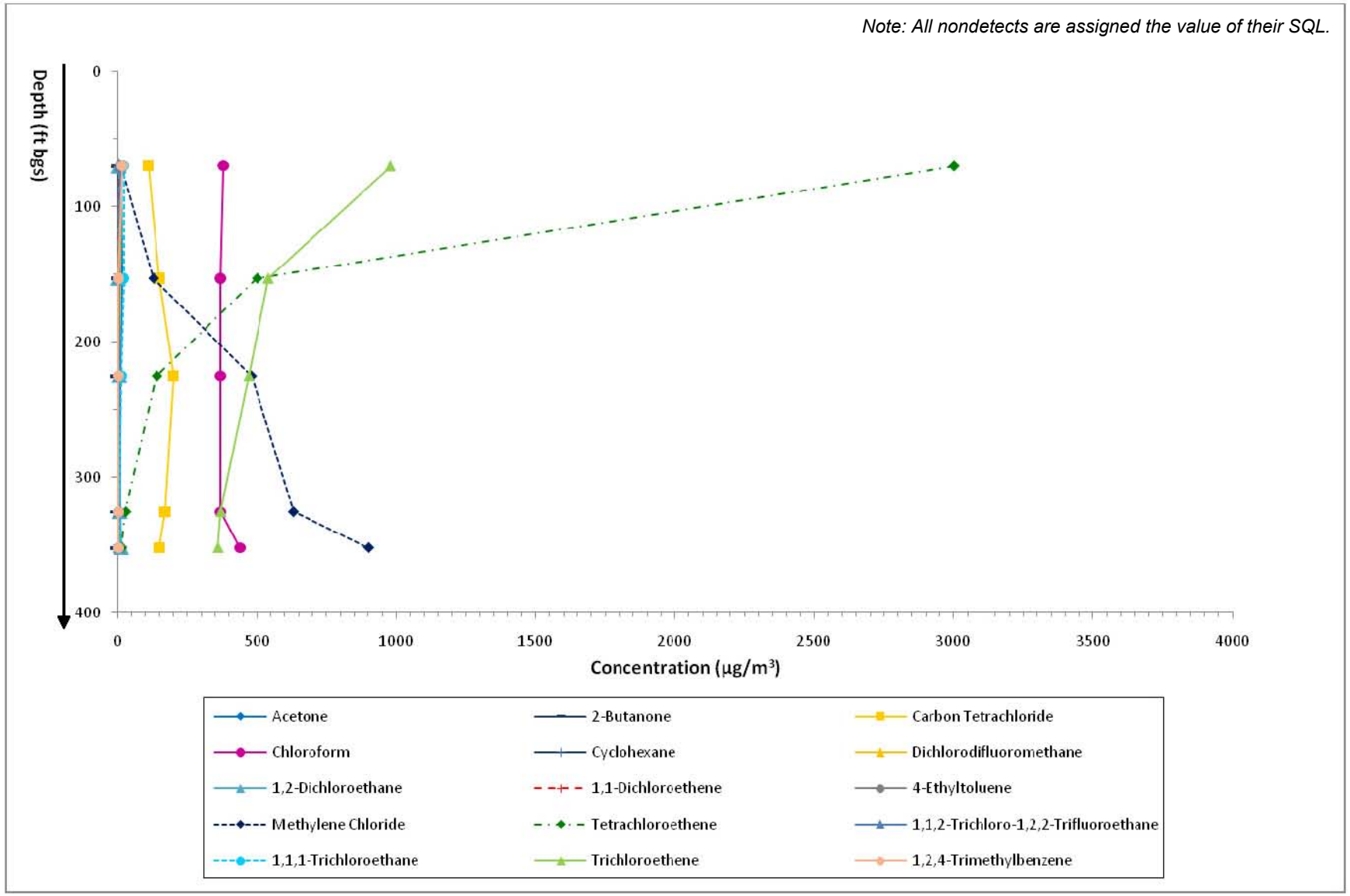



**Figure 5.1-3 Vertical profile of detected VOCs in vapor-monitoring well 21-25264, April 2010**

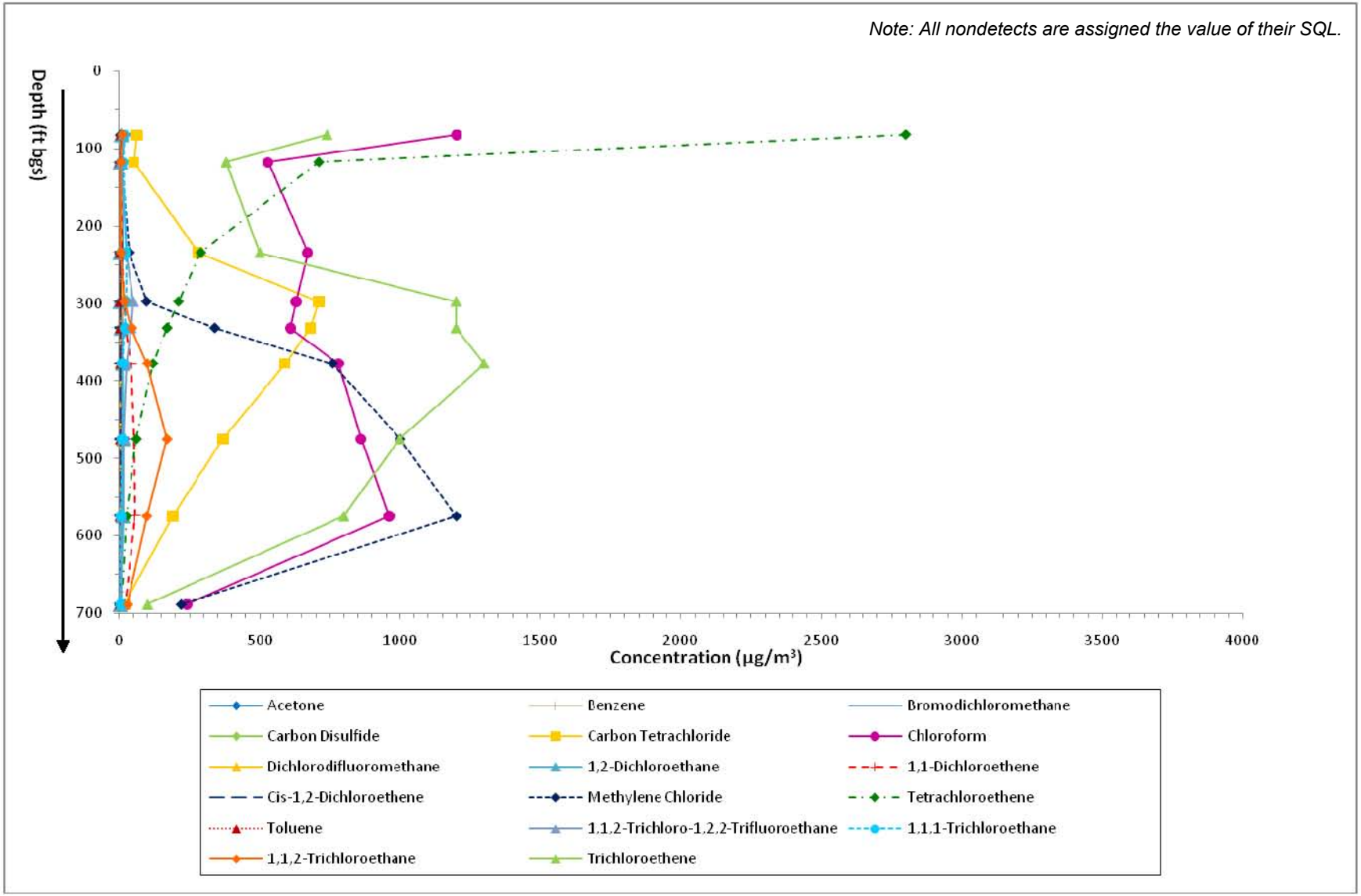



**Figure 5.1-4 Vertical profile of detected VOCs in vapor-monitoring well 21-25262, April 2010**

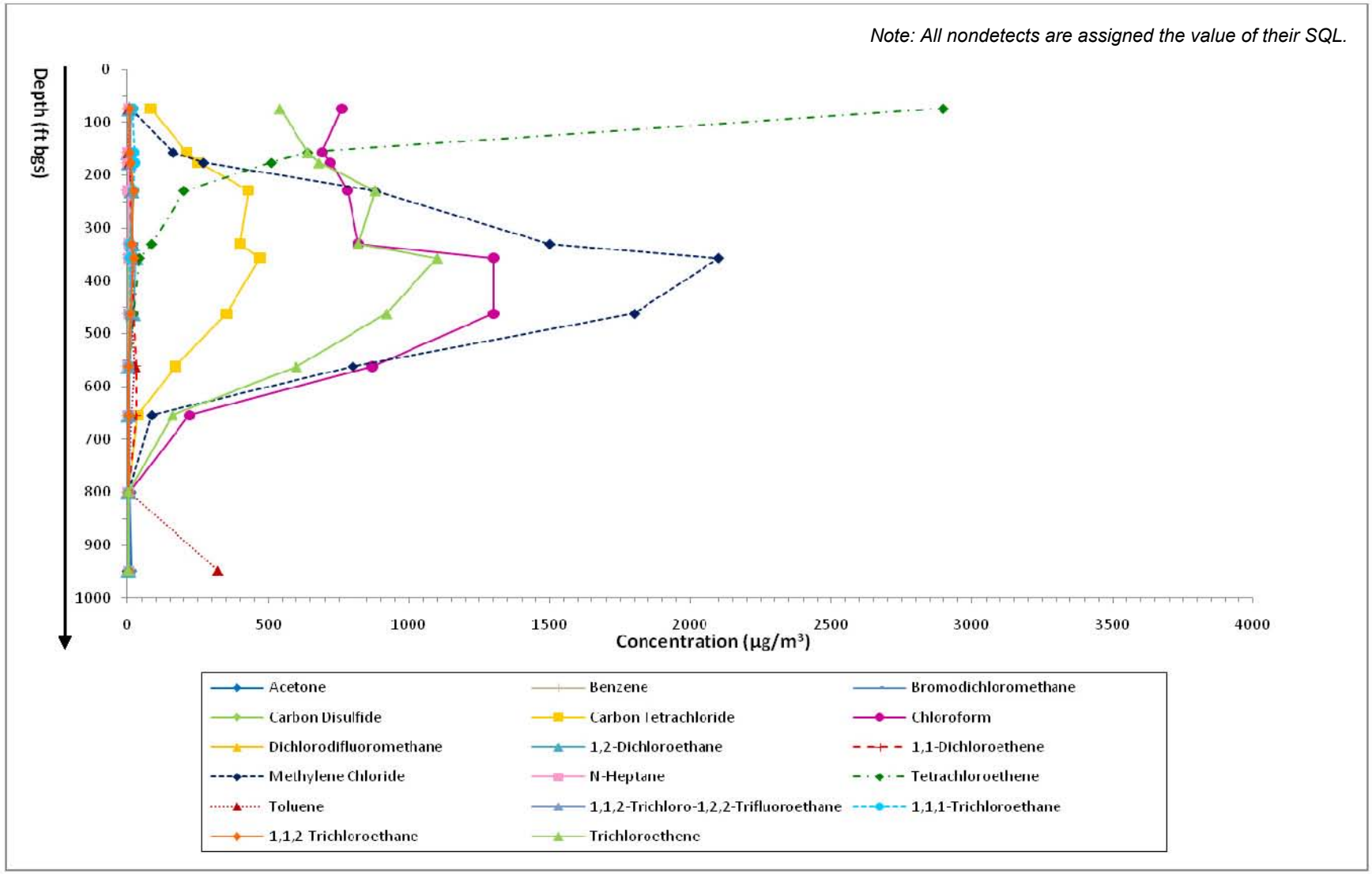



**Figure 5.1-5 Vertical profile of detected VOCs in vapor-monitoring well 21-607955, April 2010**

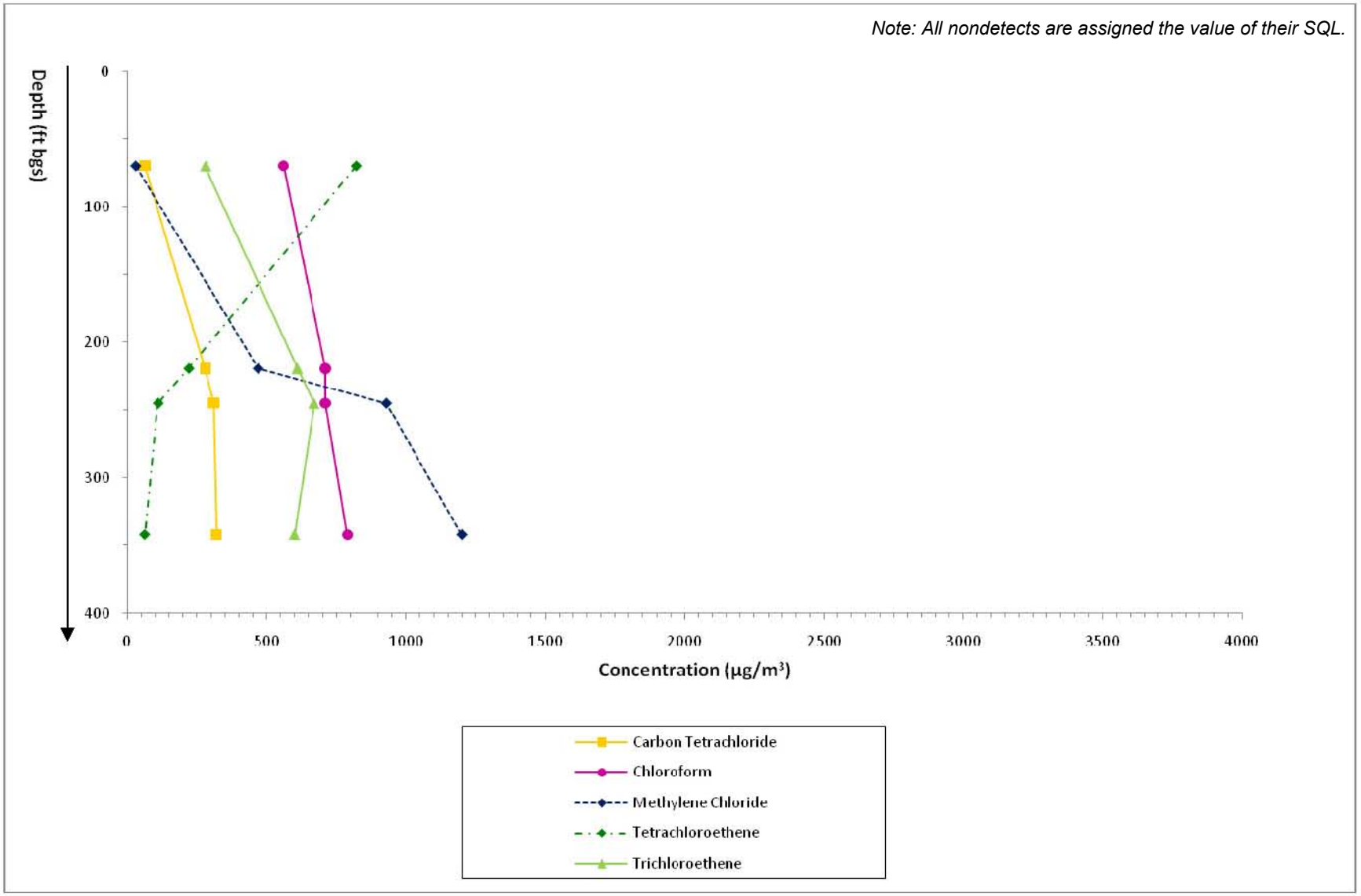



**Figure 5.1-6 Vertical profile of detected VOCs in vapor-monitoring well 21-603058, June 2010**

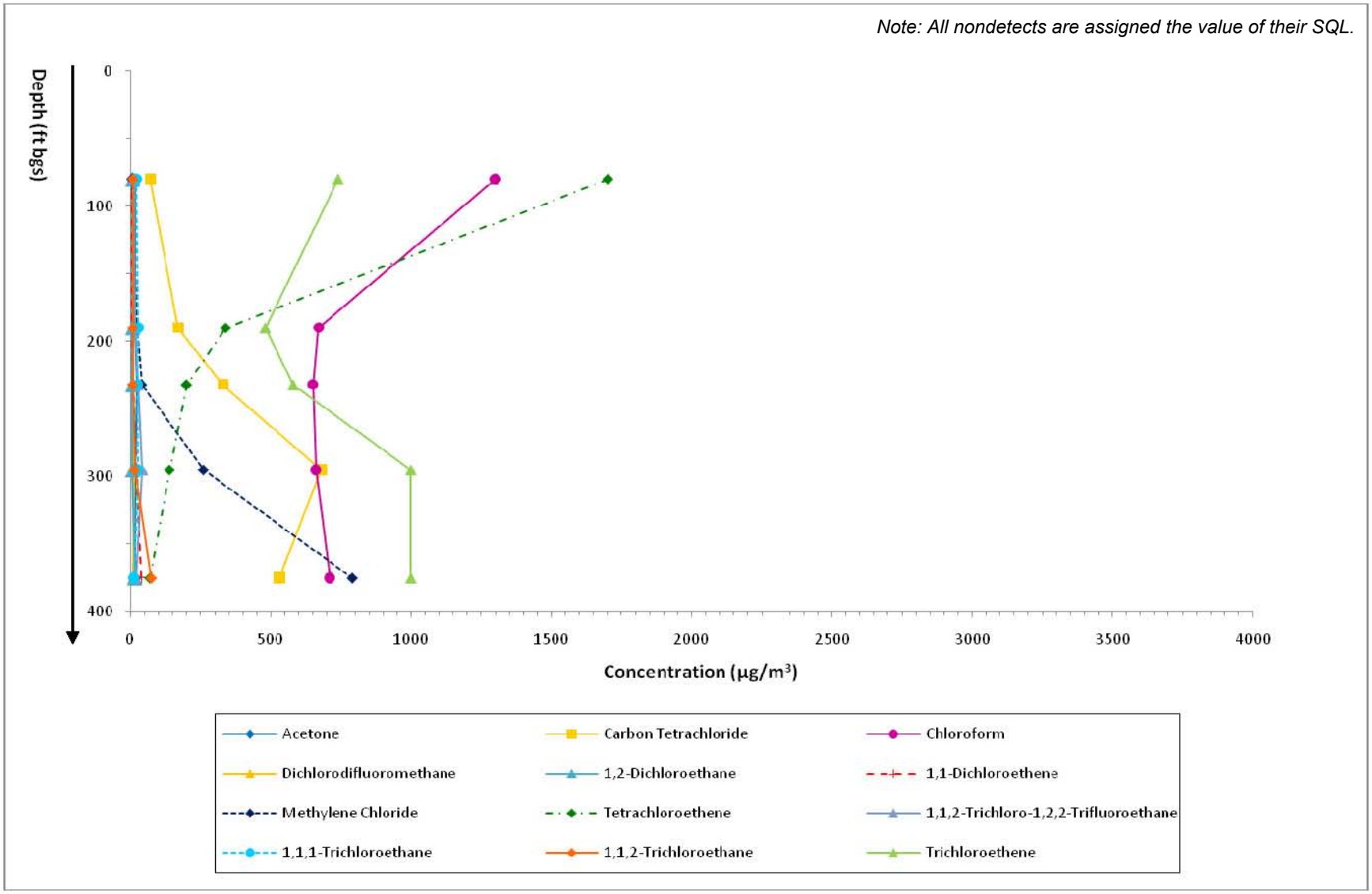



**Figure 5.1-7 Vertical profile of detected VOCs in vapor-monitoring well 21-603059, June 2010**

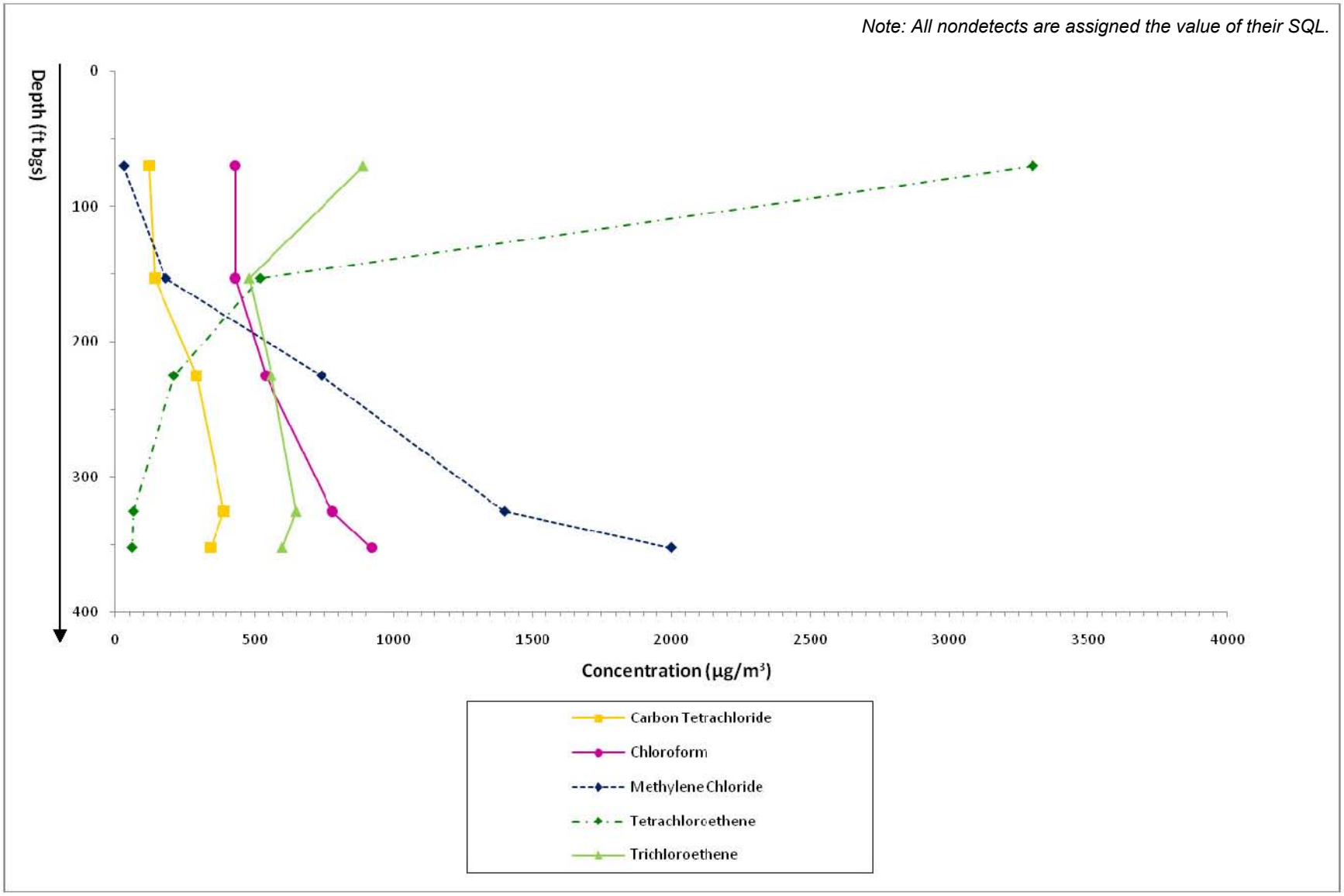



**Figure 5.1-8 Vertical profile of detected VOCs in vapor-monitoring well 21-25264, June 2010**

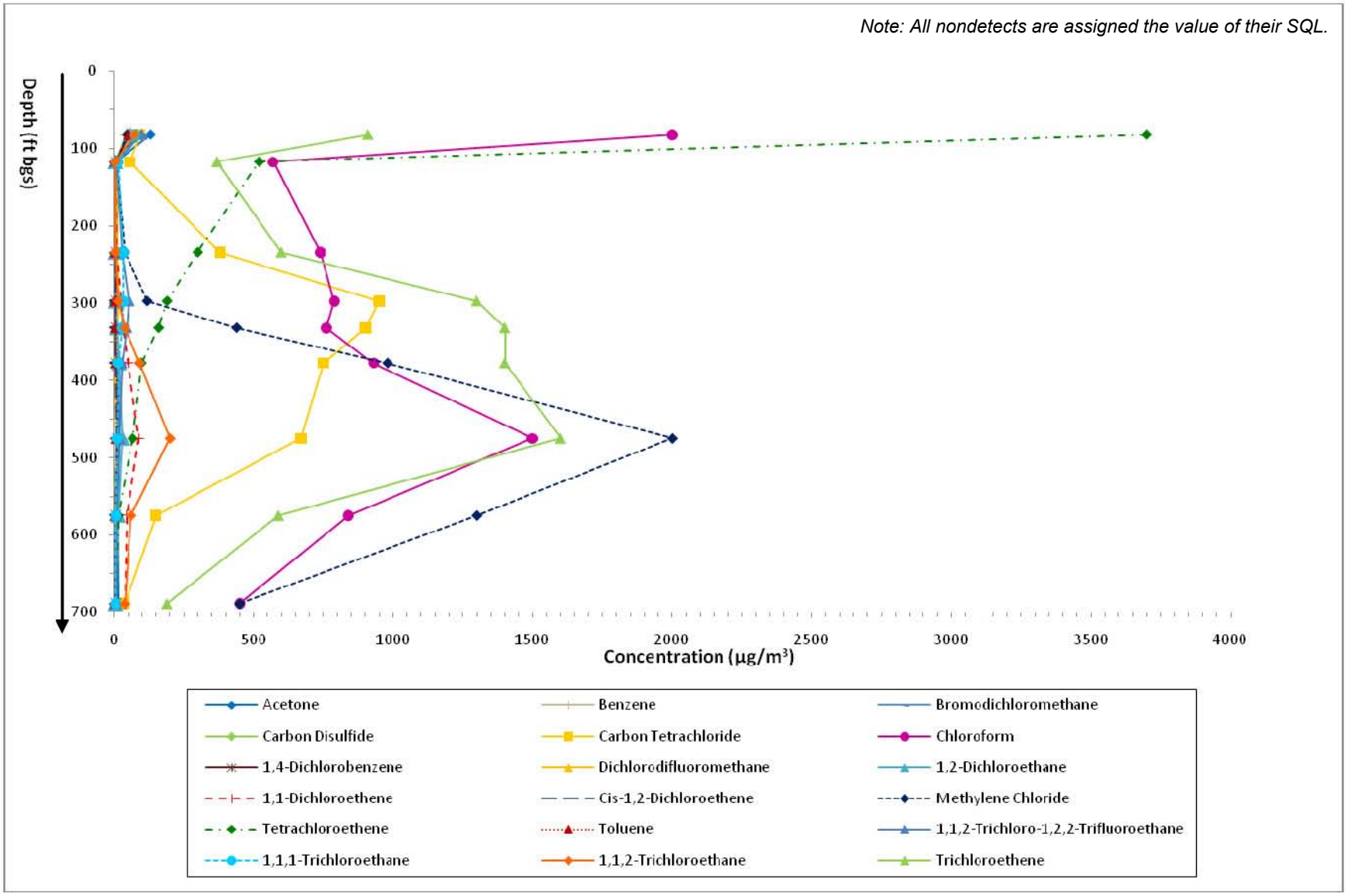



**Figure 5.1-9 Vertical profile of detected VOCs in vapor-monitoring well 21-25262, June 2010**

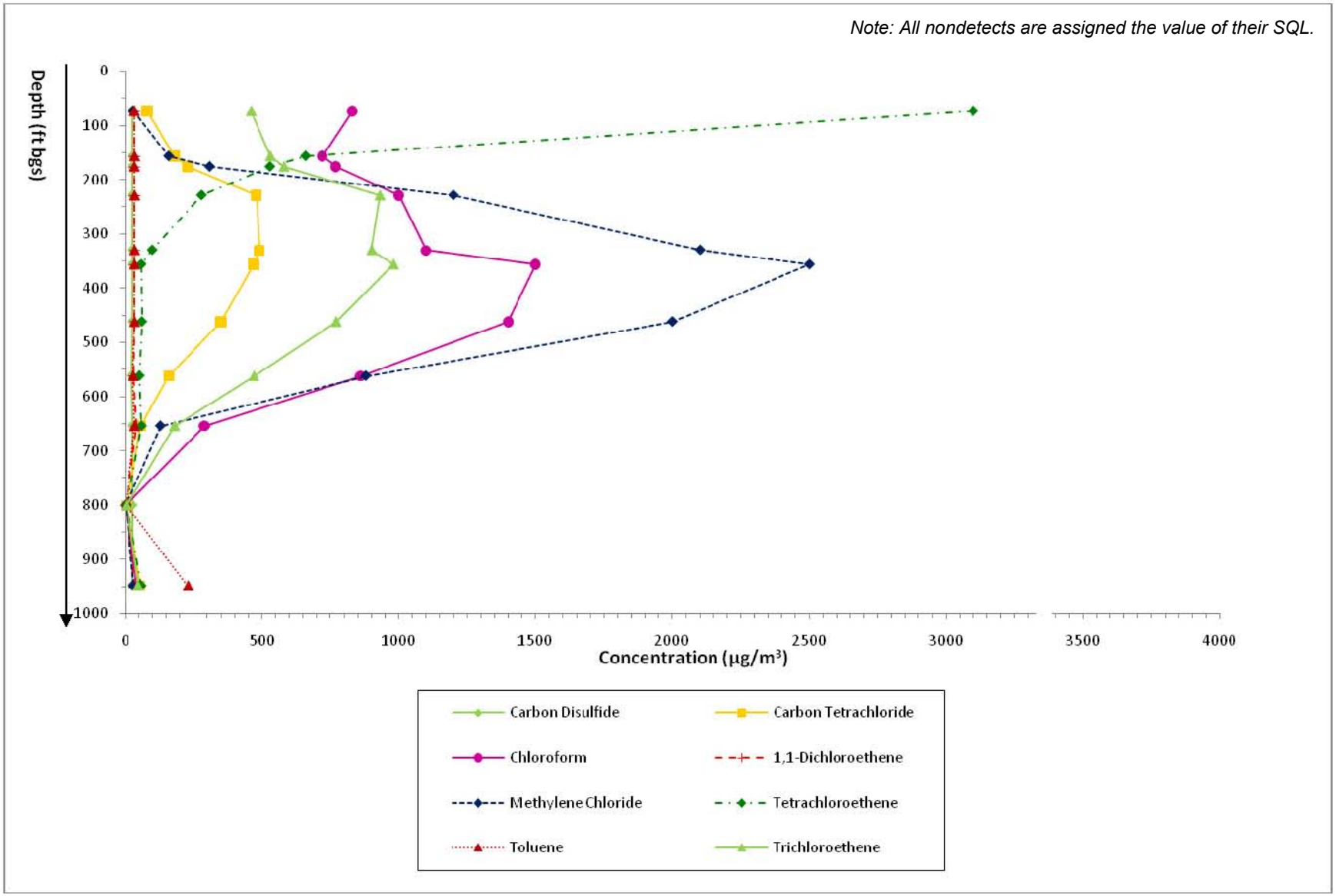



**Figure 5.1-10 Vertical profile of detected VOCs in vapor-monitoring well 21-607955, June 2010**

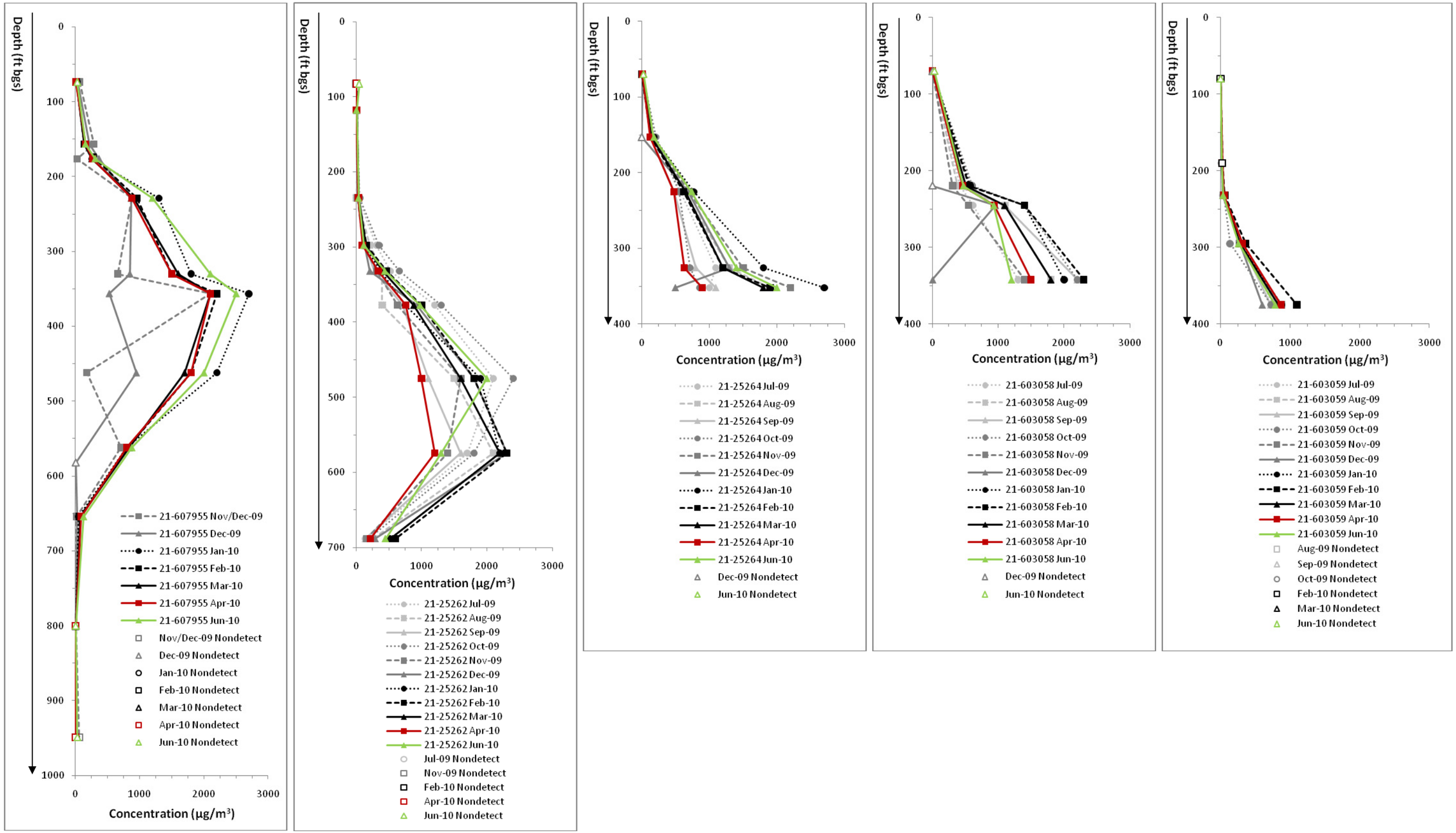



**Figure 5.1-11 Vertical profile of methylene chloride in vapor-monitoring wells 21-607955, 21-25262, 21-25264, 21-603058, and 21-603059, July 2009–June 2010**

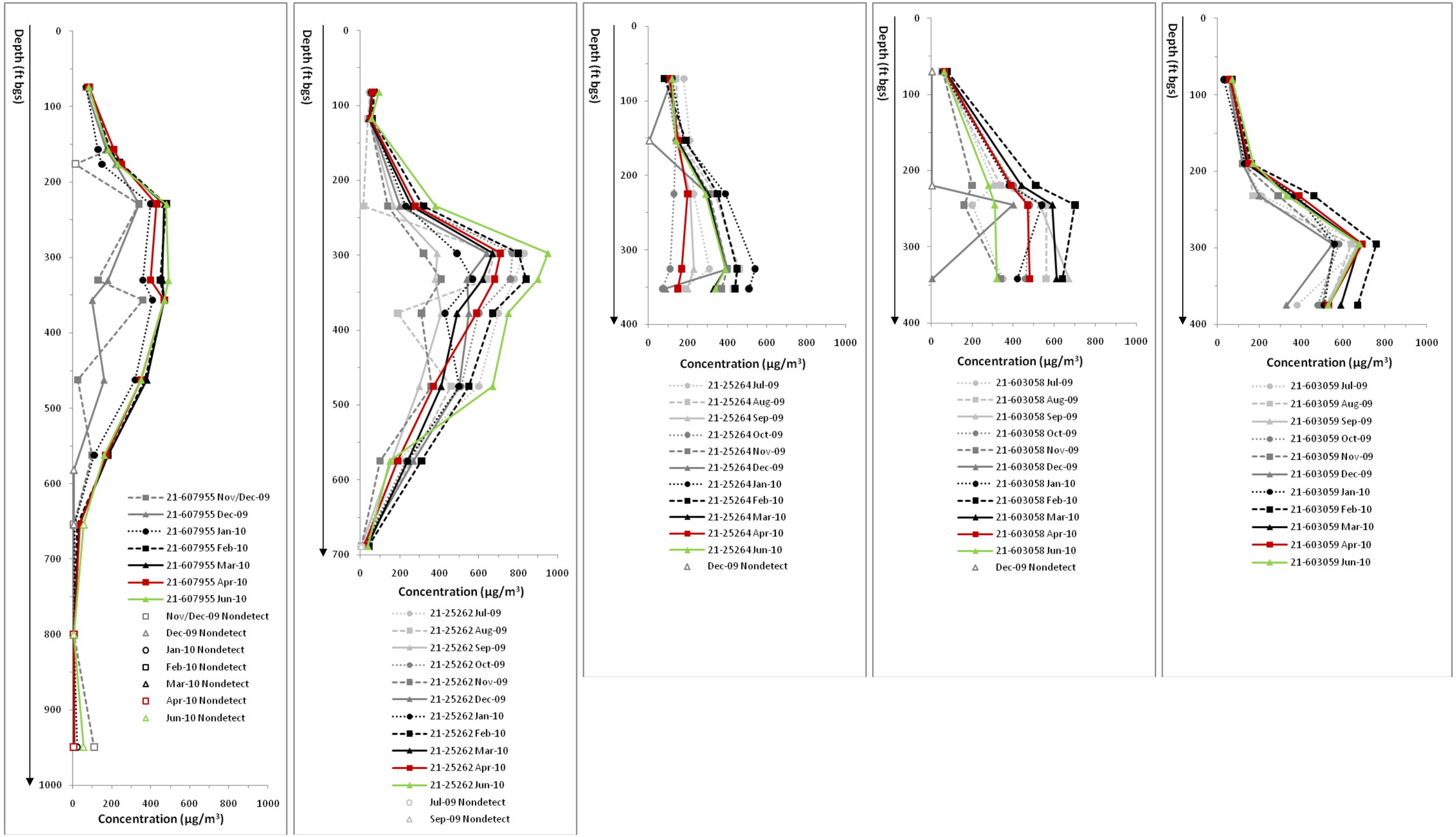



**Figure 5.1-12 Vertical profile of carbon tetrachloride in vapor-monitoring wells 21-607955, 21-25262, 21-25264, 21-603058, and 21-603059, July 2009–June 2010**

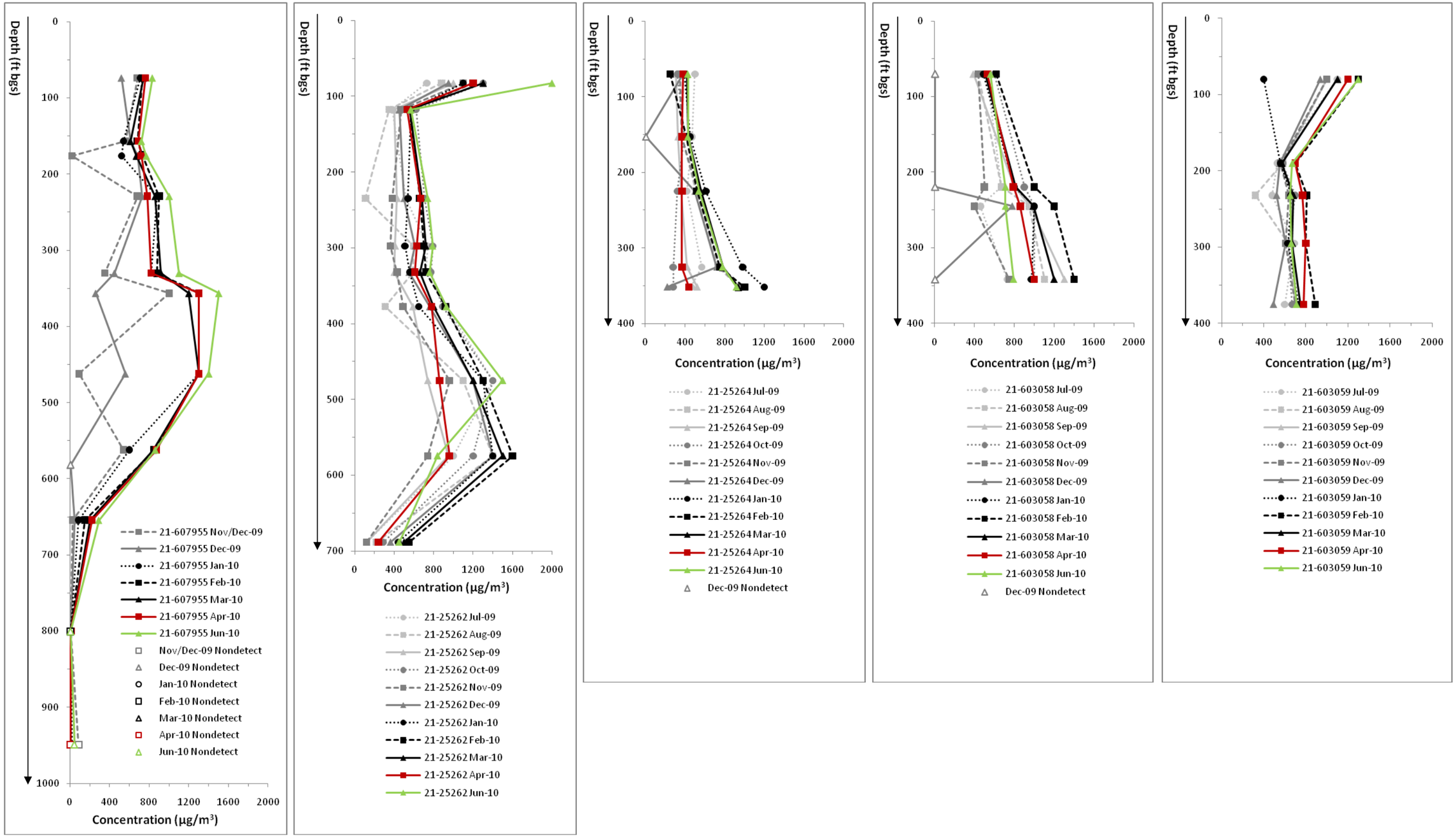



**Figure 5.1-13 Vertical profile of chloroform in vapor-monitoring wells 21-607955, 21-25262, 21-25264, 21-603058, and 21-603059, July 2009–June 2010**

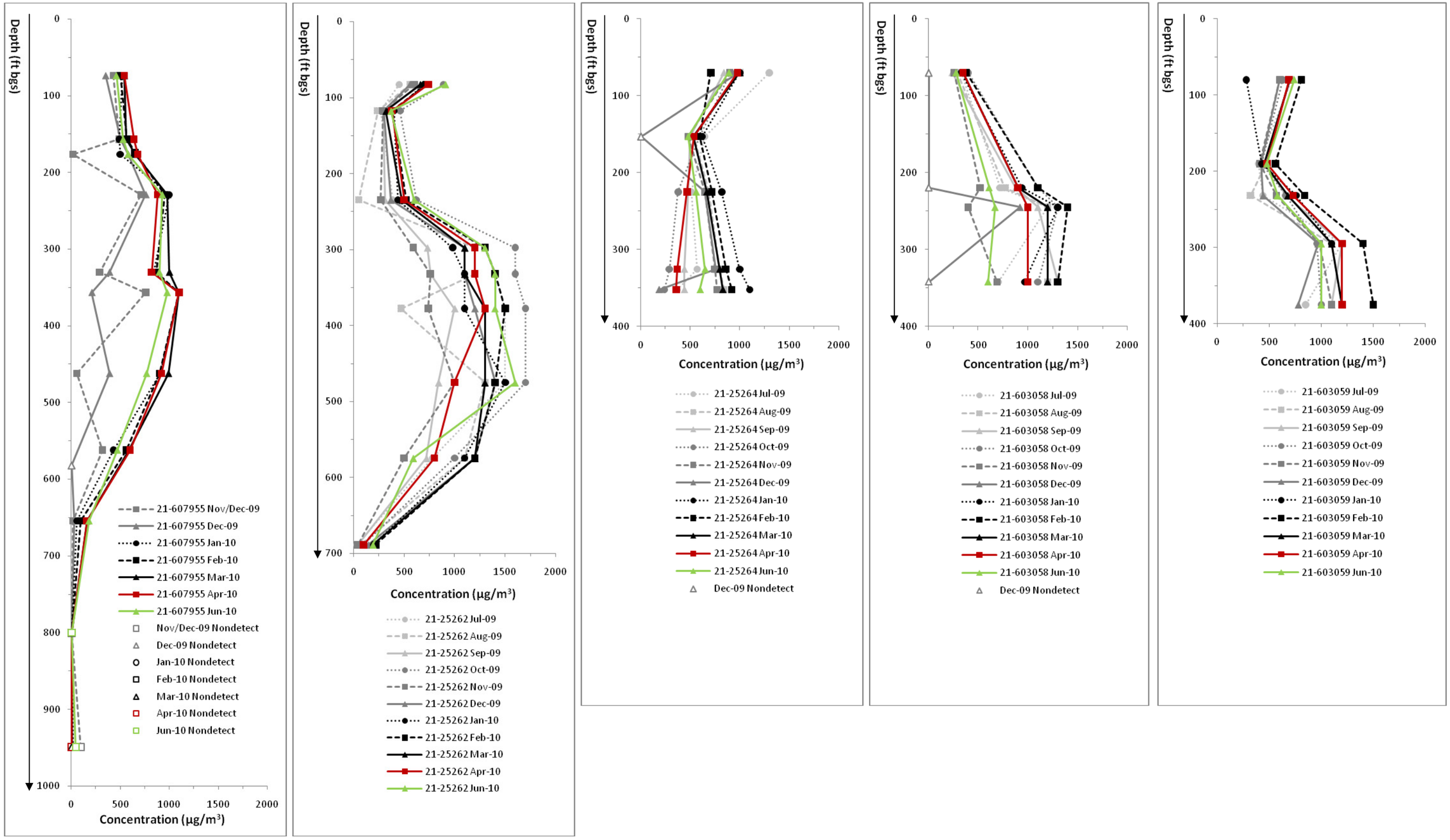



**Figure 5.1-14 Vertical profile of TCE in vapor-monitoring wells 21-607955, 21-25262, 21-25264, 21-603058, and 21-603059, July 2009–June 2010**

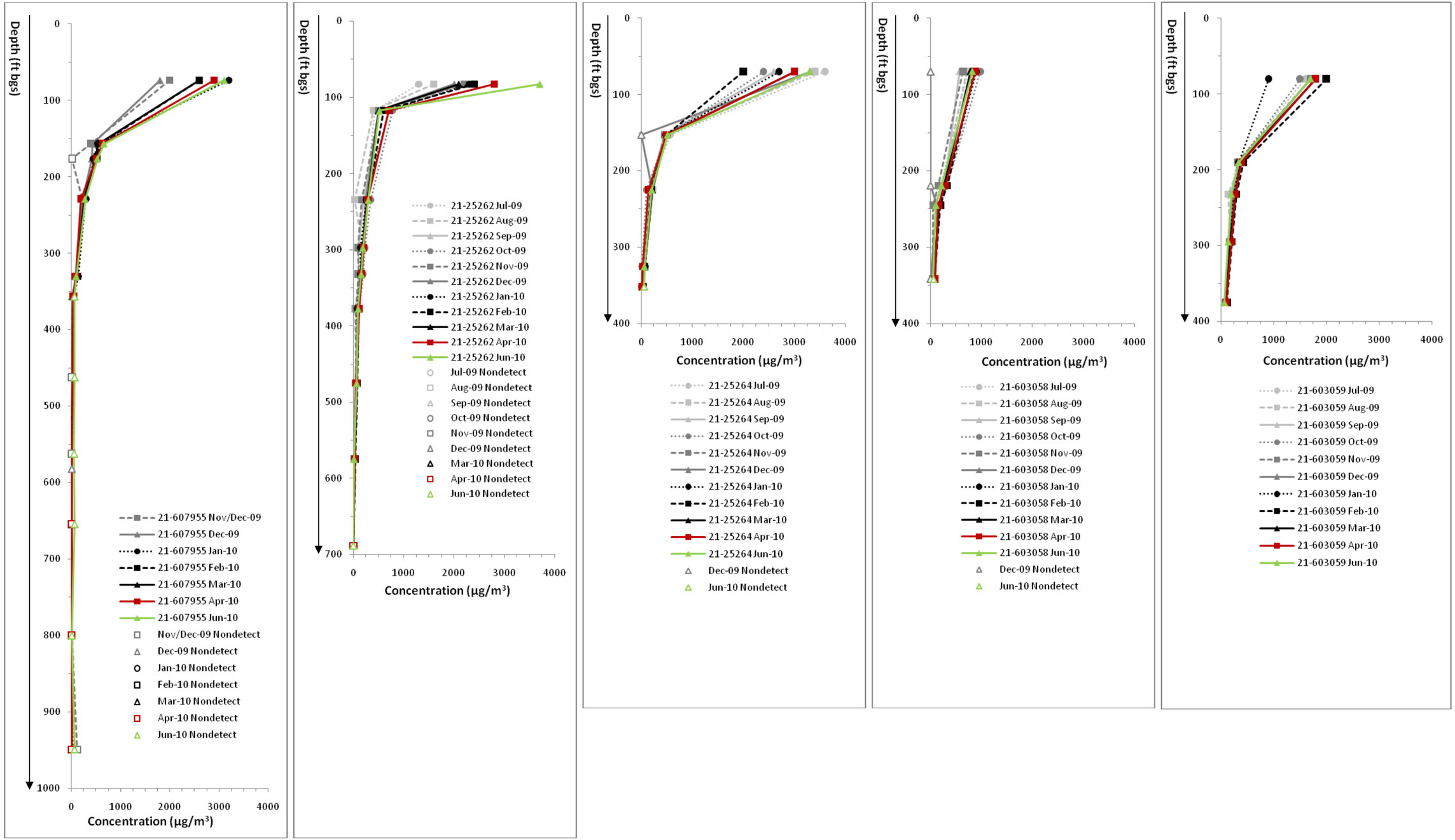
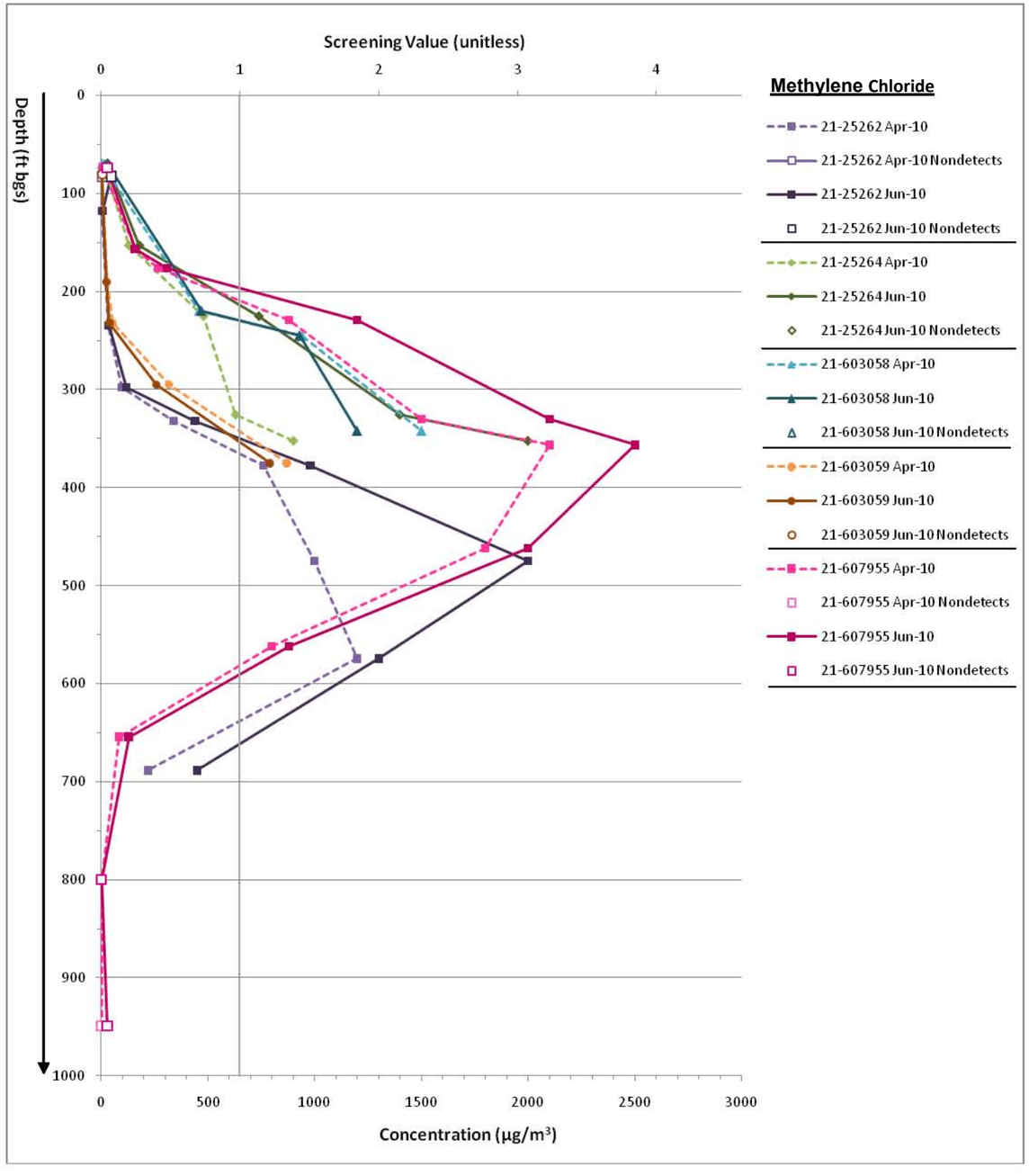



**Figure 5.1-15 Vertical profile of PCE in vapor-monitoring wells 21-607955, 21-25262, 21-25264, 21-603058, and 21-603059, July 2009–June 2010**



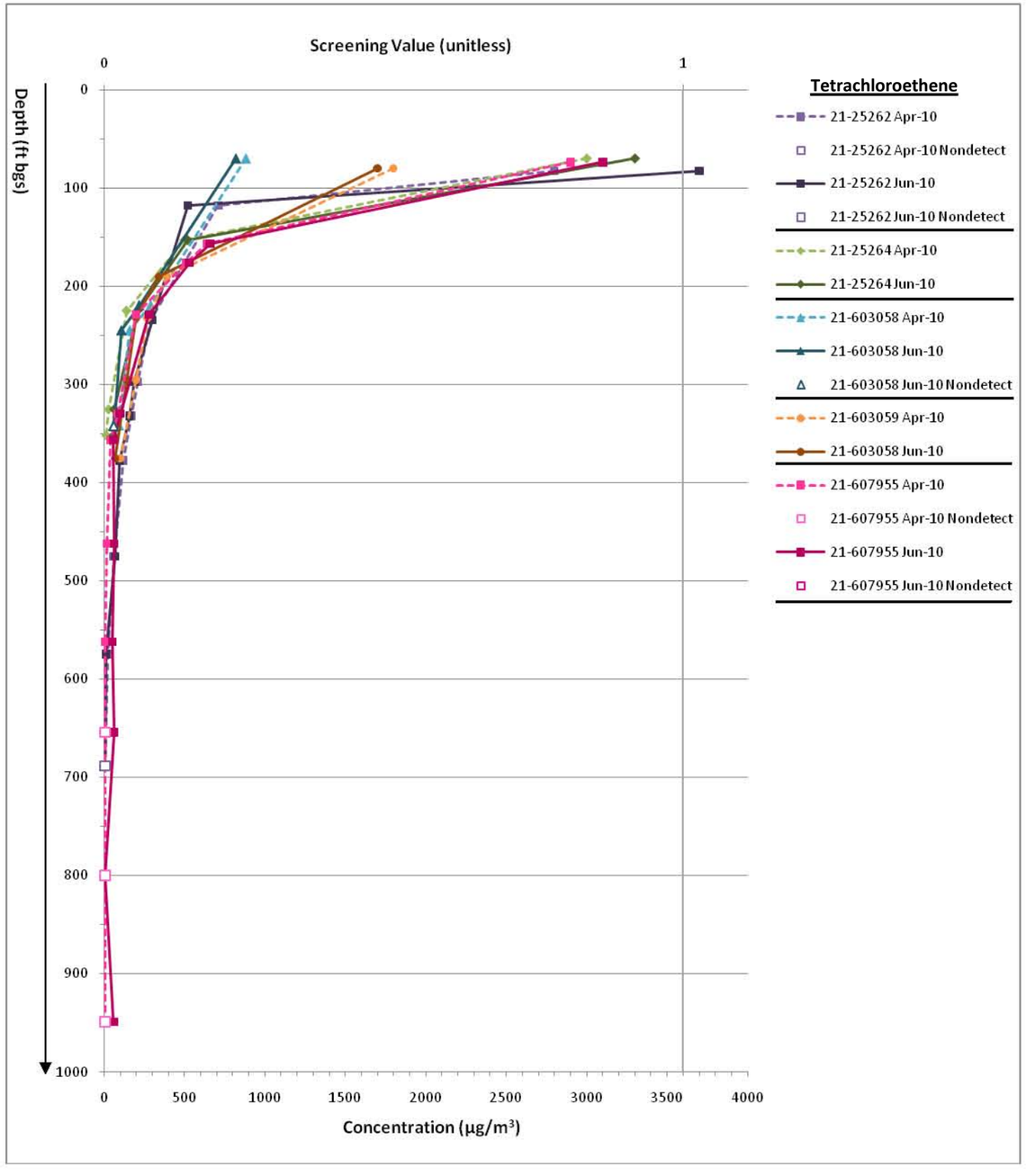




**Figure 5.2-1 Groundwater screening of methylene chloride and tetrachloroethene, April–June 2010**

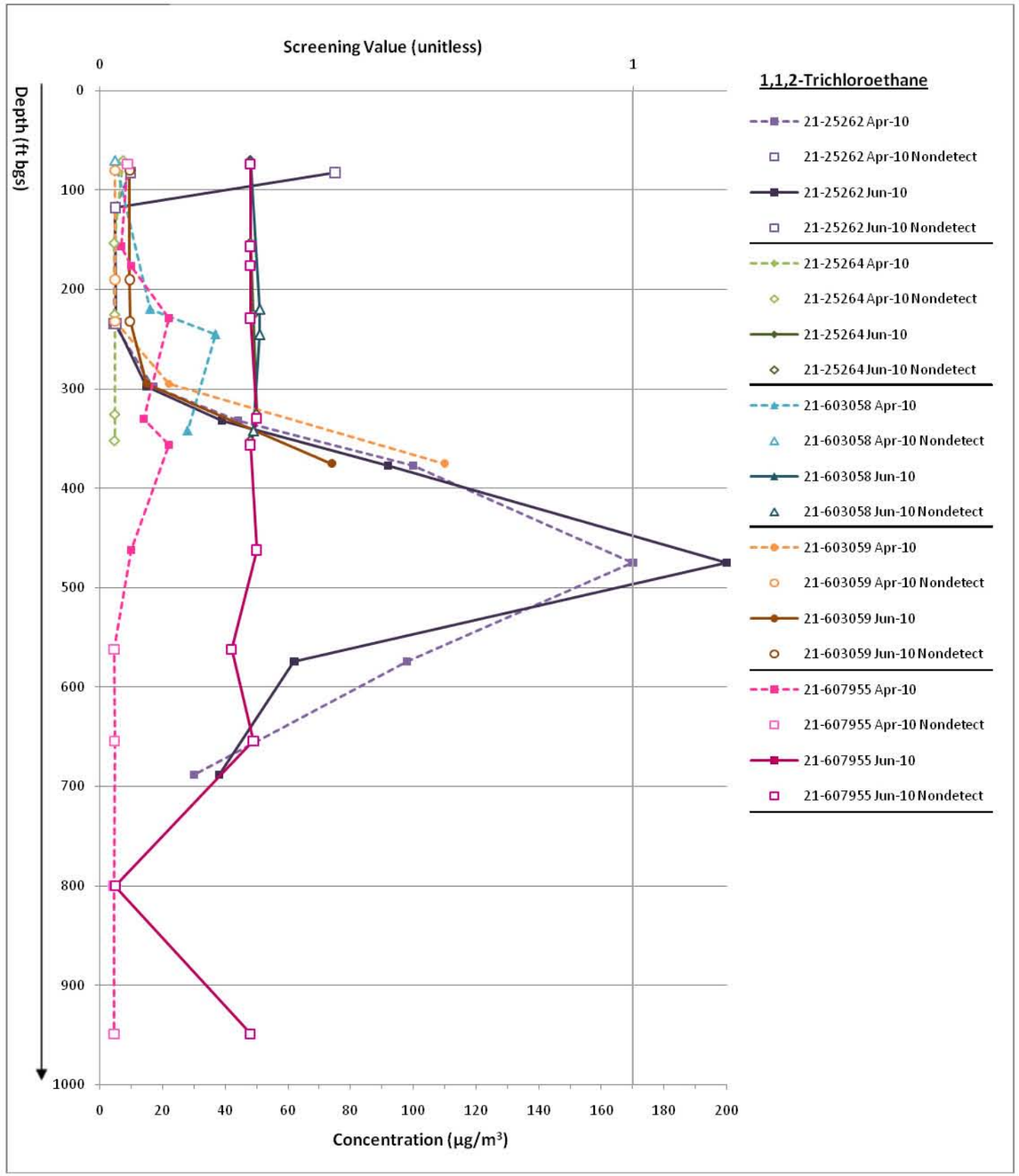



**Figure 5.2-2 Groundwater screening of 1,1,2-tetrachloroethane, April–June 2010**

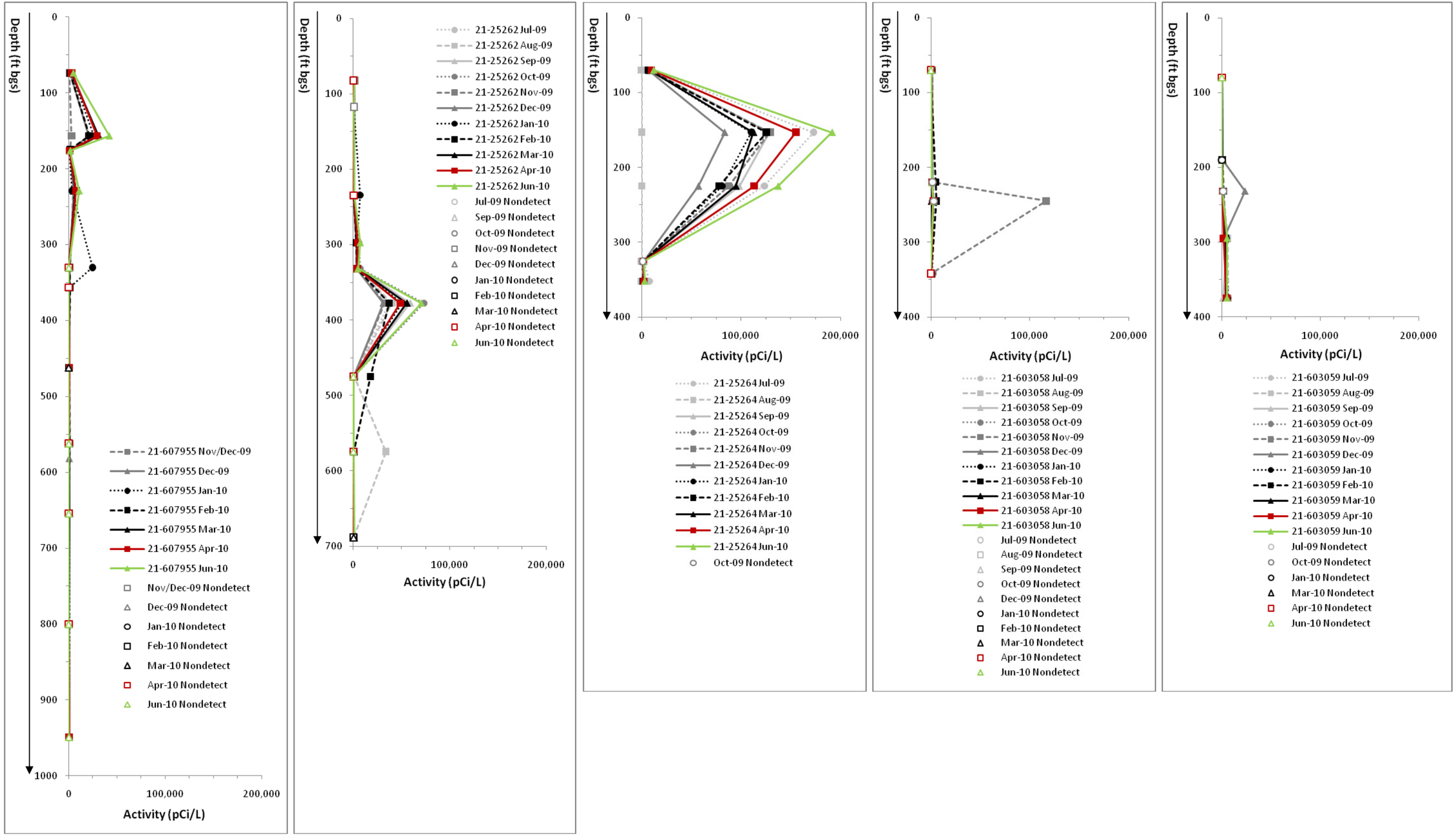



**Figure 5.3-1 Vertical profile of tritium in vapor-monitoring wells 21-607955, 21-25262, 21-25264, 21-603058, and 21-603059, July 2009–June 2010**

**Table 1.0-1**
**History of MDA T Periodic Monitoring Events**

| Quarter | Sampling Event Date | Round | Event ID | Vapor–Monitoring Wells Sampled | Associated Report Title |
|---|---|---|---|---|---|
| 10th Quarter[a] | June 2010 | 18 | 2863 | 21-25262, 21-25264, 21-603058, 21-603059, 21-607955 | April to June 2010 MDA T Periodic Monitoring Report |
| | April 2010 | 17 | 2776 | | |
| 9th Quarter | March 2010 | 16 | 2689 | 21-25262, 21-25264, 21-603058, 21-603059, 21-607955 | January to March 2010 MDA T Periodic Monitoring Report (LANL 2010, 110059) |
| | February 2010 | 15 | 2624 | | |
| | January 2010 | 14 | 2589 | | |
| 8th Quarter | December 2009 | 13 | 2502/2512 | 21-25262, 21-25264, 21-603058, 21-603059, 21-607955 | October to December 2009 MDA T Periodic Monitoring Report (LANL 2010, 109254) |
| | November 2009 | 12 | 2434/2487 | | |
| | October 2009 | 11 | 2280 | | |
| | November 2009 | 12 | 2434/2487 | 21-25262, 21-25264, 21-603058, 21-603059, 21-607955[b] | September to November 2009 MDA T Periodic Monitoring Report (LANL 2010, 108529) |
| | October 2009 | 11 | 2280 | | |
| 7th Quarter | September 2009 | 10 | 2235 | | |
| | August 2009 | 9 | 2192 | 21-25264, 21-603058, 21-603059, 21-25262[c] | June to August 2009 MDA T Periodic Monitoring Report (LANL 2009, 107448) |
| | July 2009 | 8 | 912 | | |
| 6th Quarter[d] | June 2009[e] | 7 | 877 | | |
| | April 2009[e] | 6 | 751 | 21-25264, 21-603058, 21-603059 | February and April 2009 MDA T Periodic Monitoring Report (LANL 2009, 106665) |
| 5th Quarter | February 2009[e] | 5 | 649 | | |
| 4th Quarter | September 2008[e] | 4 | 487 | 21-25264, 21-603058, 21-603059 | Fiscal year 2008 MDA T Periodic Monitoring Report (LANL 2009, 105187) |
| 3rd Quarter | May 2008[e] | 3 | 407 | 21-25264, 21-603058, 21-603059 | |
| 2nd Quarter | February 2008[e] | 2 | 340 | 21-25264, 21-603058, 21-603059 | |
| 1st Quarter | October 2007[e] | 1 | 236 | 21-25264, 21-603058, 21-603059 | |

[a] Monthly sampling ended in April 2010 with resumption of quarterly sampling.

[b] Vapor-monitoring well 21-607955 was first sampled during round 12.

[c] Vapor-monitoring well 21-25262 was completed and sampled beginning in June 2009.

[d] Sampling frequency increased from quarterly to monthly in June 2009.

[e] Vapor-monitoring data for these sampling events are not included in this report.

**Table 2.0-1**
**MDA T Pore-Gas Sampling Depths and Collection Dates, July 2009–June 2010**

| Vapor-Monitoring Well ID | Sample Port | Beginning Depth (ft bgs) | Ending Depth (ft bgs) | Round 8 Collection Date (Event ID 912) | Round 9 Collection Date (Event ID 2192) | Round 10 Collection Date (Event ID 2235) | Round 11 Collection Date (Event ID 2280) | Round 12 Collection Date (Event IDs 2434 and 2487) | Round 13 Collection Date (Event IDs 2502 and 2512) | Round 14 Collection Date (Event ID 2589) | Round 15 Collection Date (Event ID 2624) | Round 16 Collection Date (Event ID 2689) | Round 17 Collection Date (Event ID 2776) | Round 18 Collection Date (Event ID 2863) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-25262 | 1 | 80 | 85 | 7/14/2009 | 8/11/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 2 | 115 | 120 | 7/14/2009 | 8/11/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 3 | 232 | 237 | 7/14/2009 | 8/11/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 4 | 295 | 300 | 7/14/2009 | 8/13/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 5 | 329.5 | 334.5 | 7/14/2009 | 8/13/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 6 | 375 | 380 | 7/14/2009 | 8/11/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 7 | 472 | 478 | 7/14/2009 | 8/13/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 8 | 572 | 577 | 7/14/2009 | 8/14/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25262 | 9 | 686 | 691 | 7/14/2009 | 8/14/2009 | 9/17/2009 | 10/19/2009 | 11/17/2009 | 12/15/2009 | 1/21/2010 | 2/10/2010 | 3/17/2010 | 4/20/2010 | 6/8/2010 |
| 21-25264 | 1 | 67.5 | 72.5 | 7/17/2009 | 8/19/2009 | 9/16/2009 | 10/16/2009 | 11/19/2009 | 12/22/2009 | 1/28/2010 | 2/16/2010 | 3/23/2010 | 4/27/2010 | 6/14/2010 |
| 21-25264 | 2 | 150.5 | 155.5 | 7/17/2009 | 8/19/2009 | 9/16/2009 | 10/16/2009 | 11/19/2009 | 12/22/2009 | 1/28/2010 | 2/16/2010 | 3/23/2010 | 4/27/2010 | 6/14/2010 |
| 21-25264 | 3 | 222.5 | 227.5 | 7/17/2009 | 8/19/2009 | 9/16/2009 | 10/16/2009 | 11/19/2009 | 12/22/2009 | 1/28/2010 | 2/16/2010 | 3/23/2010 | 4/27/2010 | 6/14/2010 |
| 21-25264 | 4 | 323 | 328 | 7/17/2009 | 8/19/2009 | 9/16/2009 | 10/16/2009 | 11/19/2009 | 12/22/2009 | 1/28/2010 | 2/16/2010 | 3/23/2010 | 4/27/2010 | 6/14/2010 |
| 21-25264 | 5 | 349.5 | 354.5 | 7/17/2009 | 8/19/2009 | 9/16/2009 | 10/16/2009 | 11/19/2009 | 12/22/2009 | 1/28/2010 | 2/16/2010 | 3/23/2010 | 4/27/2010 | 6/14/2010 |
| 21-603058 | 1 | 67.5 | 72.5 | 7/16/2009 | 8/18/2009 | 9/15/2009 | 10/14/2009 | 11/20/2009 | 12/21/2009 | 1/27/2010 | 2/17/2010 | 3/22/2010 | 4/26/2010 | 6/15/2010 |
| 21-603058 | 2 | 160.5 | 165.5 | —[a] | — | — | — | — | — | — | — | — | — | — |
| 21-603058 | 3 | 217 | 222 | 7/16/2009 | 8/18/2009 | 9/15/2009 | 10/14/2009 | 11/20/2009 | 12/21/2009 | 1/27/2010 | 2/17/2010 | 3/22/2010 | 4/26/2010 | 6/15/2010 |
| 21-603058 | 4 | 242.5 | 247.5 | 7/16/2009 | 8/18/2009 | 9/15/2009 | 10/14/2009 | 11/20/2009 | 12/21/2009 | 1/27/2010 | 2/17/2010 | 3/22/2010 | 4/26/2010 | 6/15/2010 |
| 21-603058 | 5 | 339.5 | 344.5 | 7/16/2009 | 8/18/2009 | 9/15/2009 | 10/14/2009 | 11/20/2009 | 12/21/2009 | 1/27/2010 | 2/17/2010 | 3/22/2010 | 4/26/2010 | 6/15/2010 |
| 21-603059 | 1 | 77.5 | 82.5 | 7/15/2009 | 8/14/2009 | 9/18/2009 | 10/20/2009 | 11/18/2009 | 12/16/2009 | 1/20/2010 | 2/11/2010 | 3/16/2010 | 4/21/2010 | 6/9/2010 |
| 21-603059 | 2 | 112.5 | 117.5 | — | — | — | — | — | — | — | — | — | — | — |
| 21-603059 | 3 | 187.5 | 192.5 | 7/15/2009 | 8/14/2009 | 9/18/2009 | 10/20/2009 | 11/18/2009 | 12/16/2009 | 1/20/2010 | 2/11/2010 | 3/16/2010 | 4/21/2010 | 6/9/2010 |
| 21-603059 | 4 | 229.5 | 234.5 | 7/15/2009 | 8/14/2009 | 9/18/2009 | 10/20/2009 | 11/18/2009 | 12/16/2009 | 1/20/2010 | 2/11/2010 | 3/16/2010 | 4/21/2010 | 6/9/2010 |
| 21-603059 | 5 | 292.5 | 297.5 | 7/15/2009 | 8/14/2009 | 9/18/2009 | 10/20/2009 | 11/18/2009 | 12/16/2009 | 1/20/2010 | 2/11/2010 | 3/16/2010 | 4/21/2010 | 6/9/2010 |
| 21-603059 | 6 | 372.5 | 377.5 | 7/15/2009 | 8/14/2009 | 9/18/2009 | 10/20/2009 | 11/18/2009 | 12/16/2009 | 1/20/2010 | 2/11/2010 | 3/16/2010 | 4/21/2010 | 6/9/2010 |
| 21-607955 | 1 | 71.1 | 76.4 | n/a[b] | n/a | n/a | n/a | 12/2/2009 | 12/18/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 2 | 153.8 | 159.7 | n/a | n/a | n/a | n/a | 12/3/2009 | 12/18/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 3 | 173.4 | 179 | n/a | n/a | n/a | n/a | 12/2/2009 | 12/18/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 4 | 225.9 | 232.1 | n/a | n/a | n/a | n/a | 12/2/2009 | 12/17/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 5 | 326.6 | 333.4 | n/a | n/a | n/a | n/a | 12/3/2009 | 12/17/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 6 | 353.3 | 359.6 | n/a | n/a | n/a | n/a | 12/2/2009 | 12/17/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 7 | 459.4 | 464.8 | n/a | n/a | n/a | n/a | 12/2/2009 | 12/17/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 8 | 559 | 565 | n/a | n/a | n/a | n/a | 12/2/2009 | 12/17/2009 | 1/25/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 9 | 651.3 | 657.3 | n/a | n/a | n/a | n/a | 12/2/2009 | 12/18/2009 | 1/26/2010 | 2/12/2010 | 3/18/2010 | 4/22/2010 | 6/10/2010 |
| 21-607955 | 10 | 797.2 | 803.1 | n/a | n/a | n/a | n/a | 12/3/2009 | 12/17/2009 | 1/26/2010 | 2/15/2010 | 3/19/2010 | 4/23/2010 | 6/11/2010 |
| 21-607955 | 11 | 946.2 | 952.1 | n/a | n/a | n/a | n/a | 12/3/2009 | 12/17/2009 | 1/26/2010 | 2/15/2010 | 3/19/2010 | 4/23/2010 | 6/11/2010 |

Note: Event IDs refer to the sample collection log and chain of custody packages provided in Appendix D.
[a] n/a = Not applicable.
[b] — = Sample not collected.

**Table 2.0-2**
**Summary of Pore-Gas Samples Collected at MDA T**
**Vapor-Monitoring Well 21-25262, July 2009–June 2010**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| **July 2009** | | | | | |
| MD21-09-11294 | 80–85 | 7/14/2009 | n/a[a] | 09-2636 | 09-2635 |
| MD21-09-11295 | 115–120 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11296 | 232–237 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11297 | 295–300 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11298 | 329.5–334.5 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11299 | 375–380 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11300 | 472–478 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11301 | 572–577 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11302 | 686–691 | 7/14/2009 | n/a | 09-2636 | 09-2635 |
| MD21-09-11303 | 686–691 | 7/14/2009 | FB | —[b] | 09-2635 |
| MD21-09-11304 | 686–691 | 7/14/2009 | FD | 09-2636 | 09-2635 |
| **August 2009** | | | | | |
| MD21-09-11488 | 80–85 | 8/11/2009 | n/a | 09-2853 | 09-2852 |
| MD21-09-11489 | 115–120 | 8/11/2009 | n/a | 09-2853 | 09-2852 |
| MD21-09-11490 | 232–237 | 8/11/2009 | n/a | 09-2853 | 09-2852 |
| MD21-09-11491 | 295–300 | 8/13/2009 | n/a | 09-2882 | 09-2881 |
| MD21-09-11492 | 329.5–334.5 | 8/13/2009 | n/a | 09-2882 | 09-2881 |
| MD21-09-11493 | 375–380 | 8/11/2009 | n/a | 09-2853 | 09-2852 |
| MD21-09-11498 | 375–380 | 8/11/2009 | FB | — | 09-2852 |
| MD21-09-11494 | 472–478 | 8/13/2009 | n/a | 09-2882 | 09-2881 |
| MD21-09-11495 | 572–577 | 8/14/2009 | n/a | 09-2885 | 09-2884 |
| MD21-09-11496 | 686–691 | 8/14/2009 | n/a | 09-2885 | 09-2884 |
| MD21-09-11497 | 686–691 | 8/14/2009 | FD | 09-2885 | 09-2884 |
| **September 2009** | | | | | |
| MD21-09-12622 | 0–0 | 9/17/2009 | FB | — | 09-3282 |
| MD21-09-12612 | 80–85 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12613 | 115–120 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12614 | 232–237 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12615 | 295–300 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12616 | 329.5–334.5 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12621 | 329.5–334.5 | 9/17/2009 | FD | 09-3283 | 09-3282 |
| MD21-09-12617 | 375–380 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12618 | 472–478 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12619 | 572–577 | 9/17/2009 | n/a | 09-3283 | 09-3282 |
| MD21-09-12620 | 686–691 | 9/17/2009 | n/a | 09-3283 | 09-3282 |

**Table 2.0-2 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| **October 2009** | | | | | |
| MD21-10-9 | 0–0 | 10/19/2009 | FB | — | 10-181 |
| MD21-10-32 | 80–85 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-33 | 115–120 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-34 | 232–237 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-35 | 295–300 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-36 | 329.5–334.5 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-41 | 329.5–334.5 | 10/19/2009 | FD | 10-182 | 10-181 |
| MD21-10-37 | 375–380 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-38 | 472–478 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-39 | 572–577 | 10/19/2009 | n/a | 10-182 | 10-181 |
| MD21-10-40 | 686–691 | 10/19/2009 | n/a | 10-182 | 10-181 |
| **November 2009** | | | | | |
| MD21-10-5023 | 0–0 | 11/17/2009 | FB | — | 10-555 |
| MD21-10-5007 | 80–85 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5008 | 115–120 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5009 | 232–237 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5010 | 295–300 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5011 | 329.5–334.5 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5022 | 329.5–334.5 | 11/17/2009 | FD | 10-556 | 10-555 |
| MD21-10-5012 | 375–380 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5013 | 472–478 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5014 | 572–577 | 11/17/2009 | n/a | 10-556 | 10-555 |
| MD21-10-5015 | 686–691 | 11/17/2009 | n/a | 10-556 | 10-555 |
| **December 2009** | | | | | |
| MD21-10-8530 | 0–0 | 12/15/2009 | FB | — | 10-1002 |
| MD21-10-8520 | 80–85 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8521 | 115–120 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8522 | 232–237 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8523 | 295–300 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8524 | 329.5–334.5 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8529 | 329.5–334.5 | 12/15/2009 | FD | 10-1001 | 10-1002 |
| MD21-10-8525 | 375–380 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8526 | 472–478 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8527 | 572–577 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| MD21-10-8528 | 686–691 | 12/15/2009 | n/a | 10-1001 | 10-1002 |
| **January 2010** | | | | | |
| MD21-10-11413 | 80–85 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| MD21-10-11414 | 115–120 | 1/21/2010 | n/a | 10-1402 | 10-1401 |

**Table 2.0-2 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-11415 | 232–237 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| MD21-10-11416 | 295–300 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| MD21-10-11417 | 329.5–334.5 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| MD21-10-11418 | 375–380 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| MD21-10-11419 | 472–478 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| MD21-10-11420 | 572–577 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| MD21-10-11421 | 686–691 | 1/21/2010 | n/a | 10-1402 | 10-1401 |
| **February 2010** | | | | | |
| MD21-10-12288 | 0–0 | 2/10/2010 | FB | — | 10-1814 |
| MD21-10-12278 | 80–85 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12279 | 115–120 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12280 | 232–237 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12281 | 295–300 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12282 | 329.5–334.5 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12287 | 329.5–334.5 | 2/10/2010 | FD | 10-1790 | 10-1789 |
| MD21-10-12283 | 375–380 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12284 | 472–478 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12285 | 572–577 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| MD21-10-12286 | 686–691 | 2/10/2010 | n/a | 10-1790 | 10-1789 |
| **March 2010** | | | | | |
| MD21-10-13999 | 0–0 | 3/17/2010 | FB | — | 10-2494 |
| MD21-10-13989 | 80–85 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13990 | 115–120 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13991 | 232–237 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13992 | 295–300 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13993 | 329.5–334.5 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13998 | 329.5–334.5 | 3/17/2010 | FD | 10-2495 | 10-2494 |
| MD21-10-13994 | 375–380 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13995 | 472–478 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13996 | 572–577 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| MD21-10-13997 | 686–691 | 3/17/2010 | n/a | 10-2495 | 10-2494 |
| **April 2010** | | | | | |
| MD21-10-15963 | 0–0 | 4/20/10 | FB | — | 10-2835 |
| MD21-10-15953 | 80–85 | 4/20/10 | n/a | 10-2836 | 10-2835 |
| MD21-10-15954 | 115–120 | 4/20/10 | n/a | 10-2836 | 10-2835 |
| MD21-10-15955 | 232–237 | 4/20/10 | n/a | 10-2864 | 10-2863 |
| MD21-10-15956 | 295–300 | 4/20/10 | n/a | 10-2836 | 10-2835 |
| MD21-10-15957 | 329.5–334.5 | 4/20/10 | n/a | 10-2836 | 10-2835 |

**Table 2.0-2 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-15962 | 329.5–334.5 | 4/20/10 | FD | 10-2836 | 10-2835 |
| MD21-10-15958 | 375–380 | 4/20/10 | n/a | 10-2836 | 10-2835 |
| MD21-10-15959 | 472–478 | 4/20/10 | n/a | 10-2836 | 10-2835 |
| MD21-10-15960 | 572–577 | 4/20/10 | n/a | 10-2836 | 10-2835 |
| MD21-10-15961 | 686–691 | 4/20/10 | n/a | 10-2836 | 10-2835 |
| **June 2010** | | | | | |
| MD21-10-19336 | 80–85 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19337 | 115–120 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19338 | 232–237 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19339 | 295–300 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19340 | 329.5–334.5 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19345 | 329.5–334.5 | 6/8/10 | FD | 10-3355 | 10-3356 |
| MD21-10-19341 | 375–380 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19342 | 472–478 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19343 | 572–577 | 6/8/10 | n/a | 10-3355 | 10-3356 |
| MD21-10-19344 | 686–691 | 6/8/10 | n/a | 10-3355 | 10-3356 |

[a] n/a = Not applicable.

[b] — = Sample not collected.

**Table 2.0-3**
**Summary of Pore-Gas Samples Collected at MDA T**
**Vapor-Monitoring Well 21-25264, July 2009–June 2010**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| **July 2009** | | | | | |
| MD21-09-11292 | 0–0 | 7/17/2009 | FB | —[a] | 09-2683 |
| MD21-09-11283 | 67.5–72.5 | 7/17/2009 | n/a[b] | 09-2684 | 09-2683 |
| MD21-09-11284 | 150.5–155.5 | 7/17/2009 | n/a | 09-2684 | 09-2683 |
| MD21-09-11293 | 150.5–155.5 | 7/17/2009 | FD | 09-2684 | 09-2683 |
| MD21-09-11285 | 222.5–227.5 | 7/17/2009 | n/a | 09-2684 | 09-2683 |
| MD21-09-11286 | 323–328 | 7/17/2009 | n/a | 09-2684 | 09-2683 |
| MD21-09-11287 | 349.5–354.5 | 7/17/2009 | n/a | 09-2684 | 09-2683 |
| **August 2009** | | | | | |
| MD21-09-11477 | 67.5–72.5 | 8/19/2009 | n/a | 09-2947 | 09-2946 |
| MD21-09-11478 | 150.5–155.5 | 8/19/2009 | n/a | 09-2947 | 09-2946 |
| MD21-09-11486 | 150.5–155.5 | 8/19/2009 | FD | 09-2947 | 09-2946 |
| MD21-09-11479 | 222.5–227.5 | 8/19/2009 | n/a | 09-2947 | 09-2946 |
| MD21-09-11480 | 323–328 | 8/19/2009 | n/a | 09-2947 | 09-2946 |
| MD21-09-11481 | 349.5–354.5 | 8/19/2009 | n/a | 09-2947 | 09-2946 |
| MD21-09-11483 | 349.5–354.5 | 8/19/2009 | FB | — | 09-2946 |
| **September 2009** | | | | | |
| MD21-09-12611 | 0–0 | 9/16/2009 | FB | — | 09-3260 |
| MD21-09-12605 | 67.5–72.5 | 9/16/2009 | n/a | 09-3261 | 09-3260 |
| MD21-09-12606 | 150.5–155.5 | 9/16/2009 | n/a | 09-3261 | 09-3260 |
| MD21-09-12610 | 150.5–155.5 | 9/16/2009 | FD | 09-3261 | 09-3260 |
| MD21-09-12607 | 222.5–227.5 | 9/16/2009 | n/a | 09-3261 | 09-3260 |
| MD21-09-12608 | 323–328 | 9/16/2009 | n/a | 09-3261 | 09-3260 |
| MD21-09-12609 | 349.5–354.5 | 9/16/2009 | n/a | 09-3261 | 09-3260 |
| **October 2009** | | | | | |
| MD21-10-31 | 0–0 | 10/16/2009 | FB | — | 10-157 |
| MD21-10-25 | 67.5–72.5 | 10/16/2009 | n/a | 10-158 | 10-157 |
| MD21-10-26 | 150.5–155.5 | 10/16/2009 | n/a | 10-158 | 10-157 |
| MD21-10-30 | 150.5–155.5 | 10/16/2009 | FD | 10-158 | 10-157 |
| MD21-10-27 | 222.5–227.5 | 10/16/2009 | n/a | 10-158 | 10-157 |
| MD21-10-28 | 323–328 | 10/16/2009 | n/a | 10-158 | 10-157 |
| MD21-10-29 | 349.5–354.5 | 10/16/2009 | n/a | 10-158 | 10-157 |
| **November 2009** | | | | | |
| MD21-10-5021 | 0–0 | 11/19/2009 | FB | — | 10-627 |
| MD21-10-5002 | 67.5–72.5 | 11/19/2009 | n/a | 10-628 | 10-627 |
| MD21-10-5003 | 150.5–155.5 | 11/19/2009 | n/a | 10-628 | 10-627 |

**Table 2.0-3 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-5020 | 150.5–155.5 | 11/19/2009 | FD | 10-628 | 10-627 |
| MD21-10-5004 | 222.5–227.5 | 11/19/2009 | n/a | 10-628 | 10-627 |
| MD21-10-5005 | 323–328 | 11/19/2009 | n/a | 10-628 | 10-627 |
| MD21-10-5006 | 349.5–354.5 | 11/19/2009 | n/a | 10-628 | 10-627 |
| **December 2009** | | | | | |
| MD21-10-8519 | 0–0 | 12/22/2009 | FB | — | 10-1061 |
| MD21-10-8509 | 67.5–72.5 | 12/22/2009 | n/a | 10-1062 | 10-1061 |
| MD21-10-8510 | 150.5–155.5 | 12/22/2009 | n/a | 10-1062 | 10-1061 |
| MD21-10-8511 | 222.5–227.5 | 12/22/2009 | n/a | 10-1062 | 10-1061 |
| MD21-10-8512 | 323–328 | 12/22/2009 | n/a | 10-1062 | 10-1061 |
| MD21-10-8513 | 349.5–354.5 | 12/22/2009 | n/a | 10-1062 | 10-1061 |
| **January 2010** | | | | | |
| MD21-10-11412 | 0–0 | 1/28/2010 | FB | — | 10-1481 |
| MD21-10-11406 | 67.5–72.5 | 1/28/2010 | n/a | 10-1482 | 10-1481 |
| MD21-10-11407 | 150.5–155.5 | 1/28/2010 | n/a | 10-1482 | 10-1481 |
| MD21-10-11411 | 150.5–155.5 | 1/28/2010 | FD | 10-1482 | 10-1481 |
| MD21-10-11408 | 222.5–227.5 | 1/28/2010 | n/a | 10-1482 | 10-1481 |
| MD21-10-11409 | 323–328 | 1/28/2010 | n/a | 10-1482 | 10-1481 |
| MD21-10-11410 | 349.5–354.5 | 1/28/2010 | n/a | 10-1482 | 10-1481 |
| **February 2010** | | | | | |
| MD21-10-12271 | 67.5–72.5 | 2/16/2010 | n/a | 10-1887 | 10-1888 |
| MD21-10-12272 | 150.5–155.5 | 2/16/2010 | n/a | 10-1887 | 10-1888 |
| MD21-10-12273 | 222.5–227.5 | 2/16/2010 | n/a | 10-1887 | 10-1888 |
| MD21-10-12274 | 323–328 | 2/16/2010 | n/a | 10-1887 | 10-1888 |
| MD21-10-12275 | 349.5–354.5 | 2/16/2010 | n/a | 10-1887 | 10-1888 |
| **March 2010** | | | | | |
| MD21-10-13984 | 67.5–72.5 | 3/23/2010 | n/a | 10-2581 | 10-2580 |
| MD21-10-13985 | 150.5–155.5 | 3/23/2010 | n/a | 10-2581 | 10-2580 |
| MD21-10-14015 | 150.5–155.5 | 3/23/2010 | FD | 10-2581 | 10-2580 |
| MD21-10-13986 | 222.5–227.5 | 3/23/2010 | n/a | 10-2581 | 10-2580 |
| MD21-10-13987 | 323–328 | 3/23/2010 | n/a | 10-2581 | 10-2580 |
| MD21-10-13988 | 349.5–354.5 | 3/23/2010 | n/a | 10-2581 | 10-2580 |
| **April 2010** | | | | | |
| MD21-10-15952 | 0–0 | 4/27/2010 | FB | — | 10-2933 |
| MD21-10-15946 | 67.5–72.5 | 4/27/2010 | n/a | 10-2934 | 10-2933 |
| MD21-10-15947 | 150.5–155.5 | 4/27/2010 | n/a | 10-2934 | 10-2933 |
| MD21-10-15951 | 150.5–155.5 | 4/27/2010 | FD | 10-2934 | 10-2933 |
| MD21-10-15948 | 222.5–227.5 | 4/27/2010 | n/a | 10-2934 | 10-2933 |

**Table 2.0-3 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-15949 | 323–328 | 4/27/2010 | n/a | 10-2934 | 10-2933 |
| MD21-10-15950 | 349.5–354.5 | 4/27/2010 | n/a | 10-2934 | 10-2933 |
| **June 2010** | | | | | |
| MD21-10-19335 | 0–0 | 6/14/2010 | FB | — | 10-3406 |
| MD21-10-19329 | 67.5–72.5 | 6/14/2010 | n/a | 10-3407 | 10-3406 |
| MD21-10-19330 | 150.5–155.5 | 6/14/2010 | n/a | 10-3407 | 10-3406 |
| MD21-10-19334 | 150.5–155.5 | 6/14/2010 | FD | 10-3407 | 10-3406 |
| MD21-10-19331 | 222.5–227.5 | 6/14/2010 | n/a | 10-3407 | 10-3406 |
| MD21-10-19332 | 323–328 | 6/14/2010 | n/a | 10-3407 | 10-3406 |
| MD21-10-19333 | 349.5–354.5 | 6/14/2010 | n/a | 10-3407 | 10-3406 |

[a] — = Sample not collected.

[b] n/a = Not applicable.

**Table 2.0-4**
**Summary of Pore-Gas Samples Collected at MDA T**
**Vapor-Monitoring Well 21-603058, July 2009–June 2010**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| **July 2009** | | | | | |
| MD21-09-11290 | 0–0 | 7/16/2009 | FB | —[a] | 09-2669 |
| MD21-09-11278 | 67.5–72.5 | 7/16/2009 | n/a[b] | 09-2670 | 09-2669 |
| MD21-09-11280 | 217–222 | 7/16/2009 | n/a | 09-2670 | 09-2669 |
| MD21-09-11291 | 217–222 | 7/16/2009 | FD | 09-2670 | 09-2669 |
| MD21-09-11281 | 242.5–247.5 | 7/16/2009 | n/a | 09-2670 | 09-2669 |
| MD21-09-11282 | 339.5–344.5 | 7/16/2009 | n/a | 09-2670 | 09-2669 |
| **August 2009** | | | | | |
| MD21-09-11472 | 67.5–72.5 | 8/18/2009 | n/a | 09-2920 | 09-2919 |
| MD21-09-11484 | 217–222 | 8/18/2009 | FD | 09-2920 | 09-2919 |
| MD21-09-11473 | 217–222 | 8/18/2009 | n/a | 09-2920 | 09-2919 |
| MD21-09-11474 | 242.5–247.5 | 8/18/2009 | n/a | 09-2920 | 09-2919 |
| MD21-09-11485 | 339.5–344.5 | 8/18/2009 | FB | — | 09-2919 |
| MD21-09-11475 | 339.5–344.5 | 8/18/2009 | n/a | 09-2920 | 09-2919 |
| **September 2009** | | | | | |
| MD21-09-12598 | 67.5–72.5 | 9/15/2009 | n/a | 09-3228 | 09-3227 |
| MD21-09-12600 | 217–222 | 9/15/2009 | n/a | 09-3228 | 09-3227 |
| MD21-09-12603 | 242.5–247.5 | 9/15/2009 | FD | 09-3228 | 09-3227 |
| MD21-09-12601 | 242.5–247.5 | 9/15/2009 | n/a | 09-3228 | 09-3227 |
| MD21-09-12602 | 339.5–344.5 | 9/15/2009 | n/a | 09-3228 | 09-3227 |
| **October 2009** | | | | | |
| MD21-10-18 | 67.5–72.5 | 10/14/2009 | n/a | 10-139 | 10-138 |
| MD21-10-20 | 217–222 | 10/14/2009 | n/a | 10-139 | 10-138 |
| MD21-10-21 | 242.5–247.5 | 10/14/2009 | n/a | 10-139 | 10-138 |
| MD21-10-23 | 242.5–247.5 | 10/14/2009 | FD | 10-139 | 10-138 |
| MD21-10-22 | 339.5–344.5 | 10/14/2009 | n/a | 10-139 | 10-138 |
| **November 2009** | | | | | |
| MD21-10-5019 | 0–0 | 11/20/2009 | FB | — | 10-651 |
| MD21-10-4997 | 67.5–72.5 | 11/20/2009 | n/a | 10-652 | 10-651 |
| MD21-10-4998 | 217–222 | 11/20/2009 | n/a | 10-652 | 10-651 |
| MD21-10-4999 | 242.5–247.5 | 11/20/2009 | n/a | 10-652 | 10-651 |
| MD21-10-5018 | 242.5–247.5 | 11/20/2009 | FD | 10-652 | 10-651 |
| MD21-10-5000 | 339.5–344.5 | 11/20/2009 | n/a | 10-652 | 10-651 |
| **December 2009** | | | | | |
| MD21-10-8517 | 0–0 | 12/21/2009 | FB | — | 10-1034 |
| MD21-10-8504 | 67.5–72.5 | 12/21/2009 | n/a | 10-1033 | 10-1034 |

**Table 2.0-4 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-8506 | 217–222 | 12/21/2009 | n/a | 10-1033 | 10-1034 |
| MD21-10-8507 | 242.5–247.5 | 12/21/2009 | n/a | 10-1033 | 10-1034 |
| MD21-10-8516 | 242.5–247.5 | 12/21/2009 | FD | 10-1033 | 10-1034 |
| MD21-10-8508 | 339.5–344.5 | 12/21/2009 | n/a | 10-1033 | 10-1034 |
| **January 2010** | | | | | |
| MD21-10-11405 | 0–0 | 1/27/2010 | FB | — | 10-1454 |
| MD21-10-11399 | 67.5–72.5 | 1/27/2010 | n/a | 10-1455 | 10-1454 |
| MD21-10-11401 | 217–222 | 1/27/2010 | n/a | 10-1455 | 10-1454 |
| MD21-10-11402 | 242.5–247.5 | 1/27/2010 | n/a | 10-1455 | 10-1454 |
| MD21-10-11404 | 242.5–247.5 | 1/27/2010 | FD | 10-1455 | 10-1454 |
| MD21-10-11403 | 339.5–344.5 | 1/27/2010 | n/a | 10-1455 | 10-1454 |
| **February 2010** | | | | | |
| MD21-10-12270 | 0–0 | 2/17/2010 | FB | — | 10-1917 |
| MD21-10-12264 | 67.5–72.5 | 2/17/2010 | n/a | 10-1901 | 10-1900 |
| MD21-10-12266 | 217–222 | 2/17/2010 | n/a | 10-1901 | 10-1900 |
| MD21-10-12267 | 242.5–247.5 | 2/17/2010 | n/a | 10-1901 | 10-1900 |
| MD21-10-12269 | 242.5–247.5 | 2/17/2010 | FD | 10-1901 | 10-1900 |
| MD21-10-12268 | 339.5–344.5 | 2/17/2010 | n/a | 10-1901 | 10-1900 |
| **March 2010** | | | | | |
| MD21-10-13978 | 67.5–72.5 | 3/22/2010 | n/a | 10-2557 | 10-2556 |
| MD21-10-13979 | 217–222 | 3/22/2010 | n/a | 10-2557 | 10-2556 |
| MD21-10-13980 | 242.5–247.5 | 3/22/2010 | n/a | 10-2557 | 10-2556 |
| MD21-10-13982 | 242.5–247.5 | 3/22/2010 | FD | 10-2557 | 10-2556 |
| MD21-10-14014 | 339.5–344.5 | 3/22/2010 | n/a | 10-2557 | 10-2556 |
| **April 2010** | | | | | |
| MD21-10-15945 | 0–0 | 4/26/2010 | FB | — | 10-2922 |
| MD21-10-15939 | 67.5–72.5 | 4/26/2010 | n/a | 10-2923 | 10-2922 |
| MD21-10-15941 | 217–222 | 4/26/2010 | n/a | 10-2923 | 10-2922 |
| MD21-10-15942 | 242.5–247.5 | 4/26/2010 | n/a | 10-2923 | 10-2922 |
| MD21-10-15944 | 242.5–247.5 | 4/26/2010 | FD | 10-2923 | 10-2922 |
| MD21-10-15943 | 339.5–344.5 | 4/26/2010 | n/a | 10-2923 | 10-2922 |
| **June 2010** | | | | | |
| MD21-10-19328 | 0–0 | 6/15/2010 | FB | — | 10-3412 |
| MD21-10-19322 | 67.5–72.5 | 6/15/2010 | n/a | 10-3413 | 10-3412 |
| MD21-10-19324 | 217–222 | 6/15/2010 | n/a | 10-3413 | 10-3412 |
| MD21-10-19325 | 242.5–247.5 | 6/15/2010 | n/a | 10-3413 | 10-3412 |

**Table 2.0-4 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-19327 | 242.5–247.5 | 6/15/2010 | FD | 10-3413 | 10-3412 |
| MD21-10-19326 | 339.5–344.5 | 6/15/2010 | n/a | 10-3413 | 10-3412 |

[a] — = Sample not collected.

[b] n/a = Not applicable.

**Table 2.0-5**
**Summary of Pore-Gas Samples Collected at MDA T**
**Vapor-Monitoring Well 21-603059, July 2009–June 2010**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| **July 2009** | | | | | |
| MD21-09-11272 | 77.5–82.5 | 7/15/2009 | n/a[a] | 09-2655 | 09-2654 |
| MD21-09-11273 | 187.5–192.5 | 7/15/2009 | n/a | 09-2655 | 09-2654 |
| MD21-09-11274 | 229.5–234.5 | 7/15/2009 | n/a | 09-2655 | 09-2654 |
| MD21-09-11275 | 292.5–297.5 | 7/15/2009 | n/a | 09-2655 | 09-2654 |
| MD21-09-11276 | 372.5–377.5 | 7/15/2009 | n/a | 09-2655 | 09-2654 |
| MD21-09-11289 | 372.5–377.5 | 7/15/2009 | FD | 09-2655 | 09-2654 |
| **August 2009** | | | | | |
| MD21-09-11469 | 77.5–82.5 | 8/14/2009 | n/a | 09-2901 | 09-2900 |
| MD21-09-11470 | 187.5–192.5 | 8/14/2009 | n/a | 09-2901 | 09-2900 |
| MD21-09-11471 | 229.5–234.5 | 8/14/2009 | n/a | 09-2901 | 09-2900 |
| MD21-09-11468 | 292.5–297.5 | 8/14/2009 | n/a | 09-2901 | 09-2900 |
| MD21-09-11467 | 372.5–377.5 | 8/14/2009 | n/a | 09-2901 | 09-2900 |
| MD21-09-11482 | 372.5–377.5 | 8/14/2009 | FD | 09-2901 | 09-2900 |
| **September 2009** | | | | | |
| MD21-09-12630 | 0–0 | 9/18/2009 | FB | —[b] | 09-3289 |
| MD21-09-12623 | 77.5–82.5 | 9/18/2009 | n/a | 09-3290 | 09-3289 |
| MD21-09-12624 | 187.5–192.5 | 9/18/2009 | n/a | 09-3290 | 09-3289 |
| MD21-09-12625 | 229.5–234.5 | 9/18/2009 | n/a | 09-3290 | 09-3289 |
| MD21-09-12626 | 292.5–297.5 | 9/18/2009 | n/a | 09-3290 | 09-3289 |
| MD21-09-12627 | 372.5–377.5 | 9/18/2009 | n/a | 09-3290 | 09-3289 |
| MD21-09-12629 | 372.5–377.5 | 9/18/2009 | FD | 09-3290 | 09-3289 |
| **October 2009** | | | | | |
| MD21-10-17 | 0–0 | 10/20/2009 | FB | — | 10-195 |
| MD21-10-10 | 77.5–82.5 | 10/20/2009 | n/a | 10-196 | 10-195 |
| MD21-10-11 | 187.5–192.5 | 10/20/2009 | n/a | 10-196 | 10-195 |
| MD21-10-12 | 229.5–234.5 | 10/20/2009 | n/a | 10-196 | 10-195 |
| MD21-10-13 | 292.5–297.5 | 10/20/2009 | n/a | 10-196 | 10-195 |
| MD21-10-14 | 372.5–377.5 | 10/20/2009 | n/a | 10-196 | 10-195 |
| MD21-10-16 | 372.5–377.5 | 10/20/2009 | FD | 10-196 | 10-195 |
| **November 2009** | | | | | |
| MD21-10-5017 | 0–0 | 11/18/2009 | FB | — | 10-586 |
| MD21-10-4991 | 77.5–82.5 | 11/18/2009 | n/a | 10-587 | 10-586 |
| MD21-10-4993 | 187.5–192.5 | 11/18/2009 | n/a | 10-587 | 10-586 |
| MD21-10-4994 | 229.5–234.5 | 11/18/2009 | n/a | 10-587 | 10-586 |
| MD21-10-4995 | 292.5–297.5 | 11/18/2009 | n/a | 10-587 | 10-586 |

**Table 2.0-5 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-4996 | 372.5–377.5 | 11/18/2009 | n/a | 10-587 | 10-586 |
| MD21-10-5016 | 372.5–377.5 | 11/18/2009 | FD | 10-587 | 10-586 |
| **December 2009** | | | | | |
| MD21-10-8515 | 0–0 | 12/16/2009 | FB | — | 10-1006 |
| MD21-10-8498 | 77.5–82.5 | 12/16/2009 | n/a | 10-980 | 10-981 |
| MD21-10-8499 | 187.5–192.5 | 12/16/2009 | n/a | 10-980 | 10-981 |
| MD21-10-8500 | 229.5–234.5 | 12/16/2009 | n/a | 10-980 | 10-981 |
| MD21-10-8501 | 292.5–297.5 | 12/16/2009 | n/a | 10-980 | 10-981 |
| MD21-10-8502 | 372.5–377.5 | 12/16/2009 | n/a | 10-980 | 10-981 |
| MD21-10-8514 | 372.5–377.5 | 12/16/2009 | FD | 10-980 | 10-981 |
| **January 2010** | | | | | |
| MD21-10-11398 | 0–0 | 1/20/2010 | FB | — | 10-1361 |
| MD21-10-11391 | 77.5–82.5 | 1/20/2010 | n/a | 10-1362 | 10-1361 |
| MD21-10-11393 | 187.5–192.5 | 1/20/2010 | n/a | 10-1362 | 10-1361 |
| MD21-10-11394 | 229.5–234.5 | 1/20/2010 | n/a | 10-1362 | 10-1361 |
| MD21-10-11395 | 292.5–297.5 | 1/20/2010 | n/a | 10-1362 | 10-1361 |
| MD21-10-11396 | 372.5–377.5 | 1/20/2010 | n/a | 10-1362 | 10-1361 |
| MD21-10-11397 | 372.5–377.5 | 1/20/2010 | FD | 10-1362 | 10-1361 |
| **February 2010** | | | | | |
| MD21-10-12263 | 0–0 | 2/11/2010 | FB | — | 10-1842 |
| MD21-10-12256 | 77.5–82.5 | 2/11/2010 | n/a | 10-1815 | 10-1814 |
| MD21-10-12258 | 187.5–192.5 | 2/11/2010 | n/a | 10-1815 | 10-1814 |
| MD21-10-12259 | 229.5–234.5 | 2/11/2010 | n/a | 10-1815 | 10-1814 |
| MD21-10-12260 | 292.5–297.5 | 2/11/2010 | n/a | 10-1815 | 10-1814 |
| MD21-10-12261 | 372.5–377.5 | 2/11/2010 | n/a | 10-1815 | 10-1814 |
| MD21-10-12262 | 372.5–377.5 | 2/11/2010 | FD | 10-1815 | 10-1814 |
| **March 2010** | | | | | |
| MD21-10-13977 | 0–0 | 3/16/2010 | FB | — | 10-2484 |
| MD21-10-13971 | 77.5–82.5 | 3/16/2010 | n/a | 10-2485 | 10-2484 |
| MD21-10-13972 | 187.5–192.5 | 3/16/2010 | n/a | 10-2485 | 10-2484 |
| MD21-10-13973 | 229.5–234.5 | 3/16/2010 | n/a | 10-2485 | 10-2484 |
| MD21-10-13974 | 292.5–297.5 | 3/16/2010 | n/a | 10-2485 | 10-2484 |
| MD21-10-13975 | 372.5–377.5 | 3/16/2010 | n/a | 10-2485 | 10-2484 |
| MD21-10-13976 | 372.5–377.5 | 3/16/2010 | FD | 10-2485 | 10-2484 |
| **April 2010** | | | | | |
| MD21-10-15933 | 77.5–82.5 | 4/21/2010 | n/a | 10-2864 | 10-2863 |
| MD21-10-15935 | 187.5–192.5 | 4/21/2010 | n/a | 10-2864 | 10-2863 |
| MD21-10-15936 | 229.5–234.5 | 4/21/2010 | n/a | 10-2864 | 10-2863 |

**Table 2.0-5 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-15937 | 292.5–297.5 | 4/21/2010 | n/a | 10-2864 | 10-2863 |
| MD21-10-15932 | 372.5–377.5 | 4/21/2010 | FD | 10-2864 | 10-2863 |
| MD21-10-15938 | 372.5–377.5 | 4/21/2010 | n/a | 10-2864 | 10-2863 |
| **June 2010** | | | | | |
| MD21-10-19314 | 77.5–82.5 | 6/9/2010 | n/a | 10-3363 | 10-3362 |
| MD21-10-19316 | 187.5–192.5 | 6/9/2010 | n/a | 10-3363 | 10-3362 |
| MD21-10-19317 | 229.5–234.5 | 6/9/2010 | n/a | 10-3363 | 10-3362 |
| MD21-10-19318 | 292.5–297.5 | 6/9/2010 | n/a | 10-3363 | 10-3362 |
| MD21-10-19319 | 372.5–377.5 | 6/9/2010 | n/a | 10-3363 | 10-3362 |
| MD21-10-19320 | 372.5–377.5 | 6/9/2010 | FD | 10-3363 | 10-3362 |

[a] n/a = Not applicable.

[b] — = Sample not collected.

**Table 2.0-6**
**Summary of Pore-Gas Samples Collected at MDA T**
**Vapor-Monitoring Well 21-607955, November 2009–June 2010**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| **November/December 2009** | | | | | |
| MD21-10-7578 | 0–0 | 12/3/2009 | FB | —[a] | 10-793 |
| MD21-10-7567 | 71.1–76.4 | 12/2/2009 | n/a[b] | 10-765 | 10-764 |
| MD21-10-7568 | 153.8–159.7 | 12/3/2009 | n/a | 10-794 | 10-793 |
| MD21-10-7569 | 173.4–179 | 12/2/2009 | n/a | 10-765 | 10-764 |
| MD21-10-7570 | 225.9–232.1 | 12/2/2009 | n/a | 10-765 | 10-764 |
| MD21-10-7571 | 326.6–333.4 | 12/3/2009 | n/a | 10-794 | 10-793 |
| MD21-10-7579 | 326.6–333.4 | 12/3/2009 | FD | 10-794 | 10-793 |
| MD21-10-7572 | 353.3–359.6 | 12/2/2009 | n/a | 10-765 | 10-764 |
| MD21-10-7573 | 459.4–464.8 | 12/2/2009 | n/a | 10-765 | 10-764 |
| MD21-10-7574 | 559–565 | 12/2/2009 | n/a | 10-765 | 10-764 |
| MD21-10-7575 | 651.3–657.3 | 12/2/2009 | n/a | 10-765 | 10-764 |
| MD21-10-7576 | 797.2–803.1 | 12/3/2009 | n/a | 10-794 | 10-793 |
| MD21-10-7577 | 946.2–952.1 | 12/3/2009 | n/a | 10-794 | 10-793 |
| **December 2009** | | | | | |
| MD21-10-8111 | 0–0 | 12/18/2009 | FB | — | 10-1008 |
| MD21-10-8099 | 71.1–76.4 | 12/18/2009 | n/a | 10-1007 | 10-1008 |
| MD21-10-8100 | 153.8–159.7 | 12/18/2009 | n/a | 10-1007 | 10-1008 |
| MD21-10-8101 | 173.4–179 | 12/18/2009 | n/a | 10-1007 | 10-1008 |
| MD21-10-8102 | 225.9–232.1 | 12/17/2009 | n/a | 10-1003 | 10-1004 |
| MD21-10-8103 | 326.6–333.4 | 12/17/2009 | n/a | 10-1003 | 10-1004 |
| MD21-10-8110 | 326.6–333.4 | 12/17/2009 | FD | 10-1003 | 10-1004 |
| MD21-10-8104 | 353.3–359.6 | 12/17/2009 | n/a | 10-1003 | 10-1004 |
| MD21-10-8105 | 459.4–464.8 | 12/17/2009 | n/a | 10-1003 | 10-1004 |
| MD21-10-8106 | 559–565 | 12/17/2009 | n/a | 10-1003 | 10-1004 |
| MD21-10-8107 | 651.3–657.3 | 12/18/2009 | n/a | 10-1007 | 10-1008 |
| MD21-10-8108 | 797.2–803.1 | 12/17/2009 | n/a | 10-1003 | 10-1004 |
| MD21-10-8109 | 946.2–952.1 | 12/17/2009 | n/a | 10-1003 | 10-1004 |
| **January 2010** | | | | | |
| MD21-10-11424 | 71.1–76.4 | 1/25/2010 | n/a | — | 10-1420 |
| MD21-10-11425 | 153.8–159.7 | 1/25/2010 | n/a | 10-1405 | 10-1404 |
| MD21-10-11426 | 173.4–179 | 1/25/2010 | n/a | 10-1405 | 10-1404 |
| MD21-10-11427 | 225.9–232.1 | 1/25/2010 | n/a | 10-1405 | 10-1404 |
| MD21-10-11428 | 326.6–333.4 | 1/25/2010 | n/a | 10-1405 | 10-1404 |
| MD21-10-11435 | 326.6–333.4 | 1/25/2010 | FD | 10-1405 | 10-1404 |
| MD21-10-11429 | 353.3–359.6 | 1/25/2010 | n/a | 10-1405 | 10-1404 |

**Table 2.0-6 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-11430 | 459.4–464.8 | 1/25/2010 | n/a | 10-1405 | 10-1404 |
| MD21-10-11431 | 559–565 | 1/25/2010 | n/a | 10-1405 | 10-1404 |
| MD21-10-11432 | 651.3–657.3 | 1/26/2010 | n/a | 10-1405 | 10-1404 |
| MD21-10-11433 | 797.2–803.1 | 1/26/2010 | n/a | 10-1421 | 10-1420 |
| MD21-10-11434 | 946.2–952.1 | 1/26/2010 | n/a | 10-1421 | 10-1420 |
| **February 2010** | | | | | |
| MD21-10-12301 | 0–0 | 2/15/2010 | FB | — | 10-1888 |
| MD21-10-12289 | 71.1–76.4 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12290 | 153.8–159.7 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12291 | 173.4–179 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12292 | 225.9–232.1 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12293 | 326.6–333.4 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12300 | 326.6–333.4 | 2/12/2010 | FD | 10-1843 | 10-1842 |
| MD21-10-12294 | 353.3–359.6 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12295 | 459.4–464.8 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12296 | 559–565 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12297 | 651.3–657.3 | 2/12/2010 | n/a | 10-1843 | 10-1842 |
| MD21-10-12298 | 797.2–803.1 | 2/15/2010 | n/a | 10-1946 | 10-1945 |
| MD21-10-12299 | 946.2–952.1 | 2/15/2010 | n/a | 10-1887 | 10-1888 |
| **March 2010** | | | | | |
| MD21-10-14012 | 0–0 | 3/19/2010 | FB | — | 10-2538 |
| MD21-10-14000 | 71.1–76.4 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14001 | 153.8–159.7 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14002 | 173.4–179 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14003 | 225.9–232.1 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14004 | 326.6–333.4 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14011 | 326.6–333.4 | 3/18/2010 | FD | 10-2516 | 10-2515 |
| MD21-10-14005 | 353.3–359.6 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14006 | 459.4–464.8 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14007 | 559–565 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14008 | 651.3–657.3 | 3/18/2010 | n/a | 10-2516 | 10-2515 |
| MD21-10-14009 | 797.2–803.1 | 3/19/2010 | n/a | 10-2539 | 10-2538 |
| MD21-10-14010 | 946.2–952.1 | 3/19/2010 | n/a | 10-2539 | 10-2538 |
| **April 2010** | | | | | |
| MD21-10-15976 | 0–0 | 4/23/10 | FB | — | 10-2894 |
| MD21-10-15964 | 71.1–76.4 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15965 | 153.8–159.7 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15966 | 173.4–179 | 4/22/10 | n/a | 10-2876 | 10-2875 |

**Table 2.0-6 (continued)**

| Sample ID | Depth (ft bgs) | Collection Date | Field QC Type | Request Number | |
|---|---|---|---|---|---|
| | | | | Tritium | VOCs |
| MD21-10-15967 | 225.9–232.1 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15968 | 326.6–333.4 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15975 | 326.6–333.4 | 4/22/10 | FD | 10-2876 | 10-2875 |
| MD21-10-15969 | 353.3–359.6 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15970 | 459.4–464.8 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15971 | 559–565 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15972 | 651.3–657.3 | 4/22/10 | n/a | 10-2876 | 10-2875 |
| MD21-10-15973 | 797.2–803.1 | 4/23/10 | n/a | 10-2895 | 10-2894 |
| MD21-10-15974 | 946.2–952.1 | 4/23/10 | n/a | 10-2895 | 10-2894 |
| **June 2010** | | | | | |
| MD21-10-19361 | 0–0 | 6/10/10 | FB | — | 10-3374 |
| MD21-10-19349 | 71.1–76.4 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19350 | 153.8–159.7 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19351 | 173.4–179 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19352 | 225.9–232.1 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19353 | 326.6–333.4 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19360 | 326.6–333.4 | 6/10/10 | FD | 10-3373 | 10-3374 |
| MD21-10-19354 | 353.3–359.6 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19355 | 459.4–464.8 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19356 | 559–565 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19357 | 651.3–657.3 | 6/10/10 | n/a | 10-3373 | 10-3374 |
| MD21-10-19358 | 797.2–803.1 | 6/11/10 | n/a | 10-3393 | 10-3392 |
| MD21-10-19359 | 946.2–952.1 | 6/11/10 | n/a | 10-3393 | 10-3392 |

[a] — = Sample not collected.

[b] n/a = Not applicable.

**Table 3.0-1**
**Henry's Law Constants, Groundwater SLs, and**
**Calculated Concentrations Corresponding to Groundwater SLs for Detected VOCs in Pore Gas**

| VOC | Henry's Law Constant[a] (dimensionless) | Groundwater SL (µg/L)[a] | Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m$^3$)[b] |
|---|---|---|---|
| Acetone | 0.0016 | 21,800 | 34,880 |
| Benzene | 0.23 | 5[c] | 1150 |
| Bromodichloromethane | 0.087 | 80[c] | 6960 |
| 2-Butanone | 0.0023 | 7060 | 16,238 |
| Carbon Disulfide | 0.59 | 1040 | 613,600 |
| Carbon Tetrachloride | 1.1 | 5[c] | 5500 |
| Chloroform | 0.15 | 80[c] | 12,000 |
| Cyclohexane | 6.1[d] | 13,000[d] | 79,300,000 |
| 1,4-Dichlorobenzene | 0.1 | 75[c] | 7500 |
| Dichlorodifluoromethane | 14 | 395 | 5,530,000 |
| 1,2-Dichloroethane | 0.048 | 5[c] | 240 |
| 1,1-Dichloroethene | 1.1 | 5[e] | 5500 |
| cis-1,2-Dichloroethene | 0.17 | 70[c] | 11,900 |
| Ethanol | na[f] | na | na |
| 4-Ethyltoluene | na | na | na |
| Methylene chloride | 0.13 | 5[c] | 650 |
| n-Heptane | na | na | na |
| Tetrachloroethene | 0.72 | 5[c] | 3600 |
| Toluene | 0.27 | 750[e] | 202,500 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 22 | 59,200 | 1,302,400,000 |
| 1,1,1-Trichloroethane | 0.71 | 60[e] | 42,600 |
| 1,1,2-Trichloroethane | 0.034 | 5[c] | 170 |
| Trichloroethene | 0.4 | 5[c] | 2000 |
| 1,2,4-Trimethylbenzene | 0.25[d] | 15[d] | 3750 |

[a] Henry's law constants and SLs from NMED (2009, 106420) unless otherwise noted.

[b] Derived from denominator of Equation 3.0-3.

[c] SL is EPA MCL (40 Code of Federal Regulations 141.61).

[d] Henry's law constant and SL from EPA regional screening tables (http://www.epa.gov/region09/superfund/prg).

[e] NMWQCC groundwater standard (20.6.2.3103 New Mexico Administrative Code).

[f] na = Not available.

**Table 4.0-1**
**Summary of Pore-Gas Field-Screening Results, April–June 2010**

| Event ID | Collection Date | Sampling Round | Location ID | Sampling Port Number | Top Depth (ft bgs) | Bottom Depth (ft bgs) | % $CO_2$ | % $O_2$ |
|---|---|---|---|---|---|---|---|---|
| 2776 | 4/20/2010 | 17 | 21-25262 | 1 | 80.0 | 85.0 | 0.8 | 18.7 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 1 | 80.0 | 85.0 | 0.8 | 18.6 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 2 | 115.0 | 120.0 | 0.8 | 19.5 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 2 | 115.0 | 120.0 | 0.4 | 15.6 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 3 | 232.0 | 237.0 | 0.8 | 16.3 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 3 | 232.0 | 237.0 | 0.8 | 15.0 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 4 | 295.0 | 300.0 | 0.9 | 19.0 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 4 | 295.0 | 300.0 | 0.8 | 15.2 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 5 | 329.5 | 334.5 | 0.7 | 19.0 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 5 | 329.5 | 334.5 | 0.6 | 15.3 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 6 | 375.0 | 380.0 | 0.4 | 18.8 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 6 | 375.0 | 380.0 | 0.3 | 15.5 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 7 | 472.3 | 478.0 | 0.3 | 18.4 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 7 | 472.3 | 478.0 | 0.2 | 15.5 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 8 | 572.0 | 577.0 | 0.1 | 18.5 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 8 | 572.0 | 577.0 | 0.0 | 15.9 |
| 2776 | 4/20/2010 | 17 | 21-25262 | 9 | 686.0 | 691.0 | 0.0 | 16.2 |
| 2863 | 6/8/2010 | 18 | 21-25262 | 9 | 686.0 | 691.0 | 0.0 | 16.0 |
| 2776 | 4/27/2010 | 17 | 21-25264 | 1 | 67.5 | 72.5 | 0.8 | 19.8 |
| 2863 | 6/14/2010 | 18 | 21-25264 | 1 | 67.5 | 72.5 | 0.9 | 18.8 |
| 2776 | 4/27/2010 | 17 | 21-25264 | 2 | 150.5 | 155.5 | 0.9 | 19.7 |
| 2863 | 6/14/2010 | 18 | 21-25264 | 2 | 150.5 | 155.5 | 0.8 | 18.7 |
| 2776 | 4/27/2010 | 17 | 21-25264 | 3 | 222.5 | 227.5 | 0.5 | 20.2 |
| 2863 | 6/14/2010 | 18 | 21-25264 | 3 | 222.5 | 227.5 | 0.6 | 18.9 |
| 2776 | 4/27/2010 | 17 | 21-25264 | 4 | 323.0 | 328.0 | 0.2 | 20.2 |
| 2863 | 6/14/2010 | 18 | 21-25264 | 4 | 323.0 | 328.0 | 0.6 | N/R* |
| 2776 | 4/27/2010 | 17 | 21-25264 | 5 | 349.5 | 354.5 | 0.2 | 20.4 |
| 2863 | 6/14/2010 | 18 | 21-25264 | 5 | 349.5 | 354.5 | 0.3 | N/R |
| 2776 | 4/26/2010 | 17 | 21-603058 | 1 | 67.5 | 72.5 | 1.1 | 19.5 |
| 2863 | 6/15/2010 | 18 | 21-603058 | 1 | 67.5 | 72.5 | 1.0 | 19.3 |
| 2776 | 4/26/2010 | 17 | 21-603058 | 3 | 217.0 | 222.0 | 0.7 | 19.9 |
| 2863 | 6/15/2010 | 18 | 21-603058 | 3 | 217.0 | 222.0 | 0.5 | 19.6 |
| 2776 | 4/26/2010 | 17 | 21-603058 | 4 | 242.5 | 247.5 | 0.5 | 20.3 |
| 2863 | 6/15/2010 | 18 | 21-603058 | 4 | 242.5 | 247.5 | 0.3 | 19.6 |
| 2776 | 4/26/2010 | 17 | 21-603058 | 5 | 339.5 | 344.5 | 0.5 | 20.2 |
| 2863 | 6/15/2010 | 18 | 21-603058 | 5 | 339.5 | 344.5 | 0.1 | 19.8 |

**Table 4.0-1 (continued)**

| Event ID | Collection Date | Sampling Round | Location ID | Sampling Port Number | Top Depth (ft bgs) | Bottom Depth (ft bgs) | % $CO_2$ | % $O_2$ |
|---|---|---|---|---|---|---|---|---|
| 2776 | 4/21/2010 | 17 | 21-603059 | 1 | 77.5 | 82.5 | 0.8 | 19.2 |
| 2863 | 6/9/2010 | 18 | 21-603059 | 1 | 77.5 | 82.5 | 0.8 | 19.3 |
| 2776 | 4/21/2010 | 17 | 21-603059 | 3 | 187.5 | 192.5 | 0.8 | 19.2 |
| 2863 | 6/9/2010 | 18 | 21-603059 | 3 | 187.5 | 192.5 | 0.7 | 19.3 |
| 2776 | 4/21/2010 | 17 | 21-603059 | 4 | 229.5 | 234.5 | 1.0 | 19.1 |
| 2863 | 6/9/2010 | 18 | 21-603059 | 4 | 229.5 | 234.5 | 0.6 | 19.4 |
| 2776 | 4/21/2010 | 17 | 21-603059 | 5 | 292.5 | 297.5 | 1.0 | 19.3 |
| 2863 | 6/9/2010 | 18 | 21-603059 | 5 | 292.5 | 297.5 | 0.4 | 19.4 |
| 2776 | 4/21/2010 | 17 | 21-603059 | 6 | 372.5 | 377.5 | 0.4 | 19.8 |
| 2863 | 6/9/2010 | 18 | 21-603059 | 6 | 372.5 | 377.5 | 0.2 | 19.3 |
| 2776 | 4/22/2010 | 17 | 21-607955 | 1 | 71.1 | 76.4 | 1.0 | 19.8 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 1 | 71.1 | 76.4 | 0.9 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 2 | 153.8 | 159.7 | 0.9 | 20.0 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 2 | 153.8 | 159.7 | 0.8 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 3 | 173.4 | 179.0 | 0.9 | 20.2 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 3 | 173.4 | 179.0 | 0.8 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 4 | 225.9 | 232.1 | 0.8 | 20.2 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 4 | 225.9 | 232.1 | 0.7 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 5 | 326.6 | 333.4 | 0.7 | 20.5 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 5 | 326.6 | 333.4 | 0.5 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 6 | 353.3 | 359.6 | 0.5 | 20.6 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 6 | 353.3 | 359.6 | 0.4 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 7 | 459.4 | 464.8 | 0.5 | 20.4 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 7 | 459.4 | 464.8 | 0.3 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 8 | 559.0 | 565.0 | 0.4 | 20.6 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 8 | 559.0 | 565.0 | 0.2 | N/R |
| 2776 | 4/22/2010 | 17 | 21-607955 | 9 | 651.3 | 657.3 | 0.3 | 20.7 |
| 2863 | 6/10/2010 | 18 | 21-607955 | 9 | 651.3 | 657.3 | 0.1 | N/R |
| 2776 | 4/23/2010 | 17 | 21-607955 | 10 | 797.2 | 803.1 | 0.3 | 20.0 |
| 2863 | 6/11/2010 | 18 | 21-607955 | 10 | 797.2 | 803.1 | 0.2 | N/R |
| 2776 | 4/23/2010 | 17 | 21-607955 | 11 | 946.2 | 952.1 | 0.2 | 20.8 |
| 2863 | 6/11/2010 | 18 | 21-607955 | 11 | 946.2 | 952.1 | 0.0 | N/R |

Note: Percent $CO_2$ and $O_2$ readings are within acceptable limits based on LANDTEC calibration procedures described in Appendix B.

* N/R = Not recorded. Oxygen sensor was not functioning properly, and therefore, readings were not recorded.

**Table 4.0-2**
**Barometric Pressure, Relative Humidity, and Temperature at Los Alamos Airport during Sample Collection, April–June 2010**

| Sampling Round | Date/Time of Measurement | Barometric Pressure (in. Hg) | Relative Humidity (%) | Temperature (°F) |
|---|---|---|---|---|
| April 2010 | 4/20/2010 at 08:30 | 30.1 | 76.0 | 48.0 |
| | 4/20/2010 at 15:30 | 30.0 | 36.0 | 61.0 |
| | 4/20/2010 at 16:10 | 30.0 | 34.0 | 63.0 |
| | 4/21/2010 at 12:30 | 29.9 | 36.0 | 61.0 |
| | 4/22/2010 at 08:30 | 29.8 | 93.0 | 37.0 |
| | 4/23/2010 at 08:50 | 29.6 | 56.0 | 37.0 |
| | 4/23/2010 at 09:50 | 29.6 | 65.0 | 37.0 |
| | 4/23/2010 at 10:10 | 29.6 | 65.0 | 37.0 |
| | 4/26/2010 at 09:10 | 30.1 | 24.0 | 54.0 |
| | 4/26/2010 at 10:30 | 30.1 | 28.0 | 55.0 |
| | 4/26/2010 at 11:10 | 30.1 | 27.0 | 57.0 |
| | 4/27/2010 at 08:30 | 30.2 | 70.0 | 41.0 |
| | 4/27/2010 at 10:10 | 30.2 | 57.0 | 46.0 |
| June 2010 | 6/7/2010 at 11:10 | 30.3 | 28.0 | 77.0 |
| | 6/8/2010 at 11:30 | 30.2 | 20.0 | 81.0 |
| | 6/8/2010 at 14:30 | 30.2 | 15.0 | 84.0 |
| | 6/9/2010 at 09:30 | 30.3 | 41.0 | 73.0 |
| | 6/9/2010 at 11:50 | 30.2 | 23.0 | 82.0 |
| | 6/10/2010 at 08:50 | 30.1 | 13.0 | 73.0 |
| | 6/10/2010 at 10:30 | 30.1 | 13.0 | 77.0 |
| | 6/11/2010 at 09:10 | 30.1 | 29.0 | 70.0 |
| | 6/11/2010 at 10:00 | 30.1 | 25.0 | 72.0 |
| | 6/14/2010 at 11:50 | 30.2 | 24.0 | 68.0 |
| | 6/14/2010 at 13:30 | 30.2 | 15.0 | 74.0 |
| | 6/14/2010 at 14:10 | 30.2 | 14.0 | 73.0 |
| | 6/15/2010 at 10:30 | 30.3 | 32.0 | 64.0 |
| | 6/15/2010 at 12:10 | 30.2 | 25.0 | 72.0 |

Note: Data obtained from http://www.srh.noaa.gov/data/obhistory/KLAM.html.

**Table 5.1-1**
**Summary of VOCs Detected in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-25262, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Bromomethane | Butadiene[1,3-] | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Chloromethane | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Hexane | Methanol | Methylene Chloride | n-Heptane | Propanol[2-] | Propylene | Tetrachloroethene | Tetrahydrofuran | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **July 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11294 | 80–85 | 7/14/09 | —[a] | — | — | — | — | — | — | 3.6 | 45 | 730 | — | — | — | 4.9 | — | — | — | — | — | — | — | — | — | — | 1300 | — | — | — | 12 | — | 450 |
| MD21-09-11295 | 115–120 | 7/14/09 | — | — | — | — | — | — | — | — | 44 | 380 | — | — | — | 4.9 | — | — | — | — | — | — | 5.8 | — | — | — | 430 | — | — | — | 12 | — | 270 |
| MD21-09-11296 | 232–237 | 7/14/09 | — | — | 6.3 | — | — | — | — | 3.2 | 220 | 520 | — | — | — | 7.4 | — | 6 | — | — | — | — | 30 | — | — | — | 240 | — | — | 21 | 21 | — | 390 |
| MD21-09-11297 | 295–300 | 7/14/09 | — | — | 11 | — | — | — | — | 8.2 | 830 | 740 | — | — | — | 11 | 5.1 | 29 | 4.5 | — | — | — | 310 | — | — | — | 210 | — | — | 56 | 31 | 16 | 1300 |
| MD21-09-11298 | 329.5–334.5 | 7/14/09 | — | — | 14 | — | — | — | — | 4.6 | 780 | 720 | — | — | — | 8.4 | 9.4 | 35 | 4.8 | — | — | — | 520 | — | — | — | 180 | — | — | 50 | 25 | 44 | 1400 |
| MD21-09-11299 | 375–380 | 7/14/09 | — | 3.9 | 15 | — | — | — | — | 5.1 | 700 | 930 | — | — | 7.4 | 5.1 | 17 | 62 | 5.5 | — | — | — | 1200 | — | — | — | 120 | 3.7 | — | 26 | 14 | 100 | 1500 |
| MD21-09-11300 | 472–478 | 7/14/09 | — | — | — | — | — | 36 | — | 19 | 600 | 1400 | — | — | — | — | 27 | 100 | — | — | — | — | 2100 | — | — | — | 74 | — | — | 18 | — | 200 | 1500 |
| MD21-09-11301 | 572–577 | 7/14/09 | — | — | — | — | — | — | — | — | 190 | 1000 | — | — | — | — | 17 | 71 | — | — | — | — | 1700 | — | — | 13 | 23 | — | — | — | — | 85 | 780 |
| MD21-09-11302 | 686–691 | 7/14/09 | — | 13 | — | — | 7.4 | — | — | 4.8 | — | 120 | — | — | — | — | — | 7.1 | — | — | 5.6 | — | 140 | — | — | 120 | — | — | — | — | — | 21 | 34 |
| **August 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11488 | 80–85 | 8/11/09 | 20 | — | — | — | — | 12 (J) | — | 3.9 | 53 | 880 | — | — | — | 4.5 | — | — | — | — | — | — | 3.1 | — | — | — | 1600 | — | 8.9 | — | 14 | — | 560 |
| MD21-09-11489 | 115–120 | 8/11/09 | 20 | — | — | — | — | — | 3.6 | — | 38 | 350 | — | — | — | — | — | — | — | — | — | — | 4.4 | — | — | — | 400 | — | 5.9 | — | 10 | — | 240 |
| MD21-09-11490 | 232–237 | 8/11/09 | 16 | — | — | — | — | — | — | — | 17 | 110 | — | — | — | — | — | — | — | — | — | — | 7.2 | — | — | — | 29 | — | 12 | — | — | — | 52 |
| MD21-09-11491 | 295–300 | 8/13/09 | 13 | — | 8.5 | — | — | — | 3 | 11 | 680 | 600 | — | — | — | 9 | — | 22 | — | — | — | — | 210 | — | — | — | 180 | — | 8.8 | 54 | 24 | 14 | 1200 |
| MD21-09-11492 | 329.5–334.5 | 8/13/09 | 8.9 | — | 9.6 | — | — | — | — | 12 | 640 | 590 | — | — | — | 6.5 | 7.1 | 28 | 4.2 | — | — | — | 400 | — | — | — | 160 | — | 4.9 | 50 | 20 | 40 | 1200 |
| MD21-09-11493 | 375–380 | 8/11/09 | 37 | — | — | — | — | — | 3.4 | 4.6 | 190 | 310 | — | — | — | — | 5.6 | 18 | — | — | — | — | 400 | — | — | — | 33 | — | 18 | 8.6 | — | 35 | 470 |
| MD21-09-11494 | 472–478 | 8/13/09 | — | 4.8 | 9.1 | — | — | 62 (J) | 4.9 | 14 | 460 | 1100 | — | — | 9.3 | — | — | 78 | — | — | — | — | 1500 | — | — | — | 70 | — | 8 | 16 | — | 170 | 1300 |
| MD21-09-11495 | 572–577 | 8/14/09 | — | — | — | — | — | — | — | — | 260 | 1400 | — | — | — | — | 20 | 94 | — | — | — | — | 2100 | — | — | — | 30 | — | 7.6 | — | — | 120 | 1100 |
| MD21-09-11496 | 686–691 | 8/14/09 | 18 | — | — | — | — | — | 3.9 | 3.6 | 8.6 | 220 | — | — | — | — | — | 17 | — | — | — | — | 260 | — | — | — | — | — | — | — | — | 37 | 70 |
| **September 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-12612 | 80–85 | 9/17/09 | — | — | — | — | — | — | — | 3.3 | 64 | 1000 | — | 3.4 | — | 4.9 | — | — | — | — | — | — | 3 | — | — | — | 2200 | — | — | — | 18 | — | 680 |
| MD21-09-12613 | 115–120 | 9/17/09 | 22 | — | — | — | — | — | — | — | 46 | 400 | — | — | — | 4.3 | — | — | — | — | — | — | 6.3 | — | — | — | 510 | — | 18 | — | 13 | — | 290 |
| MD21-09-12614 | 232–237 | 9/17/09 | 43 | — | — | — | — | — | 4.2 | — | 170 | 430 | — | — | — | 6.2 | — | 4.4 | — | — | — | — | 22 | — | — | — | 210 | — | — | 18 | 17 | — | 310 |
| MD21-09-12615 | 295–300 | 9/17/09 | 27 | — | 6 | — | — | — | 6 | — | 390 | 410 | — | — | — | 6.3 | — | 14 | — | — | — | — | 140 | — | — | — | 110 | — | — | 28 | 14 | 10 | 730 |
| MD21-09-12616 | 329.5–334.5 | 9/17/09 | — | — | 7 | — | — | — | — | 13 | 380 | 400 | — | — | — | 5 | 5.2 | 17 | — | — | — | — | 280 | — | — | — | 100 | — | 3.4 | 26 | 12 | 30 | 760 |
| MD21-09-12617 | 375–380 | 9/17/09 | 28 | — | 8.9 | — | — | — | 3.6 | — | 410 | 590 | — | — | — | — | 10 | 38 | 4 | — | — | 120(J) | 710 | — | — | — | 80 | — | 5 | 18 | 8.3 | 73 | 1000 |
| MD21-09-12618 | 472–478 | 9/17/09 | — | 3.4 | 6.1 | — | — | — | — | 5.3 | 300 | 740 | — | — | 5.7 | — | 14 | 55 | — | — | — | — | 1100 | — | — | — | 46 | — | 4.2 | 9.6 | — | 120 | 840 |
| MD21-09-12619 | 572–577 | 9/17/09 | 36 | — | — | — | — | — | 7.5 | — | 160 | 950 | — | — | — | — | 15 | 63 | — | — | — | — | 1600 | — | — | — | 20 | — | — | — | — | 88 | 720 |
| MD21-09-12620 | 686–691 | 9/17/09 | 24 | — | — | — | — | — | 3 | — | — | 120 | — | — | — | — | — | 11 | — | — | — | — | 140 | — | — | — | — | — | — | — | — | 21 | 44 |
| **October 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-32 | 80–85 | 10/19/09 | 13 | — | — | — | — | — | — | 5.4 | 64 | 1300 | — | — | — | 6.8 | — | — | — | — | — | NA[b] | 5.2 | — | — | — | 2800 | — | — | 11 | 17 | — | 890 |
| MD21-10-33 | 115–120 | 10/19/09 | 31 | — | — | — | — | — | 4.6 | — | 54 | 620 | — | — | — | 6.1 | — | — | — | — | — | NA | 9.6 | — | — | — | 780 | — | — | 9.9 | 15 | — | 460 |
| MD21-10-34 | 232–237 | 10/19/09 | 37 | — | 7 | — | — | — | 3.5 | 4.2 | 280 | 710 | — | — | — | 9.8 | — | 13 | — | — | — | NA | 55 | — | — | — | 350 | — | — | 44 | 25 | — | 620 |
| MD21-10-35 | 295–300 | 10/19/09 | 46 | — | 12 | — | — | — | 5.9 | 7.3 | 770 | 790 | — | — | — | 14 | 4.5 | 39 | 4.6 (J+) | — | — | NA | 350 | — | — | — | 230 | — | — | 88 | 28 | 18 | 1600 |

**Table 5.1-1 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Bromomethane | Butadiene[1,3-] | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Chloromethane | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Hexane | Methanol | Methylene Chloride | n-Heptane | Propanol[2-] | Propylene | Tetrachloroethene | Tetrahydrofuran | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MD21-10-36 | 329.5–334.5 | 10/19/09 | 76 | 3.1 | 14 | — | — | — | 7.2 | 3.5 | 760 | 770 | — | — | — | 10 | 9 | 44 | 5.5 (J+) | — | — | NA | 660 | — | — | — | 190 | — | 5.2 | 76 | 22 | 54 | 1600 |
| MD21-10-37 | 375–380 | 10/19/09 | 45 | — | 15 | — | — | — | — | — | 600 | 890 | — | — | — | — | 16 | 75 | — | — | — | NA | 1300 | — | — | — | 120 | — | 6.9 | 42 | 12 | 120 | 1700 |
| MD21-10-38 | 472–478 | 10/19/09 | 23 | 6.7 | 13 | — | — | — | — | 6.9 | 510 | 1400 | — | — | 11 | — | 27 | 130 | — | — | — | NA | 2400 | — | — | — | 84 | — | 7.4 | 27 | — | 240 | 1700 |
| MD21-10-39 | 572–577 | 10/19/09 | — | — | — | — | — | — | — | — | 230 | 1200 | — | — | 13 | — | 21 | 65 (J) | — | — | — | NA | 1800 (J-) | — | — | — | 32 | — | — | — | — | 130 | 1000 |
| MD21-10-40 | 686–691 | 10/19/09 | 31 | — | — | 6.7 | — | — | 6.4 | — | 16 | 290 | — | — | — | — | — | 20 (J) | — | — | — | NA | 190 (J-) | — | — | — | — | — | — | — | — | 43 | 98 |
| **November 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-5007 | 80–85 | 11/17/09 | — | — | — | — | — | — | — | — | 61 | 1100 | — | 3.2 (J) | — | 5.5 | — | — | — | — | 5.5 | NA | — | — | — | — | 2200 | — | 4.6 | — | 17 | — | 600 |
| MD21-10-5008 | 115–120 | 11/17/09 | — | — | — | — | — | — | — | — | 48 | 470 | — | — | — | 5 | — | — | — | — | — | NA | 7.2 | — | — | — | 510 | — | — | — | 14 | — | 290 |
| MD21-10-5009 | 232–237 | 11/17/09 | — | — | — | — | — | — | — | — | 140 | 380 | — | — | — | 5.7 | — | 4.5 | — | — | — | NA | 24 | — | — | — | 170 | — | — | 14 (J-) | 14 | — | 270 |
| MD21-10-5010 | 295–300 | 11/17/09 | — | — | — | — | — | — | — | — | 320 | 360 | — | — | — | 5.8 | — | 12 | — | — | — | NA | 110 | — | — | — | 92 | — | — | 21 (J-) | 12 | — | 590 |
| MD21-10-5011 | 329.5–334.5 | 11/17/09 | 9.7 | — | 8.2 | — | — | — | — | — | 410 | 430 | — | — | — | 6.3 | 5.6 | 19 | — | — | — | NA | 320 | — | — | — | 100 | — | 3.3 | 26 (J-) | 12 | 31 | 760 |
| MD21-10-5012 | 375–380 | 11/17/09 | 9.2 | — | 7.4 | — | — | — | — | — | 310 | 490 | — | — | — | — | 7.9 | 32 | — | — | — | NA | 630 | — | — | — | 55 | — | 3.7 | 13 (J-) | 6.2 | 55 | 740 |
| MD21-10-5013 | 472–478 | 11/17/09 | — | — | — | — | — | — | — | 9.7 | 360 | 960 | — | — | — | — | 16 | 73 | — | — | — | NA | 1600 | — | — | — | 51 | — | — | — | — | 140 | 1000 |
| MD21-10-5014 | 572–577 | 11/17/09 | — | — | — | — | — | — | — | — | 100 | 740 | — | — | — | — | 12 | 48 | — | — | — | NA | 1400 | — | — | — | 13 | — | — | — | — | 66 | 500 |
| MD21-10-5015 | 686–691 | 11/17/09 | 25 | — | — | — | — | — | 3.8 | — | 6.4 | 120 | — | — | — | — | — | 10 | — | — | — | NA | 160 | — | — | — | — | — | — | — | — | 20 | 43 |
| **December 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-8520 | 80–85 | 12/15/09 | 100 | — | — | — | — | — | 5.1 | 15 | 54 | 950 | — | 2.8 | — | 4.7 | — | — | — | — | — | NA | 3.1 | — | — | — | 2000 | — | 3.8 | — | 15 | — | 560 |
| MD21-10-8521 | 115–120 | 12/15/09 | — | — | — | — | — | — | — | — | 47 | 450 | — | — | — | 4.8 | — | — | — | — | — | NA | 6.7 | — | 170 | — | 520 | — | — | — | 13 | — | 300 |
| MD21-10-8522 | 232–237 | 12/15/09 | — | — | — | — | — | — | 2.7 | 2.7 | 200 | 500 | — | — | — | 6.4 | — | 4.1 | — | — | — | NA | 29 | — | — | — | 250 | — | — | 18 | 20 | — | 370 |
| MD21-10-8523 | 295–300 | 12/15/09 | — | — | 8.7 | — | — | — | — | — | 640 | 610 | — | — | — | 8.9 | 3.5 | 20 | — | — | 9.2 | NA | 130 | — | — | — | 190 | — | — | 44 | 24 | 15 | 1100 |
| MD21-10-8524 | 329.5–334.5 | 12/15/09 | — | — | 11 | — | — | — | 6.1 | 3 | 540 | 550 | 14 | — | — | 5.5 | 7.9 | 20 | 4.1 | — | 9.8 | NA | 210 | 4.7 | — | — | 160 | — | — | 25 | 17 | 41 | 1100 |
| MD21-10-8525 | 375–380 | 12/15/09 | — | 3.1 | 12 | — | — | — | 3.2 | — | 550 | 760 | — | — | 6.4 | — | 14 | 44 | 4.3 | — | — | NA | 930 | — | — | — | 100 | — | 5.3 | 22 | 11 | 90 | 1200 |
| MD21-10-8526 | 472–478 | 12/15/09 | — | — | — | — | — | — | — | — | 500 | 1200 | — | — | — | — | 26 | 75 | — | — | 11 | NA | 1800 | — | — | — | 72 | — | — | 15 | — | 200 | 1400 |
| MD21-10-8527 | 572–577 | 12/15/09 | — | 5.6 (J) | — | — | — | — | — | — | 270 | 1400 | — | — | 10 | — | 23 | 87 | — | — | — | NA | 2300 | — | — | — | 33 | — | — | — | — | 110 | 1200 |
| MD21-10-8528 | 686–691 | 12/15/09 | — | — | — | — | — | — | — | 6.4 | 24 | 360 | — | — | — | — | — | 31 | — | — | — | NA | 290 | — | — | 10 | — | — | — | — | — | 54 | 150 |
| **January 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-11413 | 80–85 | 1/21/10 | — | — | — | — | — | — | — | — | 57 | 1100 | — | 3.7 | — | 4.9 | — | — | — | — | — | NA | 3.2 | — | — | — | 2300 | — | — | 7.1 | 16 | — | 700 |
| MD21-10-11414 | 115–120 | 1/21/10 | — | — | — | — | — | — | — | — | 56 | 570 | — | — | — | 4.9 | — | — | — | — | — | NA | 8.2 | — | — | — | 710 | — | — | 7.9 | 15 | — | 400 |
| MD21-10-11415 | 232–237 | 1/21/10 | 7.8 | — | — | — | — | — | — | — | 230 | 540 | — | — | — | 7 | — | 8.2 | — | — | — | NA | 31 | — | — | — | 260 | — | — | 28 | 20 | — | 440 |
| MD21-10-11416 | 295–300 | 1/21/10 | — | — | 6.9 | — | — | — | — | — | 490 | 510 | — | — | — | 7 | — | 20 | 3.3 | — | — | NA | 120 | — | — | — | 150 | — | — | 43 | 18 | 12 | 980 |
| MD21-10-11417 | 329.5–334.5 | 1/21/10 | 210 | — | 8.8 | — | — | — | 3.8 | — | 570 | 560 | — | — | — | 6.4 | 6 | 28 | 4.4 | 130 | 8.7 | NA | 380 | 27 | — | — | 150 | — | — | 39 | 18 | 37 | 1100 |
| MD21-10-11418 | 375–380 | 1/21/10 | — | 2.7 | 9.6 | — | — | — | — | — | 430 | 650 | — | — | 5.6 | — | 9.3 | 45 | 4.2 | — | — | NA | 750 | — | — | — | 84 | — | 4.9 | 22 | 8.7 | 75 | 1100 |
| MD21-10-11419 | 472–478 | 1/21/10 | — | — | 12 | — | — | — | — | — | 500 | 1300 | — | — | 11 | — | 23 | 95 | — | — | — | NA | 1900 | — | — | — | 79 | — | 7 | 18 | — | 220 | 1500 |
| MD21-10-11420 | 572–577 | 1/21/10 | — | — | — | — | — | — | — | — | 240 | 1400 | — | — | — | — | 21 | 100 | — | — | — | NA | 2200 | — | — | — | 32 | — | — | — | — | 130 | 1100 |
| MD21-10-11421 | 686–691 | 1/21/10 | 15 | 2.7 | — | — | — | — | — | 5.4 | 25 | 440 | — | — | — | — | — | 49 | — | — | — | NA | 520 | — | — | — | 6.1 | — | — | — | — | 61 | 200 |

**Table 5.1-1 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Bromomethane | Butadiene[1,3-] | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Chloromethane | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Hexane | Methanol | Methylene Chloride | n-Heptane | Propanol[2-] | Propylene | Tetrachloroethene | Tetrahydrofuran | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **February 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-12278 | 80–85 | 2/10/10 | — | — | — | — | — | — | — | — | 72 | 1200 | — | — | — | — | — | — | — | — | — | NA | — | — | — | — | 2400 | — | — | — | 19 | — | 720 |
| MD21-10-12279 | 115–120 | 2/10/10 | 8.6 | — | — | — | — | — | — | — | 60 | 560 | — | — | — | 6.2 | — | — | — | — | — | NA | 7.8 | — | — | — | 610 | — | — | — | 16 | — | 380 |
| MD21-10-12280 | 232–237 | 2/10/10 | — | — | 6.6 | — | — | — | — | — | 320 | 660 | — | — | — | 9 | — | 8.7 | — | — | — | NA | 36 | — | — | — | 280 | — | — | 29 | 26 | — | 520 |
| MD21-10-12281 | 295–300 | 2/10/10 | — | — | 11 | — | — | — | — | — | 800 | 700 | — | — | — | 11 | 3.7 | 24 | 4.1 | — | — | NA | 160 | — | — | — | 190 | — | — | 55 | 28 | 16 | 1300 |
| MD21-10-12282 | 329.5–334.5 | 2/10/10 | — | — | 13 | — | — | — | — | — | 840 | 720 | — | — | 5.2 | 9.5 | 8.6 | 32 | 4.9 | — | — | NA | 460 | — | — | — | 170 | — | 4.5 | 49 | 24 | 41 | 1400 |
| MD21-10-12283 | 375–380 | 2/10/10 | — | 3.7 | 15 | — | — | — | — | — | 670 | 920 | — | — | 8 | 5.4 | 16 | 58 | 4.9 | — | — | NA | 1000 | — | — | — | 110 | — | 6.6 | 28 | 14 | 100 | 1500 |
| MD21-10-12284 | 472–478 | 2/10/10 | — | — | 12 | — | — | — | — | — | 550 | 1300 | — | — | 12 | — | 25 | 87 | — | — | — | NA | 1800 | — | — | — | 75 | — | 8 | 18 | — | 190 | 1400 |
| MD21-10-12285 | 572–577 | 2/10/10 | — | — | — | — | — | — | — | — | 310 | 1600 | — | — | 14 | — | 26 | 98 | — | — | — | NA | 2300 | — | — | — | 40 | — | — | — | — | 130 | 1200 |
| MD21-10-12286 | 686–691 | 2/10/10 | — | 2.8 | — | — | — | — | — | — | 43 | 550 | — | — | 5.3 | — | — | 56 | — | — | — | NA | 600 | — | — | — | 5.9 (J) | — | — | — | — | 63 | 220 |
| **March 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-13989 | 80–85 | 3/17/10 | — | — | — | — | — | — | — | — | 63 | 1300 | — | — | — | 5.6 | — | — | — | — | — | NA | 3.9 | — | — | — | 2100 | — | — | — | 18 | — | 660 |
| MD21-10-13990 | 115–120 | 3/17/10 | — | — | — | — | — | — | — | — | 44 | 560 | — | — | — | 4.8 | — | — | — | — | — | NA | 8.4 | — | — | 6.7 | 500 | — | — | — | 12 | — | 320 |
| MD21-10-13991 | 232–237 | 3/17/10 | — | — | — | — | — | — | — | — | 260 | 680 | — | — | — | 7.8 | — | 7 | — | — | — | NA | 39 | — | — | — | 290 | — | — | 22 | 25 | — | 480 |
| MD21-10-13992 | 295–300 | 3/17/10 | — | — | 8.5 | — | — | — | — | — | 670 | 720 | — | — | — | 9.4 | — | 20 | 4.4 | — | — | NA | 150 | — | — | — | 180 | — | — | 42 | 26 | 15 | 1100 |
| MD21-10-13993 | 329.5–334.5 | 3/17/10 | — | — | 10 | — | — | — | 2.9 | — | 620 | 660 | — | — | — | 6.7 | 6.3 | 24 | 4.8 | — | — | NA | 410 | — | — | — | 150 | — | 4.8 | 32 | 20 | 39 | 1100 |
| MD21-10-13994 | 375–380 | 3/17/10 | — | 4 | 12 | — | — | — | — | — | 490 | 800 | — | — | 7.2 | — | 12 | 39 | 5 | — | — | NA | 880 | — | — | — | 100 | — | 6.7 | 18 | 10 | 96 | 1300 |
| MD21-10-13995 | 472–478 | 3/17/10 | 12 | 5.5 | 10 | — | — | — | 6.4 | 34 | 410 | 1200 | — | — | 12 | — | 21 | 62 | 4.7 | — | — | NA | 1600 | — | — | — | 73 | — | 11 | 12 | — | 210 | 1300 |
| MD21-10-13996 | 572–577 | 3/17/10 | 29 | 6.6 | — | — | — | — | 5.7 | — | 240 | 1500 | — | — | 13 | — | 21 | 80 | — | — | — | NA | 2200 | — | — | — | 35 | — | — | — | — | 140 | 1200 |
| MD21-10-13997 | 686–691 | 3/17/10 | 12 | 2.9 | — | — | — | — | 3.2 | 4 | 34 | 500 | — | — | — | — | — | 41 | — | — | — | NA | 520 | — | — | — | — | — | 4 | — | — | 57 | 190 |
| **April 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-15953 | 80–85 | 4/20/10 | — | — | — | — | — | — | — | — | 63 | 1200 | — | — | — | — | — | — | — | — | — | NA | — | — | — | — | 2800 | — | — | — | 17 | — | 740 |
| MD21-10-15954 | 115–120 | 4/20/10 | — | — | — | — | — | — | — | — | 52 | 530 | — | — | — | 5 | — | — | — | — | — | NA | 6.1 | — | — | — | 710 | — | — | — | 13 | — | 380 |
| MD21-10-15955 | 232–237 | 4/20/10 | 10 | — | 5.7 | — | — | — | — | — | 280 | 670 | — | — | — | 8.5 | — | 7 | — | — | — | NA | 36 | — | — | — | 290 | — | — | 25 | 24 | — | 500 |
| MD21-10-15956 | 295–300 | 4/20/10 | — | — | 8.3 | — | — | — | — | — | 710 | 630 | — | — | — | 9.3 | — | 18 | — | — | — | NA | 97 | — | — | — | 210 | — | — | 49 | 24 | 17 | 1200 |
| MD21-10-15957 | 329.5–334.5 | 4/20/10 | 10 | — | 10 | — | — | — | — | — | 680 | 610 | — | — | — | 6.6 | 6.6 | 23 | 3.8 | — | — | NA | 340 | — | — | — | 170 | — | 4.6 | 41 | 19 | 44 | 1200 |
| MD21-10-15958 | 375–380 | 4/20/10 | — | 3.5 | 11 | — | — | — | — | 4.9 | 590 | 780 | — | — | — | — | 12 | 42 | 4 | — | — | NA | 760 | — | — | — | 120 | — | 5.7 | 26 | 11 | 100 | 1300 |
| MD21-10-15959 | 472–478 | 4/20/10 | — | 3.6 | 7.2 | — | — | — | — | — | 370 | 860 | — | — | — | — | 16 | 53 | — | — | — | NA | 1000 | — | — | — | 61 | — | 5 | 13 | 9 | 170 | 1000 |
| MD21-10-15960 | 572–577 | 4/20/10 | — | 3.7 | — | — | — | — | — | — | 190 | 960 | — | — | — | — | 13 | 56 | — | — | — | NA | 1200 | — | — | — | 26 | — | — | — | — | 98 | 800 |
| MD21-10-15961 | 686–691 | 4/20/10 | — | — | — | — | — | — | — | — | 18 | 240 | — | — | — | — | — | 20 | — | — | — | NA | 220 | — | — | — | — | — | — | — | — | 30 | 100 |
| **June 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-19336 | 80–85 | 6/8/10 | — | — | — | — | — | — | — | — | 94 | 2000 | — | — | — | — | — | — | — | — | — | NA | — | — | — | — | 3700 | — | — | — | — | — | 910 |
| MD21-10-19337 | 115–120 | 6/8/10 | — | — | — | — | — | — | — | — | 57 (J) | 570 | — | — | — | 6.1 (J) | — | — | — | — | — | NA | 7.8 | — | — | — | 520 | — | — | — | 14 | — | 370 |
| MD21-10-19338 | 232–237 | 6/8/10 | 12 | — | 6.5 | — | — | — | — | 8 | 380 (J) | 740 | — | — | — | 11 (J) | — | 8.3 | — | — | — | NA | 40 | — | — | — | 300 | — | — | 30 | 32 | — | 600 |
| MD21-10-19339 | 295–300 | 6/8/10 | — | — | 10 | — | — | — | — | — | 950 (J) | 790 | — | — | — | 13 (J) | 4.3 | 24 | — | — | — | NA | 120 | — | — | — | 190 | — | — | 55 | 32 | 15 | 1300 |
| MD21-10-19340 | 329.5–334.5 | 6/8/10 | — | — | 12 | — | — | — | — | 4.4 | 900 (J) | 760 | — | — | — | 9.5 (J) | 9.1 | 31 | 4.2 | — | — | NA | 440 | — | — | — | 160 | — | 4.6 | 46 | 27 | 39 | 1400 |

**Table 5.1-1 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Bromomethane | Butadiene[1,3-] | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Chloromethane | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Hexane | Methanol | Methylene Chloride | n-Heptane | Propanol[2-] | Propylene | Tetrachloroethene | Tetrahydrofuran | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MD21-10-19341 | 375–380 | 6/8/10 | 14 | 3.2 | 15 | — | — | — | — | — | 750 (J) | 930 | — | — | 6.9 | 5.2 (J) | 17 | 51 | 4.5 | — | — | NA | 980 | — | — | — | 98 | — | 6.1 | 27 | 14 | 92 | 1400 |
| MD21-10-19342 | 472–478 | 6/8/10 | — | — | — | — | — | — | — | 9.1 | 670 (J) | 1500 | — | — | 12 | — | 29 | 89 | — | — | — | NA | 2000 | — | — | — | 67 | — | — | 19 | — | 200 | 1600 |
| MD21-10-19343 | 572–577 | 6/8/10 | 9.5 | — | — | — | — | — | — | — | 150 (J) | 840 | — | — | 6.4 | — | 14 | 46 | — | — | — | NA | 1300 | — | — | — | 14 | — | — | — | — | 62 | 590 |
| MD21-10-19344 | 686–691 | 6/8/10 | 15 | — | — | — | — | — | — | — | 38 (J) | 450 | — | — | — | — | — | 40 | — | — | — | NA | 450 | — | — | — | — | — | — | — | — | 38 | 190 |

Notes: Results are in µg/m$^3$. See Appendix A for data qualifier definitions.

[a] — = Not detected.

[b] NA=Not analyzed.

**Table 5.1-2**
**Summary of VOCs Detected in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-25264, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chlorodifluoromethane | Chloroform | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Ethanol | Ethyltoluene[4-] | Hexane | Methylene Chloride | n-Heptane | Propanol[2-] | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene | Trimethylbenzene[1,2,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **July 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11283 | 67.5–72.5 | 7/17/09 | —* | — | — | — | — | 180 | — | 500 | — | — | 17 | — | — | — | — | — | 18 | — | — | 3600 | — | — | 32 | — | 1300 | — |
| MD21-09-11284 | 150.5–155.5 | 7/17/09 | — | — | — | — | — | 210 | — | 470 | — | — | 14 | 3.9 | — | — | — | — | 210 | — | — | 570 | — | 8.3 | 30 | — | 650 | — |
| MD21-09-11285 | 222.5–227.5 | 7/17/09 | — | — | — | — | — | 230 | — | 420 | — | — | 8.6 | 9.1 | 3.8 | — | — | — | 570 | — | — | 160 | — | — | 17 | — | 510 | — |
| MD21-09-11286 | 323–328 | 7/17/09 | — | — | — | 9.6 | — | 310 | — | 570 | — | 5.2 (J) | 7.1 | 16 | 7.8 | — | — | — | 1100 | — | — | 50 | — | 8.3 | 7.1 | — | 570 | — |
| MD21-09-11287 | 349.5–354.5 | 7/17/09 | — | — | — | — | — | 180 | — | 460 | — | — | — | 17 | 6.1 | — | — | — | 1000 | — | — | 18 | — | — | — | — | 370 | — |
| **August 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11477 | 67.5–72.5 | 8/19/09 | — | 11 | — | — | 8.2 | 140 | — | 380 | — | — | 12 | — | — | — | — | — | 14 | — | — | 3400 | 16 | — | 24 | — | 1000 | — |
| MD21-09-11478 | 150.5–155.5 | 8/19/09 | 45 | — | — | 5.4 | — | 160 | — | 370 | 4.8 | — | 9.9 | — | — | — | — | — | 150 | — | — | 500 | — | 8.2 | 23 | — | 540 | — |
| MD21-09-11479 | 222.5–227.5 | 8/19/09 | — | — | 5.9 | — | 4.3 | 340 | — | 510 | 6.3 | — | 9.2 | 10 | 5.7 | — | — | — | 630 | — | — | 230 | — | 12 | 23 | — | 690 | — |
| MD21-09-11480 | 323–328 | 8/19/09 | — | — | — | — | — | 460 | — | 730 | — | — | — | 18 | 8.7 | — | — | — | 1300 | — | — | 76 | — | 15 | 10 | — | 800 | — |
| MD21-09-11481 | 349.5–354.5 | 8/19/09 | — | — | — | — | — | 430 | — | 950 | — | — | — | 26 | 13 | — | — | — | 1900 | — | — | 36 | — | — | — | — | 840 | — |
| **September 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-12605 | 67.5–72.5 | 9/16/09 | — | — | — | 4.3 | 41 | 100 | — | 310 | — | — | 11 | — | — | — | — | — | 11 | — | — | 2600 | — | — | 19 | — | 840 | — |
| MD21-09-12606 | 150.5–155.5 | 9/16/09 | 12 | — | — | 2.9 | — | 140 | — | 330 | 4.3 | — | 8.6 | — | — | — | — | — | 140 | — | — | 460 | — | 7.4 | 22 | — | 500 | — |
| MD21-09-12607 | 222.5–227.5 | 9/16/09 | 17 | — | — | 2.9 | — | 210 | — | 360 | 3.9 | — | 6.8 | 7.7 | 3.9 | — | — | — | 480 | — | — | 160 | — | 8.2 | 16 | — | 480 | — |
| MD21-09-12608 | 323–328 | 9/16/09 | 10 | — | — | — | — | 230 | — | 420 | — | — | 5.1 | 11 | 5.6 | — | — | — | 800 | — | — | 42 | — | 7.9 | 5.7 | — | 440 | — |
| MD21-09-12609 | 349.5–354.5 | 9/16/09 | — | — | — | — | — | 200 | — | 520 | — | — | — | 16 | 7.2 | — | — | — | 1100 | — | — | 19 | — | — | — | — | 440 | — |
| **October 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-25 | 67.5–72.5 | 10/16/09 | 9 | — | — | — | — | 87 | — | 320 | — | — | 9.3 | — | — | — | — | — | 16 | — | — | 2400 | — | 8.1 | 16 | — | 910 | — |
| MD21-10-26 | 150.5–155.5 | 10/16/09 | 57 | — | — | 5 | — | 140 | — | 390 | 4.4 | — | 11 | — | 5.1 | — | — | — | 210 | — | — | 500 | — | 10 | 21 | — | 600 | — |
| MD21-10-27 | 222.5–227.5 | 10/16/09 | 48 | — | — | 5.3 | — | 130 | — | 320 | — | — | 5.8 | 7.2 | 4.3 | 21 | — | — | 560 | — | — | 110 | — | — | 9.9 | — | 380 | — |
| MD21-10-28 | 323–328 | 10/16/09 | 12 | — | — | — | — | 110 | — | 280 | — | — | — | 8.2 | 4.6 | 25 | — | — | 720 | — | — | 22 | — | — | — | — | 290 | — |
| MD21-10-29 | 349.5–354.5 | 10/16/09 | 11 | — | — | — | — | 73 | — | 280 | — | — | — | 11 | 4.2 | 23 | — | — | 860 | — | — | 9.1 | — | — | — | — | 240 | — |
| **November 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-5002 | 67.5–72.5 | 11/19/09 | — | — | — | — | — | 120 | — | 350 | — | — | 12 | — | — | — | — | — | 13 | — | — | 3000 | — | — | 21 | — | 900 | — |
| MD21-10-5003 | 150.5–155.5 | 11/19/09 | 12 | — | — | — | — | 150 | — | 370 | 4.2 | — | 11 | — | — | — | — | — | 160 | — | — | 460 | — | — | 21 | — | 480 | — |
| MD21-10-5004 | 222.5–227.5 | 11/19/09 | 15 | — | — | 3.5 | — | 310 | — | 520 | 5.1 | — | 11 | 9.5 | 5.6 | — | — | — | 700 | — | — | 200 | — | 12 | 22 | 5.6 | 650 | — |
| MD21-10-5005 | 323–328 | 11/19/09 | 17 | — | — | — | — | 400 | — | 750 | — | — | 8.3 | 17 | 10 | — | — | — | 1500 | — | — | 65 | — | 13 | 9.4 | — | 750 | — |
| MD21-10-5006 | 349.5–354.5 | 11/19/09 | — | — | — | — | — | 370 | — | 950 | — | — | — | 24 | 13 | — | — | — | 2200 | — | — | 32 | — | — | — | — | 770 | — |
| **December 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-8509 | 67.5–72.5 | 12/22/09 | — | — | — | — | — | 120 | — | 380 | — | — | 12 | — | — | — | — | — | 15 | — | — | 3300 | — | — | 22 | — | 990 | — |
| MD21-10-8510 | 150.5–155.5 | 12/22/09 | 16 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

**Table 5.1-2 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chlorodifluoromethane | Chloroform | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Ethanol | Ethyltoluene[4-] | Hexane | Methylene Chloride | n-Heptane | Propanol[2-] | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene | Trimethylbenzene[1,2,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MD21-10-8511 | 222.5–227.5 | 12/22/09 | — | — | 5.8 | — | — | 300 | — | 500 | 5.7 | — | 10 | 10 | 5.6 | — | — | 11 | 690 | 4.1 | — | 220 | — | 10 | 22 | — | 650 | — |
| MD21-10-8512 | 323–328 | 12/22/09 | — | — | — | — | — | 400 | — | 720 | — | — | — | 20 | 8.9 | — | — | — | 1300 | — | — | 74 | — | — | 9.8 | — | 760 | — |
| MD21-10-8513 | 349.5–354.5 | 12/22/09 | — | — | — | — | — | 88 | — | 220 | — | — | — | 6.6 | — | — | — | 8.9 | 500 | 3.6 | — | 53 | — | — | — | — | 190 | — |
| **January 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-11406 | 67.5–72.5 | 1/28/10 | — | — | — | — | — | 120 | — | 390 | — | — | 14 | — | — | — | — | — | 15 | — | — | 2700 | — | — | 22 | — | 1000 | — |
| MD21-10-11407 | 150.5–155.5 | 1/28/10 | 8.9 | — | — | — | — | 180 | 30 | 450 | 5.4 | — | 12 | — | — | — | — | — | 180 | — | 14 | 490 | 6.3 | 8.6 | 25 | — | 620 | — |
| MD21-10-11408 | 222.5–227.5 | 1/28/10 | — | — | 7.9 | — | — | 390 | — | 610 | 6.1 | — | 12 | 14 | 6 | 11 | — | — | 770 | — | — | 210 | — | 12 | 27 | 5 | 820 | — |
| MD21-10-11409 | 323–328 | 1/28/10 | — | — | — | — | — | 540 | — | 980 | — | — | 9.8 | 27 | 11 | — | — | — | 1800 | — | — | 76 | — | 17 | 13 | — | 1000 | — |
| MD21-10-11410 | 349.5–354.5 | 1/28/10 | — | — | — | — | — | 510 | — | 1200 | — | — | — | 40 | 15 | — | — | — | 2700 | — | — | 36 | — | — | — | — | 1100 | — |
| **February 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-12271 | 67.5–72.5 | 2/16/10 | 14 | — | — | — | — | 83 | — | 250 | — | — | 11 | — | — | — | — | — | 8.6 | — | — | 2000 | — | — | 16 | — | 710 | — |
| MD21-10-12272 | 150.5–155.5 | 2/16/10 | — | — | — | — | — | 190 | — | 410 | 3.7 | — | 13 | 3.7 | — | — | — | — | 140 | — | — | 500 | — | 7.9 | 26 | — | 600 | — |
| MD21-10-12273 | 222.5–227.5 | 2/16/10 | — | — | 8.2 | — | — | 350 | — | 520 | 4.7 | — | 11 | 12 | 4.4 | — | — | — | 620 | — | — | 200 | — | 11 | 25 | — | 720 | — |
| MD21-10-12274 | 323–328 | 2/16/10 | — | — | — | — | — | 450 | — | 750 | — | — | 8.6 | 21 | 10 | — | — | — | 1200 | — | — | 62 | — | 13 | 10 | — | 860 | — |
| MD21-10-12275 | 349.5–354.5 | 2/16/10 | — | — | — | — | — | 440 | — | 1000 | — | — | — | 34 | 11 | — | — | — | 1900 | — | — | 34 | — | — | — | — | 920 | — |
| **March 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-13984 | 67.5–72.5 | 3/23/10 | — | — | — | — | — | 110 | — | 420 | — | — | 12 | — | — | — | — | — | 14 | — | — | 3000 | — | — | 23 | — | 1000 | — |
| MD21-10-13985 | 150.5–155.5 | 3/23/10 | — | — | — | — | — | 150 | — | 430 | 5.7 | — | 11 | — | — | — | — | — | 150 | — | — | 500 | — | — | 23 | — | 530 | — |
| MD21-10-13986 | 222.5–227.5 | 3/23/10 | — | — | 6.1 | — | — | 300 | — | 560 | 7.1 | — | 9.5 | 9.3 | 4.8 | 8.5 | — | — | 650 | — | — | 220 | — | 9 | 22 | 5.3 | 670 | — |
| MD21-10-13987 | 323–328 | 3/23/10 | 9.6 | — | — | — | — | 390 | — | 780 | — | 7.8 | 7 | 17 | 8.1 | — | — | — | 1200 | — | — | 72 | 3.8 | 10 | 9.5 | — | 800 | — |
| MD21-10-13988 | 349.5–354.8 | 3/23/10 | — | — | — | — | — | 330 | — | 940 | — | 10 | — | 24 | 10 | — | — | — | 1800 | — | — | 34 | — | — | — | — | 830 | — |
| **April 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-15946 | 67.5–72.5 | 4/27/10 | — | — | — | — | — | 110 | — | 380 | — | — | 12 | — | — | — | 10 | — | 13 | — | — | 3000 | — | — | 22 | — | 980 | 16 |
| MD21-10-15947 | 150.5–155.5 | 4/27/10 | 17 | — | — | 5.7 | — | 150 | — | 370 | 3.8 | — | 10 | — | — | — | — | — | 130 | — | — | 500 | — | — | 22 | — | 540 | — |
| MD21-10-15948 | 222.5–227.5 | 4/27/10 | 9.4 | — | — | — | — | 200 | — | 370 | — | — | 7.2 | 7.5 | — | — | — | — | 480 | — | — | 140 | — | 6.7 (J) | 14 | — | 470 | — |
| MD21-10-15949 | 323–328 | 4/27/10 | — | — | — | — | — | 170 | — | 370 | — | — | 4.4 | 9 | 3.7 | — | — | — | 630 | — | — | 28 | — | — | — | — | 370 | — |
| MD21-10-15950 | 349.5–354.5 | 4/27/10 | — | — | — | — | — | 150 | — | 440 | — | — | — | 14 | 4.6 | — | — | — | 900 | — | — | 14 | — | — | — | — | 360 | — |
| **June 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-19329 | 67.5–72.5 | 6/14/10 | — | — | — | — | — | 120 | — | 430 | — | — | — | — | — | — | — | — | — | — | — | 3300 | — | — | — | — | 890 | — |
| MD21-10-19330 | 150.5–155.5 | 6/14/10 | — | — | — | — | — | 140 | — | 430 | — | — | — | — | — | — | — | — | 180 | — | — | 520 | — | — | — | — | 480 | — |
| MD21-10-19331 | 222.5–227.5 | 6/14/10 | — | — | — | — | — | 290 | — | 540 | — | — | — | — | — | — | — | — | 740 | — | — | 210 | — | — | — | — | 560 | — |
| MD21-10-19332 | 323–328 | 6/14/10 | — | — | — | — | — | 390 | — | 780 | — | — | — | — | — | — | — | — | 1400 | — | — | 65 | — | — | — | — | 650 | — |
| MD21-10-19333 | 349.5–354.5 | 6/14/10 | — | — | — | — | — | 340 | — | 920 | — | — | — | — | — | — | — | — | 2000 | — | — | — | — | — | — | — | 600 | — |

Notes: Results are in µg/m$^3$. See Appendix A for data qualifier definitions.
* — = Not detected.

**Table 5.1-3**
**Summary of VOCs Detected in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-603058, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Dichlorobenzene[1,2-] | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Hexane | Methylene Chloride | n-Heptane | Propylene | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **July 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11278 | 67.5–72.5 | 7/16/09 | 29 | —* | — | 4.8 | — | 68 | 520 | — | — | 5.8 | — | — | — | — | — | 5.6 | — | — | 740 | 14 | — | 20 | — | 330 |
| MD21-09-11280 | 217–222 | 7/16/09 | — | 3.1 | — | — | — | 310 | 670 | — | — | 6.7 | 7.8 | 8 | — | — | — | 420 | — | — | 210 | 3.7 | 17 | 27 | 14 | 720 |
| MD21-09-11281 | 242.5–247.5 | 7/16/09 | 15 | — | — | 5.4 | 29 | 200 | 460 | 83 | 16 | 5.2 | 8.9 | 6.2 | — | — | — | 620 | — | — | 68 | 4.8 | 9.5 | 12 | 17 | 1200 |
| MD21-09-11282 | 339.5–344.5 | 7/16/09 | 22 | — | — | — | — | 350 | 730 | — | 8.9 | 5 | 17 | 11 | — | — | — | 1300 | — | — | 44 | — | 16 | 7.7 | 18 | 700 |
| **August 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11472 | 67.5–72.5 | 8/18/09 | — | — | — | — | — | 58 | 440 | — | — | 4.9 | — | — | — | — | — | 3.6 | — | — | 710 | 6.7 | — | 17 | — | 290 |
| MD21-09-11473 | 217–222 | 8/18/09 | 16 | — | — | — | — | 340 | 670 | — | — | 6.6 | 5.3 | 8.5 | — | — | — | 380 | — | — | 250 | — | 24 | 30 | 13 | 770 |
| MD21-09-11474 | 242.5–247.5 | 8/18/09 | — | 3.2 | — | — | 3.4 | 560 | 950 | — | 13 | 7.8 | 16 | 15 | 6 | — | — | 1100 | — | — | 180 | — | 34 | 29 | 40 | 1200 |
| MD21-09-11475 | 339.5–344.5 | 8/18/09 | — | — | — | — | — | 560 | 1100 | — | 19 | — | 25 | 17 | — | — | — | 1800 | — | — | 85 | — | 29 | 12 | 33 | 1200 |
| **September 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-12598 | 67.5–72.5 | 9/15/09 | — | — | — | — | — | 48 | 390 | — | — | 4.4 | — | — | — | — | — | 4 | — | — | 570 | — | — | 15 | — | 240 |
| MD21-09-12600 | 217–222 | 9/15/09 | — | — | — | — | — | 400 | 800 | — | — | 7.4 | 6.1 | 9.4 | — | — | — | 460 | — | — | 280 | — | 26 | 33 | 16 | 880 |
| MD21-09-12601 | 242.5–247.5 | 9/15/09 | 15 | 2.8 | — | 3.9 | — | 530 | 960 | — | 9.7 | 7.1 | 16 | 14 | 5.4 | — | — | 1100 | — | — | 160 | — | 31 | 29 | 39 | 1100 |
| MD21-09-12602 | 339.5–344.5 | 9/15/09 | — | — | — | — | 7.9 | 670 | 1300 | — | 20 | — | 29 | 19 | — | — | — | 2200 | — | — | 94 | — | 35 | 16 | 38 | 1300 |
| **October 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-18 | 67.5–72.5 | 10/14/09 | 93 | — | — | 14 | — | 68 | 600 | — | — | 6.1 | — | — | — | — | — | 6.5 | — | — | 980 | — | 11 | 20 | — | 400 |
| MD21-10-20 | 217–222 | 10/14/09 | 20 | — | — | — | — | 400 | 900 | — | — | 8.1 | 7.3 | 17 | — | — | — | 610 | — | 13 | 330 | — | 39 | 34 | 20 | 1100 |
| MD21-10-21 | 242.5–247.5 | 10/14/09 | 43 | — | — | 6 | — | 480 | 1000 | — | 11 | 7.6 | 17 | 21 | 6 (J+) | — | — | 1400 | — | 23 | 180 | — | 43 | 26 | 45 | 1300 |
| MD21-10-22 | 339.5–344.5 | 10/14/09 | 32 | — | — | — | — | 460 | 1000 | — | — | — | 25 | 20 | — | — | — | 2200 | — | — | 79 | — | 37 | — | 32 | 1100 |
| **November 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-4997 | 67.5–72.5 | 11/20/09 | — | — | — | — | — | 56 | 440 | — | — | 5.1 | — | — | — | — | — | 5.4 | — | — | 640 | — | — | 16 | — | 260 |
| MD21-10-4998 | 217–222 | 11/20/09 | 13 | — | — | — | — | 200 | 500 | — | — | 4.8 | 4.1 | 5.4 | — | — | — | 310 | — | — | 160 | — | 12 | 18 | 10 | 520 |
| MD21-10-4999 | 242.5–247.5 | 11/20/09 | — | — | — | — | 4.3 | 160 | 400 | — | — | — | 6.5 | 5.4 | — | — | — | 550 | — | — | 56 | — | 8.5 | 8.8 | 17 | 400 |
| MD21-10-5000 | 339.5–344.5 | 11/20/09 | — | — | — | — | — | 340 | 750 | — | — | — | 14 | 11 | — | 58 (J) | — | 1400 | — | — | 44 | — | 17 | — | 18 | 690 |
| **December 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-8504 | 67.5–72.5 | 12/21/09 | 9.5 | — | — | — | — | — | — | — | — | — | — | — | — | — | 9 | — | 4.3 | — | — | — | — | — | — | — |
| MD21-10-8507 | 242.5–247.5 | 12/21/09 | — | — | — | — | — | 400 | 780 | — | 8.6 | 7 | 13 | 11 | 3.5 (J) | — | — | 960 | — | — | 130 | — | 22 | 22 | 34 | 920 |
| MD21-10-8508 | 339.5–344.5 | 12/21/09 | — | — | — | — | — | 6.5 | — | — | — | — | — | — | — | — | — | 4.7 | — | — | — | — | — | — | — | — |

**Table 5.1-3 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Dichlorobenzene[1,2-] | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Hexane | Methylene Chloride | n-Heptane | Propylene | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **January 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-11399 | 67.5–72.5 | 1/27/10 | — | — | — | — | — | 59 | 490 | — | — | 5.6 | — | — | — | — | — | 5.6 | — | — | 900 | — | — | 17 | — | 330 |
| MD21-10-11401 | 217–222 | 1/27/10 | — | — | — | — | — | 380 | 800 | — | 5 (J) | 8.4 | 7.3 | 10 | — | — | — | 580 | — | — | 310 | — | 25 | 33 | 18 | 940 |
| MD21-10-11402 | 242.5–247.5 | 1/27/10 | — | — | — | — | — | 540 | 1000 | — | 12 | 8.8 | 20 | 16 | — | — | — | 1400 | — | — | 200 | — | 33 | 30 | 48 | 1300 |
| MD21-10-11403 | 339.5–344.5 | 1/27/10 | — | — | — | — | — | 420 | 970 | — | 15 | — | 26 | 14 | — | — | — | 2000 | — | — | 73 | 9.5 | 23 | 10 | 32 | 970 |
| **February 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-12264 | 67.5–72.5 | 2/17/10 | — | — | — | — | — | 80 | 620 | — | — | 7 | — | — | — | — | — | 5 | — | — | 860 | — | 7.2 | 22 | — | 380 |
| MD21-10-12266 | 217–222 | 2/17/10 | — | — | 6.1 | — | — | 510 | 1000 | — | — | 9.8 | 7.7 | 12 | 3.7 | — | — | 560 | — | — | 330 | — | 30 | 43 | 18 | 1100 |
| MD21-10-12267 | 242.5–247.5 | 2/17/10 | — | — | — | — | — | 700 | 1200 | — | 13 | 10 | 20 | 18 | — | — | — | 1400 | — | — | 200 | — | 38 | 36 | 48 | 1400 |
| MD21-10-12268 | 339.5–344.5 | 2/17/10 | — | — | — | — | — | 640 | 1400 | — | 22 | — | 31 | 20 | — | — | — | 2300 | — | — | 86 | — | 33 | 15 | 39 | 1300 |
| **March 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-13978 | 67.5–72.5 | 3/22/10 | — | — | — | — | — | 70 | 510 | — | — | 6.6 | — | — | — | — | — | 5.1 | — | — | 780 | — | 7.2 | 19 | — | 350 |
| MD21-10-13979 | 217–222 | 3/22/10 | — | — | 6 | — | — | 440 | 810 | — | 6.9 | 8.6 | 6.9 | 11 | — | — | — | 510 | — | — | 270 | — | 28 | 37 | 15 | 900 |
| MD21-10-13980 | 242.5–247.5 | 3/22/10 | — | — | — | — | — | 590 | 990 | — | 15 | 8.8 | 18 | 15 | 4.7 | — | — | 1100 | — | — | 170 | — | 32 | 31 | 39 | 1200 |
| MD21-10-14014 | 339.5–344.5 | 3/22/10 | — | — | — | — | — | 610 | 1200 | — | 25 | — | 29 | 19 | — | — | — | 1800 | — | — | 73 | — | 30 | 14 | 36 | 1200 |
| **April 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-15939 | 67.5–72.5 | 4/26/10 | — | — | — | — | 4.9 | 67 | 530 | — | — | 5.4 | — | — | — | — | — | 4.7 | — | — | 880 | — | — | 18 | — | 350 |
| MD21-10-15941 | 217–222 | 4/26/10 | — | — | — | — | — | 390 | 790 | — | — | 6.8 | 6.2 | 8.9 | — | — | — | 460 | — | — | 290 | — | 24 | 34 | 16 | 900 |
| MD21-10-15942 | 242.5–247.5 | 4/26/10 | 14 | — | — | — | — | 470 | 860 | — | 8.7 | 6.2 | 14 | 11 | 4.1 | — | — | 940 | — | — | 160 | — | 25 | 25 | 37 | 1000 |
| MD21-10-15943 | 339.5–344.5 | 4/26/10 | — | — | — | — | — | 480 | 1000 | — | 12 | — | 22 | 14 | — | — | — | 1500 | — | — | 93 | — | 23 | 12 | 28 | 1000 |
| **June 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-19322 | 67.5–72.5 | 6/15/10 | — | — | — | — | — | 63 | 560 | — | — | — | — | — | — | — | — | — | — | — | 820 | — | — | — | — | 280 |
| MD21-10-19324 | 217–222 | 6/15/10 | — | — | — | — | — | 280 | 710 | — | — | — | — | — | — | — | — | 470 | — | — | 220 | — | — | — | — | 610 |
| MD21-10-19325 | 242.5–247.5 | 6/15/10 | — | — | — | — | — | 310 | 710 | — | — | — | — | — | — | — | — | 930 | — | — | 110 | — | — | — | — | 670 |
| MD21-10-19326 | 339.5–344.5 | 6/15/10 | — | — | — | — | — | 320 | 790 | — | — | — | — | — | — | — | — | 1200 | — | — | — | — | — | — | — | 600 |

Notes: Results are in µg/m$^3$. See Appendix A for data qualifier definitions.
* — = Not detected.

**Table 5.1-4**
**Summary of VOCs Detected in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-603059, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Ethyltoluene[4-] | Hexane | Methanol | Methyl-2-pentanone[4-] | Methylene Chloride | Propanol[2-] | Propylene | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene | Trimethylbenzene[1,2,4-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **July 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11272 | 77.5–82.5 | 7/15/09 | 44 | —[a] | 6.2 | 12 | 5.4 | — | 64 | 1100 | — | — | 5.9 | — | — | — | — | — | — | — | — | 4 | — | — | 1600 | 200 | — | 18 | — | 720 | — | — |
| MD21-09-11273 | 187.5–192.5 | 7/15/09 | 43 | — | 6.2 | — | 5.4 | — | 120 | 530 | — | — | 7 | — | 5.5 | — | — | — | 5.5 | — | — | 24 | — | — | 310 | 21 | 14 | 22 | — | 400 | — | — |
| MD21-09-11274 | 229.5–234.5 | 7/15/09 | 13 | — | — | — | — | — | 210 | 480 | — | — | 6.8 | — | 8.4 | — | — | — | — | — | — | 37 | — | — | 190 | — | 18 | 18 | — | 440 | — | — |
| MD21-09-11275 | 292.5–297.5 | 7/15/09 | 15 | — | 11 | — | — | 4.2 | 690 | 690 | — | — | 11 | 5.3 | 26 | 7 | — | — | — | — | — | 320 | — | — | 200 | 6.1 | 51 | 28 | 23 | 1200 | — | — |
| MD21-09-11276 | 372.5–377.5 | 7/15/09 | 12 | — | 10 | — | — | 4.6 | 380 | 600 | — | 6 | — | 13 | 35 | — | — | — | — | — | — | 760 | — | — | 72 | 9.5 | 14 | 8.2 | 85 | 850 | — | 4.6 |
| **August 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-11469 | 77.5–82.5 | 8/14/09 | 22 | — | — | — | 4.6 | 18 | 61 | 1000 | — | — | 5.1 | — | — | — | — | — | — | — | — | — | — | — | 1800 | — | — | 17 | — | 700 | — | — |
| MD21-09-11470 | 187.5–192.5 | 8/14/09 | 8.7 | — | 6.8 | — | 3.1 | 38 | 140 | 580 | — | — | 7 | — | 5.6 | — | — | — | — | — | — | 24 | — | — | 380 | — | 17 | 24 | — | 470 | — | — |
| MD21-09-11471 | 229.5–234.5 | 8/14/09 | 28 | — | — | — | 5 | — | 170 | 320 | 4.1 | 30 | 5.2 | — | 6.4 | — | — | — | — | — | — | 42 | 8.3 (J) | — | 140 | 40 | 18 | 13 | — | 320 | — | — |
| MD21-09-11468 | 292.5–297.5 | 8/14/09 | 51 | — | 9.1 | — | 9 | — | 640 | 630 | — | — | 9.3 | 4.6 | 22 | — | — | — | — | — | — | 280 | — | — | 190 | 3.7 | 52 | 25 | 21 | 1100 | — | — |
| MD21-09-11467 | 372.5–377.5 | 8/14/09 | 40 | 3.1 | 11 | — | 7.2 | — | 530 | 700 | — | 7 | — | 13 | 48 | 4.4 | — | — | — | — | — | 800 | — | — | 100 | 6.5 | 27 | 11 | 100 | 1200 | — | — |
| **September 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-09-12623 | 77.5–82.5 | 9/18/09 | 12 | — | — | — | — | — | 59 | 1000 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1800 | — | — | 18 | — | 700 | — | — |
| MD21-09-12624 | 187.5–192.5 | 9/18/09 | 11 | — | 6 | — | — | 26 | 140 | 580 | — | — | 6.4 | — | 5.6 | — | — | — | — | — | — | 24 | — | — | 360 | — | 16 | 24 | — | 460 | — | — |
| MD21-09-12625 | 229.5–234.5 | 9/18/09 | — | — | 6.9 | — | — | — | 340 | 660 | — | — | 8.3 | — | 13 | — | — | — | — | — | — | 47 | — | — | 280 | — | 35 | 28 | — | 660 | — | — |
| MD21-09-12626 | 292.5–297.5 | 9/18/09 | 10 | — | 9.2 | — | — | — | 670 | 670 | — | — | 11 | 5.2 | 31 | — | — | — | — | — | — | 300 | — | — | 190 | 3.6 | 67 | 26 | 20 | 1200 | — | — |
| MD21-09-12627 | 372.5–377.5 | 9/18/09 | 19 | 2.8 | 11 | — | — | — | 520 | 700 | — | 5.8 | — | 14 | 54 | 4.5 | — | — | — | 140 (J) | — | 720 | — | — | 94 | 5.9 | 27 | 11 | 95 | 1100 | — | — |
| **October 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-10 | 77.5–82.5 | 10/20/09 | — | — | — | — | 3.5 | — | 58 | 1000 | — | — | 5.2 | — | — | — | — | — | — | NA[b] | — | — | — | — | 1500 | — | — | 17 | — | 630 | — | — |
| MD21-10-11 | 187.5–192.5 | 10/20/09 | — | — | 6.4 | — | 4.5 | — | 130 | 580 | — | — | 6.2 | — | 4.6 (J) | — | — | — | — | NA | — | — | — | 8.4 | 340 | — | 12 (J) | 24 | — | 430 | — | — |
| MD21-10-12 | 229.5–234.5 | 10/20/09 | — | — | 7.1 | — | — | — | 390 | 700 | — | — | 8.8 | — | 12 (J) | — | — | — | — | NA | — | 54 (J-) | — | 14 | 260 | — | 28 (J) | 28 | — | 660 | — | — |
| MD21-10-13 | 292.5–297.5 | 10/20/09 | — | — | 8.8 | — | — | — | 580 | 630 | — | — | 9 | 4.2 | 17 (J) | 3.8 | — | — | — | NA | — | 140 (J-) | — | 18 | 180 | — | 35 (J) | 24 | 22 | 960 | — | — |
| MD21-10-14 | 372.5–377.5 | 10/20/09 | — | 2.8 (J) | 11 | — | 2.6 | — | 480 | 670 | — | 8.2 | — | 12 | 33 (J) | 3.9 | — | — | — | NA | — | 730 (J-) | — | 12 | 99 | 5.6 | 17 (J) | 10 | 100 | 1000 | — | — |
| **November 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-4991 | 77.5–82.5 | 11/18/09 | 20 | — | — | — | 3.3 | — | 52 | 1000 | — | — | 5.4 | — | — | — | — | — | — | NA | — | 3.3 (J-) | — | — | 1700 | — | — | 15 | — | 600 | — | — |
| MD21-10-4993 | 187.5–192.5 | 11/18/09 | — | — | 6.1 | — | — | — | 120 | 560 | — | — | 6.4 | — | 5.4 (J-) | — | — | — | — | NA | — | 24 (J-) | — | 7.4 | 320 | — | 14 | 21 | — | 410 | — | — |
| MD21-10-4994 | 229.5–234.5 | 11/18/09 | 13 | — | 6.9 | — | 3.3 | — | 290 | 640 | — | — | 8.4 | — | 13 (J-) | — | — | — | — | NA | — | 40 (J-) | — | 13 | 240 | — | 30 | 24 | — | 570 | — | — |
| MD21-10-4995 | 292.5–297.5 | 11/18/09 | — | — | 7.8 | — | — | — | 560 | 610 | — | — | 9.4 | 4 | 23 (J-) | — | — | — | — | NA | — | 270 (J-) | — | 18 | 170 | 4.1 | 47 | 22 | 20 | 980 | — | — |
| MD21-10-4996 | 372.5–377.5 | 11/18/09 | — | 2.7 | 10 | — | — | — | 500 | 700 | — | 7 | 4.4 | 12 | 51 (J-) | 4.2 | — | — | — | NA | — | 880 (J-) | — | 13 | 91 | 5.3 | 24 | 10 | 96 | 1100 | — | — |
| **December 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-8498 | 77.5–82.5 | 12/16/09 | — | — | — | — | — | — | 53 | 940 | — | — | 4.7 | — | — | — | — | — | — | NA | — | 3.1 | — | — | 1700 | — | — | 16 | — | 600 | — | — |
| MD21-10-8499 | 187.5–192.5 | 12/16/09 | — | — | 6.3 | — | — | — | 120 | 550 | — | — | 5.9 | — | 5.5 | — | — | — | — | NA | — | 24 | — | — | 370 | — | 15 | 22 | — | 420 | — | — |
| MD21-10-8500 | 229.5–234.5 | 12/16/09 | — | — | — | — | — | — | 200 | 520 | — | — | 6.4 | — | 8.9 | — | — | — | — | NA | — | 33 | — | — | 240 | 3.4 | 20 | 20 | — | 440 | 6.3 | 4.4 |

**Table 5.1-4 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Ethanol | Ethyltoluene[4-] | Hexane | Methanol | Methyl-2-pentanone[4-] | Methylene Chloride | Propanol[2-] | Propylene | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene | Trimethylbenzene[1,2,4-] | Xylene[1,3-]+Xylene[1,4-] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MD21-10-8501 | 292.5–297.5 | 12/16/09 | — | — | 8.3 | — | — | — | 550 | 610 | — | — | 8.8 | 4.4 | 23 | 3.5 | — | — | — | NA | — | 280 | — | — | 180 | 3.3 | 44 | 23 | 20 | 970 | — | — |
| MD21-10-8502 | 372.5–377.5 | 12/16/09 | 13 | — | 7.2 | — | — | — | 330 | 490 | — | 5.4 | — | 9.2 | 34 | — | — | — | — | NA | — | 600 | — | — | 78 | 4.2 | 15 | 7.7 | 70 | 780 | — | — |
| **January 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-11391 | 77.5–82.5 | 1/20/10 | — | — | — | — | — | — | 29 | 400 | — | — | — | — | — | — | 120 | — | — | NA | — | 4.3 | — | — | 910 | — | — | 8.4 | — | 280 | — | — |
| MD21-10-11393 | 187.5–192.5 | 1/20/10 | — | — | 6.5 | — | — | — | 130 | 560 | — | — | 6.2 | — | 6.5 | — | 24 | — | — | NA | — | 25 | — | — | 340 | — | 16 | 22 | — | 430 | — | — |
| MD21-10-11394 | 229.5–234.5 | 1/20/10 | — | — | 6.7 | — | — | — | 380 | 660 | — | — | 8.7 | — | 18 | — | 7 | — | — | NA | — | 57 | — | — | 250 | — | 40 | 25 | — | 760 | — | — |
| MD21-10-11395 | 292.5–297.5 | 1/20/10 | — | — | 8.4 | — | — | — | 560 | 630 | — | — | 8.9 | 4.1 | 26 | 3.5 | 26 | — | — | NA | — | 280 | — | — | 180 | — | 50 | 23 | 20 | 1100 | — | — |
| MD21-10-11396 | 372.5–377.5 | 1/20/10 | — | 3 | 11 | — | — | — | 510 | 730 | — | 7 | — | 13 | 56 | 4.1 | 70 | — | — | NA | — | 880 | — | — | 110 | 5.5 | 25 | 11 | 100 | 1200 | — | — |
| **February 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-12256 | 77.5–82.5 | 2/10/10 | — | — | 6.2 | — | — | — | 69 | 1300 | — | — | 6.7 | — | — | — | — | — | — | NA | — | — | — | — | 2000 | — | 7.1 | 20 | — | 810 | — | — |
| MD21-10-12258 | 187.5–192.5 | 2/10/10 | — | — | 8 | — | — | — | 160 | 700 | — | — | 8.6 | — | 7 | — | — | — | — | NA | — | — | — | — | 430 | — | 20 | 27 | — | 560 | — | — |
| MD21-10-12259 | 229.5–234.5 | 2/10/10 | — | — | 8.6 | — | — | — | 460 | 810 | 3.1 | — | 11 | — | 17 | — | — | — | — | NA | — | 64 | — | — | 300 | — | 43 | 31 | — | 840 | — | — |
| MD21-10-12260 | 292.5–297.5 | 2/10/10 | — | — | 11 | — | — | — | 760 | 800 | 3 | — | 12 | 5.6 | 30 | 4.5 | — | — | — | NA | — | 360 | — | — | 210 | 4 | 61 | 30 | 25 | 1400 | — | — |
| MD21-10-12261 | 372.5–377.5 | 2/10/10 | — | 4 | 14 | — | — | — | 670 | 890 | — | 7.6 | 5.5 | 16 | 63 | 4.9 | — | — | — | NA | — | 1100 | — | — | 120 | 8.4 | 29 | 14 | 120 | 1500 | — | — |
| **March 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-13971 | 77.5–82.5 | 3/16/10 | — | — | 5.9 (J) | — | — | — | 63 | 1100 | — | — | 6.2 | — | — | — | — | — | — | NA | — | — | — | — | 1800 | — | 7.3 | 17 | — | 700 | — | — |
| MD21-10-13972 | 187.5–192.5 | 3/16/10 | — | — | 6.7 | — | — | — | 140 | 570 | — | — | 7.4 | — | 6 | — | — | — | — | NA | — | 23 | — | — | 370 | — | 16 | 24 | — | 450 | — | — |
| MD21-10-13973 | 229.5–234.5 | 3/16/10 | — | — | 8.1 | — | — | — | 360 | 680 | 3 | — | 9.6 | — | 15 | — | — | — | — | NA | — | 48 | — | — | 280 | — | 35 | 28 | — | 680 | — | — |
| MD21-10-13974 | 292.5–297.5 | 3/16/10 | — | — | 11 | — | — | 8.3 | 680 | 670 | — | — | 11 | 4.8 | 28 | 3.8 | — | — | — | NA | — | 280 | — | — | 180 | 3.8 | 55 | 27 | 21 | 1100 | — | — |
| MD21-10-13975 | 372.5–377.5 | 3/16/10 | 11 | 3.2 | 12 | — | 2.5 (J) | 5.2 | 590 | 750 | — | 17 | 5 | 14 | 58 | 4.5 | — | 4.6 | — | NA | 7.5 | 840 | — | — | 100 | 10 | 28 | 13 | 100 | 1200 | 11 | 7.5 |
| **April 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-15933 | 77.5–82.5 | 4/21/10 | 9.4 | — | 5.8 (J) | — | — | — | 59 | 1200 | — | — | 5.8 | — | — | — | 7.1 | — | — | NA | — | 3.7 | — | — | 1800 | — | — | 18 | — | 690 | — | — |
| MD21-10-15935 | 187.5–192.5 | 4/21/10 | — | — | 7.2 | — | — | — | 150 | 700 | — | — | 7.7 | — | 5.3 | — | — | — | — | NA | — | 28 | — | — | 390 | — | 16 | 25 | — | 480 | — | — |
| MD21-10-15936 | 229.5–234.5 | 4/21/10 | — | — | 7.8 | — | — | — | 390 | 770 | — | — | 9.6 | — | 13 | — | — | — | — | NA | — | 55 | — | — | 270 | — | 34 | 27 | — | 730 | — | — |
| MD21-10-15937 | 292.5–297.5 | 4/21/10 | — | — | 10 | — | — | — | 690 | 800 | — | — | 11 | 4.7 | 22 | 3.6 | — | — | — | NA | — | 320 | — | — | 200 | 3.4 | 48 | 28 | 22 | 1200 | — | — |
| MD21-10-15938 | 372.5–377.5 | 4/21/10 | 12 | 2.8 | 13 | — | — | — | 530 | 780 | — | 6.1 | — | 14 | 41 | 3.5 | — | — | — | NA | — | 870 | — | — | 100 | 6 | 21 | 11 | 110 | 1200 | — | — |
| **June 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-19314 | 77.5–82.5 | 6/9/10 | — | — | — | — | — | — | 71 (J+) | 1300 | — | — | — | — | — | — | — | — | — | NA | — | — | — | — | 1700 | — | — | 20 (J+) | — | 740 | — | — |
| MD21-10-19316 | 187.5–192.5 | 6/9/10 | — | — | — | — | — | — | 170 (J+) | 670 | — | — | 9.5 (J+) | — | — | — | — | — | — | NA | — | 25 | — | — | 340 | — | 17 | 28 (J+) | — | 480 | — | — |
| MD21-10-19317 | 229.5–234.5 | 6/9/10 | 23 | — | — | — | — | — | 330 (J+) | 650 | — | — | 10 (J+) | — | 9.8 | — | — | — | — | NA | — | 40 | — | — | 200 | — | 26 | 25 (J+) | — | 580 | — | — |
| MD21-10-19318 | 292.5–297.5 | 6/9/10 | — | — | — | — | — | — | 680 (J+) | 660 | — | — | 12 (J+) | — | 20 | — | — | — | — | NA | — | 260 | — | — | 140 | — | 42 | 26 (J+) | 15 | 1000 | — | — |
| MD21-10-19319 | 372.5–377.5 | 6/9/10 | — | — | — | — | — | — | 530 (J+) | 710 | — | — | — | 15 | 39 | — | — | — | — | NA | — | 790 | — | — | 70 | — | 19 | 11 (J+) | 74 | 1000 | — | — |

Notes: Results are in µg/m$^3$. See Appendix A for data qualifier definitions.

[a] — = Not detected.

[b] NA = Not analyzed.

**Table 5.1-5**
**Summary of VOCs Detected in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-607955, November 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Hexane | Methylene Chloride | n-Heptane | Propylene | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **November/December 2009** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-7567 | 71.1–76.4 | 12/2/09 | —* | — | — | — | — | 9.4 | 89 | 680 | — | — | — | — | — | — | — | 66 | — | — | 2000 | 29 | — | 16 | — | 430 |
| MD21-10-7568 | 153.8–159.7 | 12/3/09 | — | — | — | — | — | 4.6 | 190 | 560 | — | — | 8 | 4.4 | — | — | — | 290 | — | — | 390 | 22 | 9.8 | 18 | 6.3 | 490 |
| MD21-10-7569 | 173.4–179 | 12/2/09 | 31 | — | — | — | — | — | — | 19 | — | — | — | — | — | — | — | 25 | — | — | — | — | — | — | — | 20 |
| MD21-10-7570 | 225.9–232.1 | 12/2/09 | 100 | 3 | 5.5 | — | 2.6 | 20 | 340 | 680 | 3.6 | — | 7.4 | 11 | 8 | — | 2.9 | 880 | — | — | 220 | 90 | 16 | 17 | 16 | 710 |
| MD21-10-7571 | 326.6–333.4 | 12/3/09 | 18 | — | — | — | — | 4.5 | 130 | 350 | — | — | 4.6 | 7.5 | 4 | — | — | 660 | — | — | 110 | 9.4 | — | 9.4 | 6.6 | 290 |
| MD21-10-7572 | 353.3–359.6 | 12/2/09 | 16 | — | — | — | — | 5.6 | 360 | 1000 | — | — | — | 21 | 15 | — | — | 2100 | — | — | 29 | 83 | 13 | — | 15 | 760 |
| MD21-10-7573 | 459.4–464.8 | 12/2/09 | — | — | — | — | — | — | 26 | 91 | — | — | — | — | — | — | — | 180 | — | — | — | 12 | — | — | — | 57 |
| MD21-10-7574 | 559–565 | 12/2/09 | 8.9 | 3.4 | — | — | — | 4.5 | 100 | 540 | — | — | — | — | 24 | — | 5.2 | 710 | — | — | — | 100 | — | — | — | 320 |
| MD21-10-7575 | 651.3–657.3 | 12/2/09 | — | — | — | — | — | 6.1 | — | 29 | — | — | — | — | 3.8 | — | 3.9 | 17 | — | — | — | 100 | — | — | — | 18 |
| MD21-10-7576 | 797.2–803.1 | 12/3/09 | 17 | — | — | — | — | 3.3 | — | — | — | — | — | — | — | — | — | — | — | 8.6 | — | 11 | — | — | — | — |
| MD21-10-7577 | 946.2–952.1 | 12/3/09 | 30000 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 690 | — | — | — | — |
| MD21-10-8099 | 71.1–76.4 | 12/18/09 | — | — | — | — | — | — | 65 | 520 | — | — | — | — | — | — | — | 33 | — | — | 1800 | 22 | — | — | — | 350 |
| MD21-10-8100 | 153.8–159.7 | 12/18/09 | 9.1 | — | — | — | — | 6.1 | 170 | 610 | — | — | 9.2 | 3.9 | — | — | — | 220 | — | — | 430 | 18 | 9.6 | 19 | 5.3 | 500 |
| MD21-10-8101 | 173.4–179 | 12/18/09 | 16 | — | — | — | — | 7.2 | 220 | 680 | — | — | 9.2 | 5.2 | 4.1 | — | — | 370 | — | — | 420 | 42 | 11 | 22 | 9.2 | 580 |
| MD21-10-8102 | 225.9–232.1 | 12/17/09 | 14 | 2.9 | — | — | — | 12 | 340 | 730 | — | — | 7.9 | 12 | 8.1 | — | — | 870 | — | — | 230 | 74 | 15 | 19 | 17 | 760 |
| MD21-10-8103 | 326.6–333.4 | 12/17/09 | 8.4 | — | — | — | — | 7.6 | 180 | 450 | — | — | 4.7 | 9.7 | 5 | — | — | 850 | — | — | 100 | 13 | 8.3 | 5.4 | 8.7 | 390 |
| MD21-10-8104 | 353.3–359.6 | 12/17/09 | — | — | — | — | — | — | 100 | 260 | — | — | — | 5 | 4.9 | — | — | 530 | — | — | 8.9 | 18 | — | — | — | 210 |
| MD21-10-8105 | 459.4–464.8 | 12/17/09 | — | — | — | — | — | — | 160 | 560 | — | — | — | 9.5 | 8.7 | — | — | 950 | — | — | 10 | 22 | — | — | — | 390 |
| MD21-10-8106 | 565–599 | 12/17/09 | 11 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| MD21-10-8107 | 651.3–657.3 | 12/18/09 | — | — | — | — | — | 3.4 | — | 48 | — | — | — | — | 6.5 | — | — | 24 | — | 8.3 | — | 39 | — | — | — | 29 |
| MD21-10-8108 | 797.2–803.1 | 12/17/09 | 14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| MD21-10-8109 | 946.2–952.1 | 12/17/09 | 1400 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| **January 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-11424 | 71.1–76.4 | 1/25/10 | — | — | — | — | — | 8.2 | 70 | 710 | — | — | — | — | — | — | — | 27 | — | — | 3200 | 6.7 | — | 15 | — | 520 |
| MD21-10-11425 | 153.8–159.7 | 1/25/10 | — | — | — | — | — | 5 | 130 | 540 | — | — | 7.4 | 3.1 | — | — | — | 150 | — | — | 540 | 6.3 | 8.3 | 17 | 5.6 | 490 |
| MD21-10-11426 | 173.4–179 | 1/25/10 | — | — | — | — | — | 5.8 | 150 | 520 | — | — | 6.4 | 4.5 | — | — | — | 260 | — | — | 450 | 16 | 8.3 | 16 | 8.4 | 500 |
| MD21-10-11427 | 225.9–232.1 | 1/25/10 | — | — | — | — | — | 16 | 400 | 880 | — | — | 9.2 | 18 | 9.8 | — | — | 1300 | — | — | 290 | 33 | 21 | 22 | 28 | 1000 |
| MD21-10-11428 | 326.6–333.4 | 1/25/10 | — | — | — | — | — | — | 360 | 820 | — | — | — | 20 | 11 | — | — | 1800 | — | — | 140 | 14 | 17 | — | 17 | 840 |
| MD21-10-11429 | 353.3–359.6 | 1/25/10 | — | — | — | — | — | — | 410 | 1300 | — | — | — | 34 | 20 | — | — | 2700 | — | — | 47 | 42 | — | — | 26 | 1100 |
| MD21-10-11430 | 459.4–464.8 | 1/25/10 | — | — | — | — | — | 6.7 | 320 | 1300 | — | — | — | 25 | 23 | — | — | 2200 | — | — | 23 | 39 | — | — | 11 | 910 |

**Table 5.1-5 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Hexane | Methylene Chloride | n-Heptane | Propylene | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MD21-10-11431 | 559–565 | 1/25/10 | — | 2.6 | — | — | — | 3.1 | 110 | 600 | — | — | — | — | 23 | — | — | 800 | — | — | 6.2 | 40 | — | — | — | 430 |
| MD21-10-11432 | 651.3–657.3 | 1/26/10 | — | — | — | — | — | — | 10 | 83 | — | — | — | — | 13 | — | — | 48 | — | — | — | 17 | — | 14 | — | 57 |
| MD21-10-11434 | 946.2–952.1 | 1/26/10 | 2500 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 330 | — | — | — | — |
| **February 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-12289 | 71.1–76.4 | 2/12/10 | — | — | — | — | — | 6.9 | 80 | 730 | — | — | — | — | — | — | — | 17 | — | — | 2600 | — | — | 16 | — | 500 |
| MD21-10-12290 | 153.8–159.7 | 2/12/10 | — | — | — | — | — | 4.5 | 190 | 680 | 2.9 | — | 9.5 | 3.6 | — | — | — | 140 | — | — | 590 | 7.8 | 10 | 24 | 6.4 | 570 |
| MD21-10-12291 | 173.4–175 | 2/12/10 | — | — | — | — | — | 5.9 | 240 | 730 | 2.9 | — | 9.4 | 5.5 | 4.9 | — | — | 280 | — | — | 520 | 19 | 12 | 26 | 9.8 | 650 |
| MD21-10-12292 | 225.9–232.1 | 2/12/10 | — | 3 | 7.4 | — | — | 8 | 480 | 900 | 3.4 | 6.5 | 10 | 16 | 9.4 | 3.5 | — | 960 | — | — | 260 | 35 | 20 | 26 | 22 | 950 |
| MD21-10-12293 | 326.6–333.9 | 2/12/10 | — | — | — | — | — | — | 450 | 880 | — | — | — | 21 | 10 | — | — | 1500 | — | — | 120 | 19 | 17 | 11 | 16 | 870 |
| MD21-10-12294 | 353.3–359.6 | 2/12/10 | — | — | — | — | — | — | 470 | 1300 | — | — | — | 32 | 20 | — | — | 2200 | — | — | 41 | 41 | — | — | 20 | 1100 |
| MD21-10-12295 | 459.4–464.8 | 2/12/10 | — | — | — | — | — | — | 370 | 1300 | — | — | — | 22 | 24 | — | — | 1800 | — | — | 20 | 33 | — | — | 9.5 | 900 |
| MD21-10-12296 | 559–565 | 2/12/10 | — | 2.8 | — | — | — | 3.1 | 180 | 850 | — | — | — | — | 31 | — | — | 820 | — | — | 7.8 | 60 | — | — | — | 560 |
| MD21-10-12297 | 651.3–657.3 | 2/12/10 | — | — | — | — | — | — | 24 | 150 | — | — | — | — | 21 | — | — | 64 | — | — | — | 24 | — | — | — | 100 |
| MD21-10-12298 | 797.2–803.1 | 2/15/10 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 4.7 | — | — | — | — |
| MD21-10-12299 | 946.2–952.1 | 2/15/10 | 620 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.4 | — | 6.9 | — | — | 500 | — | — | — | — |
| **March 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-14000 | 71.1–76.4 | 3/18/10 | — | — | — | — | — | — | 85 | 740 | — | — | 7.6 | — | — | — | — | 13 | — | — | 2600 | — | — | 18 | — | 540 |
| MD21-10-14001 | 153.8–159.7 | 3/18/10 | — | — | — | — | — | — | 180 | 610 | — | — | — | — | — | — | — | 140 | — | — | 550 | 4.7 | 11 | 22 | 5.8 | 560 |
| MD21-10-14002 | 173.4–179 | 3/18/10 | — | — | — | — | — | 30 | 240 | 670 | — | — | 9.1 | 5.1 | 4.4 | — | — | 260 | — | — | 480 | 11 | 13 | 25 | — | 650 |
| MD21-10-14003 | 225.9–232.1 | 3/18/10 | 26 | — | — | — | — | — | 470 | 860 | — | 7.5 | 9.6 | 16 | 11 | — | — | 910 | — | — | 260 | 24 | 19 | 25 | 22 | 980 |
| MD21-10-14004 | 326.6–333.4 | 3/18/10 | — | — | — | 24 | — | — | 460 | 920 | — | 13 | 7.2 | 21 | 14 | — | — | 1600 | — | — | 100 | 13 | 18 | 11 | 17 | 1000 |
| MD21-10-14005 | 353.3–359.6 | 3/18/10 | — | — | — | — | — | — | 470 | 1200 | — | 17 | — | 32 | 22 | — | — | 2100 | — | — | 42 | 28 | 16 | — | 21 | 1100 |
| MD21-10-14006 | 459.4–464.8 | 3/18/10 | — | — | — | — | — | — | 380 | 1300 | — | — | — | 22 | 23 | — | — | 1700 | — | — | 22 | 20 | — | — | — | 990 |
| MD21-10-14007 | 559–565 | 3/18/10 | — | 3.1 | — | — | — | — | 180 | 840 | — | — | — | — | 35 | — | — | 840 | — | — | 8.1 | 43 | — | — | — | 590 |
| MD21-10-14008 | 651.3–657.3 | 3/18/10 | — | — | — | — | — | — | 33 | 200 | — | — | — | — | 31 | — | — | 81 | — | — | — | 20 | — | — | — | 160 |
| MD21-10-14009 | 797.2–803.1 | 3/19/10 | 20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.6 | — | — | — | — |
| MD21-10-14010 | 946.2–952.1 | 3/19/10 | 99 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | — | 6.8 | 6.1 | — | 430 | — | — | — | — |
| **April 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-15964 | 71.1–76.4 | 4/22/10 | — | — | — | — | — | — | 81 | 760 | — | — | — | — | — | — | — | 9.9 | — | — | 2900 | — | — | 18 | — | 540 |
| MD21-10-15965 | 153.8–159.7 | 4/22/10 | — | — | — | — | — | 3.3 | 210 | 690 | — | — | 7.6 | — | — | — | — | 160 | — | — | 640 | 4.7 | 11 | 24 | 6.8 | 640 |
| MD21-10-15966 | 173.4–179 | 4/22/10 | — | — | — | — | — | 3.5 | 250 | 720 | — | — | 7.8 | 5.2 | 4.3 | — | — | 270 | — | — | 510 | 8 | 13 | 26 | 10 | 680 |
| MD21-10-15967 | 225.9–232.1 | 4/22/10 | — | 3 | 5.3 | — | — | 14 | 430 | 780 | — | — | 7.2 | 14 | 9.2 | — | — | 880 | — | — | 200 | 17 | 18 | 21 | 22 | 880 |
| MD21-10-15968 | 326.6–333.4 | 4/22/10 | — | — | — | — | — | — | 400 | 820 | — | — | — | 17 | 10 | — | — | 1500 | — | — | 84 | 17 | 14 | 8.8 | 14 | 820 |

**Table 5.1-5 (continued)**

| Sample ID | Depth (ft) | Collection Date | Acetone | Benzene | Bromodichloromethane | Butanol[1-] | Butanone[2-] | Carbon Disulfide | Carbon Tetrachloride | Chloroform | Cyclohexane | Dichlorobenzene[1,4-] | Dichlorodifluoromethane | Dichloroethane[1,2-] | Dichloroethene[1,1-] | Dichloroethene[cis-1,2-] | Hexane | Methylene Chloride | n-Heptane | Propylene | Tetrachloroethene | Toluene | Trichloro-1,2,2-trifluoroethane[1,1,2-] | Trichloroethane[1,1,1-] | Trichloroethane[1,1,2-] | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MD21-10-15969 | 353.3–359.6 | 4/22/10 | — | — | — | — | — | — | 470 | 1300 | — | — | — | 29 | 18 | — | — | 2100 | — | — | 41 | 20 | 16 | — | 22 | 1100 |
| MD21-10-15970 | 459.4–464.8 | 4/22/10 | — | — | — | — | — | — | 350 | 1300 | — | — | — | 20 | 20 | — | — | 1800 | — | — | 20 | 13 | — | — | 9.9 | 920 |
| MD21-10-15971 | 559–565 | 4/22/10 | — | 2.8 | — | — | — | — | 170 | 870 | — | — | — | — | 31 | — | — | 800 | — | — | 7.8 | 26 | — | — | — | 600 |
| MD21-10-15972 | 651.3–657.3 | 4/22/10 | 8.8 | — | — | — | — | 3 | 35 | 220 | — | — | — | — | 31 | — | — | 86 | — | — | — | 14 | — | — | — | 160 |
| MD21-10-15973 | 797.2–803.1 | 4/23/10 | — | — | — | — | — | — | — | 8.7 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| MD21-10-15974 | 946.2–952.1 | 4/23/10 | 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.2 | — | — | 320 | — | — | — | — |
| **June 2010** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD21-10-19349 | 71.1–76.4 | 6/10/10 | — | — | — | — | — | — | 81 | 830 | — | — | — | — | — | — | — | — | — | — | 3100 | — | — | — | — | 460 |
| MD21-10-19350 | 153.8–159.7 | 6/10/10 | — | — | — | — | — | — | 180 | 720 | — | — | — | — | — | — | — | 160 | — | — | 660 | — | — | — | — | 530 |
| MD21-10-19351 | 173.4–179 | 6/10/10 | — | — | — | — | — | — | 230 | 770 | — | — | — | — | — | — | — | 310 | — | — | 530 | — | — | — | — | 580 |
| MD21-10-19352 | 225.9–232.1 | 6/10/10 | — | — | — | — | — | — | 480 | 1000 | — | — | — | — | — | — | — | 1200 | — | — | 280 | — | — | — | — | 930 |
| MD21-10-19353 | 326.6–333.4 | 6/10/10 | — | — | — | — | — | — | 490 | 1100 | — | — | — | — | — | — | — | 2100 | — | — | 100 | — | — | — | — | 900 |
| MD21-10-19354 | 353.3–359.6 | 6/10/10 | — | — | — | — | — | — | 470 | 1500 | — | — | — | — | — | — | — | 2500 | — | — | — | — | — | — | — | 980 |
| MD21-10-19355 | 459.4–464.8 | 6/10/10 | — | — | — | — | — | — | 350 | 1400 | — | — | — | — | — | — | — | 2000 | — | — | — | — | — | — | — | 770 |
| MD21-10-19356 | 559–565 | 6/10/10 | — | — | — | — | — | — | 160 | 860 | — | — | — | — | — | — | — | 880 | — | — | — | — | — | — | — | 470 |
| MD21-10-19357 | 651.3–657.3 | 6/10/10 | — | — | — | — | — | — | — | 290 | — | — | — | — | 42 | — | — | 130 | — | — | — | — | — | — | — | 180 |
| MD21-10-19358 | 797.2–803.1 | 6/11/10 | — | — | — | — | — | 26 | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.8 | — | — | — | — |
| MD21-10-19359 | 946.2–952.1 | 6/11/10 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 230 | — | — | — | — |

Note: Results are in µg/m$^3$.

* — = Not detected.

**Table 5.2-1**
**Screening of VOCs Detected in Pore Gas at MDA T, April–June 2010**

| VOC | Maximum Pore Gas Concentration (µg/m³) | Groundwater SL[a] (µg/L) | Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard[b] (µg/m³) | SV[b] (unitless) |
|---|---|---|---|---|
| Acetone | 23 | 21,800 | 34,880 | 6.59E-04 |
| Benzene | 3.7 | 5[d] | 1150 | 3.22E-03 |
| Bromodichloromethane | 15 | 80[d] | 6960 | 2.16E-03 |
| 2-Butanone | 5.7 | 7,060 | 16,238 | 3.51E-04 |
| Carbon Disulfide | 26 | 1,040 | 613,600 | 4.24E-05 |
| Carbon Tetrachloride | 950 | 5[d] | 5500 | 1.73E-01 |
| Chloroform | 2000 | 80[d] | 12,000 | 1.67E-01 |
| Cyclohexane | 3.8 | 13,000[e] | 79,300,000 | 4.79E-08 |
| 1,4-Dichlorobenzene | 12 | 75[d] | 7500 | 1.60E-03 |
| Dichlorodifluoromethane | 13 | 395 | 5,530,000 | 2.35E-06 |
| 1,2-Dichloroethane | 29 | 5[d] | 240 | 1.21E-01 |
| 1,1-Dichloroethene | 89 | 5[f] | 5500 | 1.62E-02 |
| cis-1,2-Dichloroethene | 4.5 | 70[d] | 11,900 | 3.78E-04 |
| Methylene chloride | 2500 | 5[d] | 650 | **3.85E+00** |
| Tetrachloroethene | 3700 | 5[d] | 3600 | **1.03E+00** |
| Toluene | 320 | 750[f] | 202,500 | 1.58E-03 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 55 | 59,200 | 1,302,400,000 | 4.22E-08 |
| 1,1,1-Trichloroethane | 34 | 60[f] | 42,600 | 7.98E-04 |
| 1,1,2-Trichloroethane | 200 | 5[d] | 170 | **1.18E+00** |
| Trichloroethene | 1600 | 5[d] | 2000 | 8.00E-01 |
| 1,2,4-Trimethylbenzene | 16 | 15[e] | 3750 | 4.27E-03 |

[a] SLs from NMED (2009, 106420) unless otherwise noted.

[b] Derived from denominator of Equation 3.0-3..

[c] Calculated using equation 3.0-3. If the SV is less than 1, the concentration of the VOC in pore gas does not have the potential to exceed the groundwater SL. Screening values greater than 1 are in bold.

[d] SL is EPA MCL (40 Code of Federal Regulations 141.61).

[e] SL from EPA regional screening tables (http://www.epa.gov/region09/superfund/prg).

[f] NMWQCC groundwater standard (20.6.2.3103 New Mexico Administrative Code).

**Table 5.3-1**
**Summary of Detected Tritium Results in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-25262, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **July 2009** | | | |
| MD21-09-11294 | 80–85 | 7/14/09 | 1041.73 |
| MD21-09-11295 | 115–120 | 7/14/09 | 441.102 |
| MD21-09-11296 | 232–237 | 7/14/09 | 556.992 |
| MD21-09-11297 | 295–300 | 7/14/09 | 3199.46 |
| MD21-09-11298 | 329.5–334.5 | 7/14/09 | 6803.85 |
| MD21-09-11299 | 375–380 | 7/14/09 | 37413.2 |
| MD21-09-11301 | 572–577 | 7/14/09 | 321.425 |
| MD21-09-11302 | 686–691 | 7/14/09 | 420.838 |
| **August 2009** | | | |
| MD21-09-11488 | 80–85 | 8/11/09 | 1129.79 |
| MD21-09-11489 | 115–120 | 8/11/09 | 516.154 |
| MD21-09-11490 | 232–237 | 8/11/09 | 930.317 |
| MD21-09-11491 | 295–300 | 8/13/09 | 3885.76 |
| MD21-09-11493 | 375–380 | 8/11/09 | 40119.3 |
| MD21-09-11492 | 329.5–334.5 | 8/13/09 | 5167.16 |
| MD21-09-11494 | 472–478 | 8/13/09 | 1401.18 |
| MD21-09-11495 | 572–577 | 8/14/09 | 33963.9 |
| MD21-09-11496 | 686–691 | 8/14/09 | 721.544 |
| **September 2009** | | | |
| MD21-09-12612 | 80–85 | 9/17/09 | 950.746 |
| MD21-09-12613 | 115–120 | 9/17/09 | 1566.48 |
| MD21-09-12614 | 232–237 | 9/17/09 | 638.959 |
| MD21-09-12615 | 295–300 | 9/17/09 | 3571.87 |
| MD21-09-12616 | 329.5–334.5 | 9/17/09 | 6374.78 |
| MD21-09-12617 | 375–380 | 9/17/09 | 58756.5 |
| MD21-09-12618 | 472–478 | 9/17/09 | 397.554 |
| **October 2009** | | | |
| MD21-10-35 | 295–300 | 10/19/09 | 5711.58 (J) |
| MD21-10-36 | 329.5–334.5 | 10/19/09 | 7315.18 (J) |
| MD21-10-37 | 375–380 | 10/19/09 | 73332.4 |
| **November 2009** | | | |
| MD21-10-5010 | 295–300 | 11/17/09 | 3194.14 |
| MD21-10-5011 | 329.5–334.5 | 11/17/09 | 4274.57 |
| MD21-10-5012 | 375–380 | 11/17/09 | 32455 |

**Table 5.3-1 (continued)**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **December 2009** | | | |
| MD21-10-8520 | 80–85 | 12/15/09 | 708.364 |
| MD21-10-8521 | 115–120 | 12/15/09 | 637.912 |
| MD21-10-8523 | 295–300 | 12/15/09 | 2905.18 |
| MD21-10-8524 | 329.5–334.5 | 12/15/09 | 3352.27 |
| MD21-10-8525 | 375–380 | 12/15/09 | 31335.5 |
| MD21-10-8526 | 472–478 | 12/15/09 | 593.241 |
| MD21-10-8527 | 572–577 | 12/15/09 | 598.132 |
| **January 2010** | | | |
| MD21-10-11413 | 80–85 | 1/21/10 | 666.957 |
| MD21-10-11414 | 115–120 | 1/21/10 | 578.64 |
| MD21-10-11415 | 232–237 | 1/21/10 | 6810.37 |
| MD21-10-11416 | 295–300 | 1/21/10 | 3608.86 |
| MD21-10-11417 | 329.5–334.5 | 1/21/10 | 4614.16 |
| MD21-10-11418 | 375–380 | 1/21/10 | 50511.2 |
| MD21-10-11419 | 472–478 | 1/21/10 | 448.292 |
| **February 2010** | | | |
| MD21-10-12278 | 80–85 | 2/10/10 | 497.31 |
| MD21-10-12279 | 115–120 | 2/10/10 | 376.898 |
| MD21-10-12280 | 232–237 | 2/10/10 | 628.359 |
| MD21-10-12281 | 295–300 | 2/10/10 | 3065.5 |
| MD21-10-12282 | 329.5–334.5 | 2/10/10 | 3742.27 |
| MD21-10-12283 | 375–380 | 2/10/10 | 37300.1 |
| MD21-10-12284 | 472–478 | 2/10/10 | 17788.4 |
| **March 2010** | | | |
| MD21-10-13989 | 80–85 | 3/17/10 | 773.446 |
| MD21-10-13990 | 115–120 | 3/17/10 | 623.036 |
| MD21-10-13991 | 232–237 | 3/17/10 | 477.933 |
| MD21-10-13992 | 295–300 | 3/17/10 | 3716.16 |
| MD21-10-13993 | 329.5–334.5 | 3/17/10 | 4605.93 |
| MD21-10-13994 | 375–380 | 3/17/10 | 55517.2 |
| **April 2010** | | | |
| MD21-10-15954 | 115–120 | 4/20/10 | 368.602 |
| MD21-10-15956 | 295–300 | 4/20/10 | 4528.6 |
| MD21-10-15957 | 329.5–334.5 | 4/20/10 | 4099.32 |
| MD21-10-15958 | 375–380 | 4/20/10 | 48780.4 |
| MD21-10-15961 | 686–691 | 4/20/10 | 458.742 |

**Table 5.3-1 (continued)**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **June 2010** | | | |
| MD21-10-19336 | 80–85 | 6/8/10 | 794.735 |
| MD21-10-19337 | 115–120 | 6/8/10 | 688.765 |
| MD21-10-19338 | 232–237 | 6/8/10 | 850.966 |
| MD21-10-19339 | 295–300 | 6/8/10 | 7451.7 |
| MD21-10-19340 | 329.5–334.5 | 6/8/10 | 4963.55 |
| MD21-10-19341 | 375–380 | 6/8/10 | 70353.9 |
| MD21-10-19344 | 686–691 | 6/8/10 | 863.464 |

Notes: Units are in pCi/L. See Appendix A for data qualifier definitions.

**Table 5.3-2**
**Summary of Detected Tritium Results in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-25264, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **July 2009** | | | |
| MD21-09-11283 | 67.5–72.5 | 07/17/09 | 10560.3 |
| MD21-09-11284 | 150.5–155.5 | 07/17/09 | 173113 |
| MD21-09-11285 | 222.5–227.5 | 07/17/09 | 123530 |
| MD21-09-11286 | 323–328 | 07/17/09 | 2323.85 |
| MD21-09-11287 | 349.5–354.5 | 07/17/09 | 7802.76 |
| **August 2009** | | | |
| MD21-09-11477 | 67.5–72.5 | 08/19/09 | 12.3201 |
| MD21-09-11478 | 150.5–155.5 | 08/19/09 | 198.29 |
| MD21-09-11479 | 222.5–227.5 | 08/19/09 | 143.559 |
| MD21-09-11480 | 323–328 | 08/19/09 | 2.95949 |
| MD21-09-11481 | 349.5–354.5 | 08/19/09 | 3.10597 |
| **September 2009** | | | |
| MD21-09-12605 | 67.5–72.5 | 09/16/09 | 8471.59 |
| MD21-09-12606 | 150.5–155.5 | 09/16/09 | 128286 |
| MD21-09-12607 | 222.5–227.5 | 09/16/09 | 98443.1 |
| MD21-09-12608 | 323–328 | 09/16/09 | 1847.38 |
| MD21-09-12609 | 349.5–354.5 | 09/16/09 | 2511.64 |
| **October 2009** | | | |
| MD21-10-25 | 67.5–72.5 | 10/16/09 | 7391.34 (J) |
| MD21-10-26 | 150.5–155.5 | 10/16/09 | 127242 |
| MD21-10-27 | 222.5–227.5 | 10/16/09 | 88576.4 |
| MD21-10-29 | 349.5–354.5 | 10/16/09 | 2091.07 (J) |
| **November 2009** | | | |
| MD21-10-5002 | 67.5–72.5 | 11/19/09 | 6934.95 |
| MD21-10-5003 | 150.5–155.5 | 11/19/09 | 129340 |
| MD21-10-5004 | 222.5–227.5 | 11/19/09 | 87464.5 |
| MD21-10-5005 | 323–328 | 11/19/09 | 2339.12 |
| MD21-10-5006 | 349.5–354.5 | 11/19/09 | 2621.98 |
| **December 2009** | | | |
| MD21-10-8509 | 67.5–72.5 | 12/22/09 | 6826.61 |
| MD21-10-8510 | 150.5–155.5 | 12/22/09 | 83723 |
| MD21-10-8511 | 222.5–227.5 | 12/22/09 | 57334 |
| MD21-10-8512 | 323–328 | 12/22/09 | 2319.62 |
| MD21-10-8513 | 349.5–354.5 | 12/22/09 | 1744.05 |

**Table 5.3-2 (continued)**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **January 2010** | | | |
| MD21-10-11406 | 67.5–72.5 | 1/28/10 | 7905.69 |
| MD21-10-11407 | 150.5–155.5 | 1/28/10 | 110471 |
| MD21-10-11408 | 222.5–227.5 | 1/28/10 | 81035.2 |
| MD21-10-11409 | 323–328 | 1/28/10 | 1367.84 |
| MD21-10-11410 | 349.5–354.5 | 1/28/10 | 1928.84 |
| **February 2010** | | | |
| MD21-10-12271 | 67.5–72.5 | 2/16/10 | 7098.53 |
| MD21-10-12272 | 150.5–155.5 | 2/16/10 | 125555 |
| MD21-10-12273 | 222.5–227.5 | 2/16/10 | 77988.9 |
| MD21-10-12274 | 323–328 | 2/16/10 | 1968.92 |
| MD21-10-12275 | 349.5–354.5 | 2/16/10 | 1549.69 |
| **March 2010** | | | |
| MD21-10-13984 | 67.5–72.5 | 3/23/10 | 8021.56 |
| MD21-10-13985 | 150.5–155.5 | 3/23/10 | 112468 |
| MD21-10-13986 | 222.5–227.5 | 3/23/10 | 94845.8 |
| MD21-10-13987 | 323–328 | 3/23/10 | 1972.37 |
| MD21-10-13988 | 349.5–354.5 | 3/23/10 | 2108.49 |
| **April 2010** | | | |
| MD21-10-15946 | 67.5–72.5 | 4/27/10 | 9896.15 |
| MD21-10-15947 | 150.5–155.5 | 4/27/10 | 155156 |
| MD21-10-15948 | 222.5–227.5 | 4/27/10 | 113205 |
| MD21-10-15949 | 323–328 | 4/27/10 | 1910.17 |
| MD21-10-15950 | 349.5–354.5 | 4/27/10 | 2302.14 |
| **June 2010** | | | |
| MD21-10-19329 | 67.5–72.5 | 6/14/10 | 12316.3 |
| MD21-10-19330 | 150.5–155.5 | 6/14/10 | 191459 |
| MD21-10-19331 | 222.5–227.5 | 6/14/10 | 137228 |
| MD21-10-19332 | 323–328 | 6/14/10 | 2386.97 |
| MD21-10-19333 | 349.5–354.5 | 6/14/10 | 3245.28 |

Notes: Units are in pCi/L. See Appendix A for data qualifier definitions.

**Table 5.3-3**
**Summary of Detected Tritium Results in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-603058, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **July 2009** | | | |
| MD21-09-11280 | 217–222 | 7/16/09 | 980.78 |
| MD21-09-11281 | 242.5–247.5 | 7/16/09 | 3253.15 |
| **August 2009** | | | |
| MD21-09-11472 | 67.5–72.5 | 8/18/09 | 258.446 |
| MD21-09-11473 | 217–222 | 8/18/09 | 991.636 |
| MD21-09-11474 | 242.5–247.5 | 8/18/09 | 2949.12 |
| **September 2009** | | | |
| MD21-09-12598 | 67.5–72.5 | 9/15/09 | 1706.59 |
| MD21-09-12600 | 217–222 | 9/15/09 | 1936.29 |
| MD21-09-12601 | 242.5–247.5 | 9/15/09 | 1787.14 |
| **November 2009** | | | |
| MD21-10-4997 | 67.5–72.5 | 11/20/09 | 1394.73 |
| MD21-10-4998 | 217–222 | 11/20/09 | 1380.68 |
| MD21-10-4999 | 242.5–247.5 | 11/20/09 | 116521 |
| MD21-10-5000 | 339.5–344.5 | 11/20/09 | 368.266 |
| **December 2009** | | | |
| MD21-10-8504 | 67.5–72.5 | 12/21/09 | 482.944 |
| MD21-10-8506 | 217–222 | 12/21/09 | 1101.48 |
| MD21-10-8507 | 242.5–247.5 | 12/21/09 | 1591.23 |
| **January 2010** | | | |
| MD21-10-11401 | 217–222 | 1/27/10 | 822.176 |
| MD21-10-11402 | 242.5–247.5 | 1/27/10 | 1892.62 |
| **February 2010** | | | |
| MD21-10-12266 | 217–222 | 2/17/10 | 4700.82 |
| MD21-10-12267 | 242.5–247.5 | 2/17/10 | 5631.82 |
| MD21-10-12268 | 339.5–344.5 | 2/17/10 | 573.583 |
| **March 2010** | | | |
| MD21-10-13979 | 217–222 | 3/22/10 | 1037.35 |
| MD21-10-13980 | 242.5–247.5 | 3/22/10 | 431.92 |
| **April 2009** | | | |
| MD21-10-15941 | 217–222 | 4/26/10 | 808.326 |
| MD21-10-15942 | 242.5–247.5 | 4/26/10 | 2467.84 |
| **June 2010** | | | |
| MD21-10-19324 | 217–222 | 6/15/10 | 579.68 |
| MD21-10-19325 | 242.5–247.5 | 6/15/10 | 2396.42 |

Note: Units are in pCi/L.

**Table 5.3-4**
**Summary of Detected Tritium Results in Pore-Gas Samples at MDA T Vapor-Monitoring Well 21-603059, July 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **July 2009** | | | |
| MD21-09-11273 | 187.5–192.5 | 7/15/09 | 601.61 |
| MD21-09-11274 | 229.5–234.5 | 7/15/09 | 1428.52 |
| MD21-09-11275 | 292.5–297.5 | 7/15/09 | 4776.39 |
| MD21-09-11276 | 372.5–377.5 | 7/15/09 | 6527.3 |
| **August 2009** | | | |
| MD21-09-11469 | 77.5–82.5 | 8/14/09 | 501.312 |
| MD21-09-11470 | 187.5–192.5 | 8/14/09 | 538.605 |
| MD21-09-11471 | 229.5–234.5 | 8/14/09 | 1529.32 |
| MD21-09-11468 | 292.5–297.5 | 8/14/09 | 6175.57 |
| MD21-09-11467 | 372.5–377.5 | 8/14/09 | 6520.03 |
| **September 2009** | | | |
| MD21-09-12623 | 77.5–82.5 | 9/18/09 | 889.354 |
| MD21-09-12624 | 187.5–192.5 | 9/18/09 | 376.235 |
| MD21-09-12625 | 229.5–234.5 | 9/18/09 | 1400.04 |
| MD21-09-12626 | 292.5–297.5 | 9/18/09 | 5764.99 |
| MD21-09-12627 | 372.5–377.5 | 9/18/09 | 1279.39 |
| **October 2009** | | | |
| MD21-10-13 | 292.5–297.5 | 10/20/09 | 2720.89 (J) |
| MD21-10-14 | 372.5–377.5 | 10/20/09 | 4812.58 (J) |
| **November 2009** | | | |
| MD21-10-4991 | 77.5–82.5 | 11/18/09 | 569.51 |
| MD21-10-4993 | 187.5–192.5 | 11/18/09 | 835.233 |
| MD21-10-4994 | 229.5–234.5 | 11/18/09 | 2006.55 |
| MD21-10-4995 | 292.5–297.5 | 11/18/09 | 3811.4 |
| MD21-10-4996 | 372.5–377.5 | 11/18/09 | 5400.51 |
| **December 2009** | | | |
| MD21-10-8498 | 77.5–82.5 | 12/16/09 | 412.571 |
| MD21-10-8499 | 187.5–192.5 | 12/16/09 | 904.787 |
| MD21-10-8500 | 229.5–234.5 | 12/16/09 | 23765.4 |
| MD21-10-8501 | 292.5–297.5 | 12/16/09 | 2450.99 |
| MD21-10-8502 | 372.5–377.5 | 12/16/09 | 6361.8 |
| **January 2010** | | | |
| MD21-10-11394 | 229.5–234.5 | 1/20/10 | 903.819 |
| MD21-10-11395 | 292.5–297.5 | 1/20/10 | 4559.34 |
| MD21-10-11396 | 372.5–377.5 | 1/20/10 | 6145.92 |

**Table 5.3-4 (continued)**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **February 2010** | | | |
| MD21-10-12256 | 77.5–82.5 | 2/10/10 | 259.625 |
| MD21-10-12258 | 187.5–192.5 | 2/10/10 | 517.941 |
| MD21-10-12259 | 229.5–234.5 | 2/10/10 | 1501.71 |
| MD21-10-12260 | 292.5–297.5 | 2/10/10 | 4071.49 |
| MD21-10-12261 | 372.5–377.5 | 2/10/10 | 4866.67 |
| **March 2010** | | | |
| MD21-10-13972 | 187.5–192.5 | 3/16/10 | 1102.95 |
| MD21-10-13973 | 229.5–234.5 | 3/16/10 | 884.006 |
| MD21-10-13974 | 292.5–297.5 | 3/16/10 | 3606.05 |
| MD21-10-13975 | 372.5–377.5 | 3/16/10 | 4007.93 |
| **April 2010** | | | |
| MD21-10-15936 | 229.5-234.5 | 4/21/10 | 740.522 |
| MD21-10-15937 | 292.5-297.5 | 4/21/10 | 1928.12 |
| MD21-10-15938 | 372.5-377.5 | 4/21/10 | 5139.03 |
| **June 2010** | | | |
| MD21-10-19316 | 187.5-192.5 | 6/9/10 | 339.864 |
| MD21-10-19317 | 229.5-234.5 | 6/9/10 | 1171.78 |
| MD21-10-19318 | 292.5-297.5 | 6/9/10 | 5519.79 |
| MD21-10-19319 | 372.5-377.5 | 6/9/10 | 5504.98 |

Notes: Units are in pCi/L. See Appendix A for data qualifier definitions.

**Table 5.3-5**
**Summary of Detected Tritium Results in Pore-Gas Samples at**
**MDA T Vapor-Monitoring Well 21-607955, November 2009–June 2010**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| **November/December 2009** | | | |
| MD21-10-7567 | 71.1–76.4 | 12/2/2009 | 1005.55 |
| MD21-10-7568 | 153.8–159.7 | 12/3/2009 | 3022.43 |
| MD21-10-7569 | 173.4–179 | 12/2/2009 | 1350.52 |
| MD21-10-7570 | 225.9–232.1 | 12/2/2009 | 4580.07 |
| MD21-10-7571 | 326.6–333.4 | 12/3/2009 | 1201.62 |
| MD21-10-7572 | 353.3–359.6 | 12/2/2009 | 694.773 |
| MD21-10-7573 | 459.4–464.8 | 12/2/2009 | 424.773 |
| MD21-10-7574 | 559–565 | 12/2/2009 | 1143.6 |
| MD21-10-7577 | 946.2–952.1 | 12/3/2009 | 844.549 |
| **December 2009** | | | |
| MD21-10-8099 | 71.1–76.4 | 12/18/09 | 1699.46 |
| MD21-10-8100 | 153.8–159.7 | 12/18/09 | 20563 |
| MD21-10-8101 | 173.4–179 | 12/18/09 | 1280.33 |
| MD21-10-8102 | 225.9–232.1 | 12/17/09 | 5367.56 |
| MD21-10-8103 | 326.6–333.4 | 12/17/09 | 551.331 |
| MD21-10-8106 | 559–565 | 12/17/09 | 626.66 |
| MD21-10-8107 | 651–657 | 12/18/09 | 504.147 |
| **January 2010** | | | |
| MD21-10-11424 | 71.1–76.4 | 1/25/10 | 2794.02 |
| MD21-10-11425 | 153.8–159.7 | 1/25/10 | 26367.4 |
| MD21-10-11426 | 173.4–179 | 1/25/10 | 951.95 |
| MD21-10-11427 | 225.9–232.1 | 1/25/10 | 3654.21 |
| MD21-10-11428 | 326.6–333.4 | 1/25/10 | 24955.1 |
| MD21-10-11429 | 353.3–359.6 | 1/25/10 | 444.253 |
| MD21-10-11430 | 459.4–464.8 | 1/25/10 | 681.335 |
| MD21-10-11432 | 651.3–657.3 | 1/26/10 | 661.971 |
| MD21-10-11433 | 797.2–803.1 | 1/26/10 | 852.999 |
| MD21-10-11434 | 946.2–952.1 | 1/26/10 | 444.672 |
| **February 2010** | | | |
| MD21-10-12289 | 71.1–76.4 | 2/12/10 | 1619 |
| MD21-10-12290 | 153.8–159.7 | 2/12/10 | 21115.3 |
| MD21-10-12291 | 173.4–175 | 2/12/10 | 1478.55 |
| MD21-10-12292 | 225.9–232.1 | 2/12/10 | 7708.75 |
| MD21-10-12293 | 326.6–333.9 | 2/12/10 | 482.873 |
| MD21-10-12294 | 353.3–359.6 | 2/12/10 | 1207.58 |
| MD21-10-12295 | 459.4–464.8 | 2/12/10 | 382.637 |

**Table 5.3-5 (continued)**

| Sample ID | Depth (ft) | Collection Date | Tritium |
|---|---|---|---|
| MD21-10-12296 | 559–565 | 2/12/10 | 651.75 |
| MD21-10-12299 | 946.2–952.1 | 2/15/10 | 346.154 |
| **March 2010** | | | |
| MD21-10-14000 | 71.1–76.4 | 3/18/10 | 2640.15 |
| MD21-10-14001 | 153.8–159.7 | 3/18/10 | 31031.8 |
| MD21-10-14002 | 173.4–179 | 3/18/10 | 1251.55 |
| MD21-10-14003 | 225.9–232.1 | 3/18/10 | 6979.23 |
| MD21-10-14005 | 353.3–359.6 | 3/18/10 | 1067.42 |
| MD21-10-14008 | 651.3–657.3 | 3/18/10 | 888.596 |
| MD21-10-14010 | 946.2–952.1 | 3/19/10 | 712.071 |
| **April 2010** | | | |
| MD21-10-15964 | 71.1–76.4 | 4/22/10 | 3161.38 |
| MD21-10-15965 | 153.8–159.7 | 4/22/10 | 29255.8 |
| MD21-10-15966 | 173.4–179 | 4/22/10 | 1068.61 |
| MD21-10-15967 | 225.9–232.1 | 4/22/10 | 7591.41 |
| MD21-10-15970 | 459.4–464.8 | 4/22/10 | 653.514 |
| MD21-10-15974 | 946.2–952.1 | 4/23/10 | 545.066 |
| **June 2010** | | | |
| MD21-10-19349 | 71.1–76.4 | 6/10/10 | 4714.05 |
| MD21-10-19350 | 153.8–159.7 | 6/10/10 | 41991.3 |
| MD21-10-19351 | 173.4–179 | 6/10/10 | 1543.31 |
| MD21-10-19352 | 225.9–232.1 | 6/10/10 | 10793.9 |
| MD21-10-19354 | 353.3–359.6 | 6/10/10 | 328.215 |
| MD21-10-19355 | 459.4–464.8 | 6/10/10 | 309.404 |

Note: Units are in pCi/L.

# Appendix A

*Acronyms and Abbreviations,*
*Metric Conversion Table, and Data Qualifier Definitions*

## A-1.0 ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| %R | percent recovery |
| bgs | below ground surface |
| CCV | continuing calibration verification |
| COC | chain of custody |
| DER | duplicate error ratio |
| DOE | Department of Energy (U.S.) |
| EPA | Environmental Protection Agency (U.S.) |
| FB | field blank |
| FD | field duplicate |
| ICV | initial calibration verification |
| LANL | Los Alamos National Laboratory |
| LCS | laboratory control sample |
| MCL | maximum contaminant level |
| MDA | material disposal area |
| MDC | minimum detectable concentration |
| MDL | method detection limit |
| NES | nuclear environmental site |
| NMED | New Mexico Environment Department |
| NMWQCC | New Mexico Water Quality Control Commission |
| MS | matrix spike |
| PB | performance blank |
| PCE | tetrachloroethene |
| PQL | practical quantitation limit |
| QA | quality assurance |
| QC | quality control |
| RACER | Risk Analysis, Communication, Evaluation, and Reduction |
| RPF | Records Processing Facility |
| SCL | sample collection log |
| SL | screening level |
| SMO | Sample Management Office |
| SOP | standard operating procedure |
| SOW | statement of work |
| SQL | standard quantitation limit |
| SV | screening value |

| | |
|---|---|
| TA | technical area |
| TCE | trichloroethene |
| TD | total depth |
| UAL | upper acceptance limit |
| VOC | volatile organic compound |

## A-2.0 METRIC CONVERSION TABLE

| Multiply SI (Metric) Unit | by | To Obtain U.S. Customary Unit |
|---|---|---|
| kilometers (km) | 0.622 | miles (mi) |
| kilometers (km) | 3281 | feet (ft) |
| meters (m) | 3.281 | feet (ft) |
| meters (m) | 39.37 | inches (in.) |
| centimeters (cm) | 0.03281 | feet (ft) |
| centimeters (cm) | 0.394 | inches (in.) |
| millimeters (mm) | 0.0394 | inches (in.) |
| micrometers or microns (µm) | 0.0000394 | inches (in.) |
| square kilometers ($km^2$) | 0.3861 | square miles ($mi^2$) |
| hectares (ha) | 2.5 | acres |
| square meters ($m^2$) | 10.764 | square feet ($ft^2$) |
| cubic meters ($m^3$) | 35.31 | cubic feet ($ft^3$) |
| kilograms (kg) | 2.2046 | pounds (lb) |
| grams (g) | 0.0353 | ounces (oz) |
| grams per cubic centimeter ($g/cm^3$) | 62.422 | pounds per cubic foot ($lb/ft^3$) |
| milligrams per kilogram (mg/kg) | 1 | parts per million (ppm) |
| micrograms per gram (µg/g) | 1 | parts per million (ppm) |
| liters (L) | 0.26 | gallons (gal.) |
| milligrams per liter (mg/L) | 1 | parts per million (ppm) |
| degrees Celsius (°C) | 9/5 + 32 | degrees Fahrenheit (°F) |

## A-3.0 DATA QUALIFIER DEFINITIONS

| Data Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for but not detected. |
| J | The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis. |
| J+ | The analyte was positively identified, and the result is likely to be biased high. |
| J- | The analyte was positively identified, and the result is likely to be biased low. |
| UJ | The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit. |
| R | The data are rejected as a result of major problems with quality assurance/quality control parameters. |

# Appendix B

*Field Methods*

## B-1.0 INTRODUCTION

This appendix summarizes the field methods used during the April to June 2010 quarterly sampling at Material Disposal Area (MDA) T, Consolidated Unit 21-016(a)-99, in Technical Area 21 at Los Alamos National Laboratory (LANL or the Laboratory). All activities were conducted in accordance with the applicable standard operating procedures (SOPs), quality procedures, Laboratory implementation requirements, and Laboratory procedural requirements. Table B-1.0-1 summarizes the field methods used, and Table B-1.0-2 lists the applicable procedures.

## B-2.0 FIELD METHODS

All work was conducted per a site-specific health and safety plan and an integrated work document. Field activities conducted according to SOPs are discussed below.

### B-2.1 Volatile Organic Compound Pore-Gas Field-Screening and Sample Collection

All volatile organic compound (VOC) samples were collected and screened in accordance with the current version of the SOP-5074, Sampling for Sub-Atmospheric Air.

Before each sampling event, each sample port was purged and monitored with a LANDTEC GEM 2000 instrument (or equivalent) until the percent carbon dioxide (%$CO_2$) and percent oxygen (%$O_2$) levels stabilized at values representative of subsurface pore-gas conditions. Each instrument rental was shipped factory calibrated to the Laboratory and then returned to a LANDTEC authorized service facility for service/calibration as needed. As described in the LANDTEC documentation, accuracies for percent oxygen and carbon dioxide for Landtec instrumentation are +/– 1.0% and +/– 3.0%, respectively. Air was drawn from the sampling interval through the line to purge vapor-sample tubing of stagnant air. To ensure the sample collected was representative of the subsurface air at depth, every sampling activity included a purge cycle. Once purging and field screening were complete, vapor samples for VOC analysis were collected with the use of SUMMA canisters, and the sample information was recorded in the appropriate sample collection log (SCL). Field-screening results were also recorded in the appropriate SCL and/or in the field logbook. Field chains of custody (COCs) and SCLs are provided in Appendix D (on CD).

The screening %$CO_2$ and %$O_2$ levels are presented in Table 4.0-1 of the monitoring report. The calibrations of $CO_2$ and $O_2$ levels were within the manufacturer's acceptable calibration limits. The April and June 2010 %$CO_2$ levels ranged from 0.0% to 1.1%, which are within acceptable limits, and are representative of subsurface pore-gas conditions. The April and June 2010 %$O_2$ levels ranged from 15.0% to 20.8%, are within acceptable limits, and are representative of subsurface pore-gas conditions. In addition to the characterization samples, two types of quality assurance/quality control (QA/QC) samples were collected and analyzed for VOCs with the use of SUMMA canisters: field duplicate (FD) samples and field blanks (FB) of ultra-pure nitrogen. The FD and FB samples were collected at a frequency greater than or equal to 10% per sampling event in accordance with the current version of SOP-5059, Field Quality Control Samples. Summaries of all April and June 2010 analytical and QA/QC samples collected from vapor-monitoring wells 21-603058, 21-603059, 21-25264, 21-25262, 21-607955, and their requested analyses, are presented in Tables 2.0-2 through 2.0-6 of the monitoring report.

All samples were submitted to the Sample Management Office (SMO) for processing and transport to off-site contract analytical laboratories.

### B-2.2 Tritium Pore-Gas Sample Collection

All tritium samples were collected in accordance with the current version of SOP-5074. Water vapor intended for tritium analysis was collected from pore gas by means of pulling a pore-gas sample through a canister of silica gel and the sample information recorded on the appropriate SCL (Appendix D [on CD]). Silica gel column FD samples were also collected at a frequency greater than or equal to 10% per sampling event in accordance with the current version of SOP-5059.

Following delivery of the canister and silica gel sample to the analytical laboratory, the silica gel was heated, and the moisture driven off was collected for liquid scintillation counting. Silica gel was prepared for sampling by drying at a temperature above 100$^{o}$C. Before sample collection, the amount of silica gel used in each sample was weighed (typically about 135 g), as well as the sample canister with silica gel. SOP-5074 requires that at least 5 g of moisture be collected. After sampling, sample canister with silica gel was weighed again.

The sample (canister plus silica gel) was shipped to the analytical laboratory where the canister with silica gel was weighed again. The silica gel was emptied into a distillation apparatus and heated to 110°C, driving moisture off the silica gel. This moisture was collected and analyzed for tritium by liquid scintillation. The analytical laboratory also weighed the empty canister and calculated the percent moisture of the sample, as the amount of moisture collected divided by the calculated weight of the wet silica gel. The value of the tritium concentration and the calculated percent moisture were reported to the Laboratory in the analytical data package and the electronic data deliverable.

**Table B-1.0-1**
**Summary of Field Methods**

| Method | Summary |
|---|---|
| General Instructions for Field Investigations | This procedure provides an overview of instructions regarding activities performed before, during, and after field investigations. It is assumed field investigations involved standard sampling equipment, personal protective equipment, waste management, and site-control equipment/materials. The procedure covers premobilization activities, mobilization to the site, documentation and sample collection activities, sample media evaluation, surveillance, and completion of lessons learned. |
| Sample Containers and Preservation | Specific requirements/processes for sample containers, preservation techniques, and holding times are based on the U.S. Environmental Protection Agency guidance for environmental sampling, preservation, and QA. Specific requirements were met for each sample and were printed in the sample collection logs provided by the Laboratory's SMO (size and type of container, preservatives, etc.) |
| Handling, Packaging, and Transporting Field Samples | Field team members sealed and labeled samples before packing to ensure sample and transport containers were free of external contamination. All environmental samples were collected, preserved, packaged, and transported to the SMO under COC. The SMO arranged to ship the samples to analytical laboratories. Any levels of radioactivity (i.e., action-level or limited-quantity ranges) were documented in SCLs submitted to the SMO. |
| Sample Control and Field Documentation | The collection, screening, and transport of samples were documented in standard forms generated by the SMO. These forms include SCLs, COC forms, sample container labels, and custody seals. Collection logs were completed at the time of sample collection and were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around container lids or openings. COC forms were completed and signed to verify that the samples were not left unattended. |
| Field QC Samples | Field QC samples were collected as follows:<br>FDs were collected at a frequency of 10% at the same time as a regular sample and submitted for the same analyses.<br>FBs required for all field events that include collecting samples for VOC analyses were collected. Field blanks were kept with the other sample containers during the sampling process and were submitted for laboratory analyses. |
| Sampling of Sub-Atmospheric Air | Vapor sampling was performed on three monitoring wells in accordance with the current version of SOP-5074 and analyzed for VOCs and tritium. This SOP describes the process of sampling subatmospheric air from vapor ports in monitoring wells and boreholes. The vapor-sampling procedure covers presampling activities, sampling to detect and quantify gaseous organic concentration in air, SUMMA sampling (a passive collection and containment system of laboratory-quality air samples), adsorbent column sampling, and sampling through the packer system (a sampling system that uses inflatable bladders to seal off a desired interval in an open borehole or at the end of drill casing to obtain a sample from a discrete section), and postsampling activities. |

**Table B-1.0-2**
**List of Applicable General Procedures for MDA T Pore-Gas Monitoring Activities**

| Document Number | LANL Procedure Title |
|---|---|
| SOP-5055 | General Instructions for Field Investigations |
| SOP-5056 | Sample Containers and Preservation |
| SOP-5057 | Handling, Packaging, and Transporting Field Samples |
| SOP-5058 | Sample Control and Field Documentation |
| SOP-5059 | Field Quality Control Samples |
| SOP-5061 | Field Decontamination of Equipment |
| SOP-5074 | Sampling for Sub-Atmospheric Air |
| P 101-6 | Personal Protective Equipment |
| SOP-01.12 | Field Site Closeout Checklist |
| SOP-01.13 | Initiating and Managing Data Set Requests |
| SOP-5181 | Notebook Documentation for Environmental Restoration Technical Activities |
| SOP-5228 | ADEP Reporting Requirements for Abnormal Events |

# Appendix C

*Quality Assurance/Quality Control Program*

## C-1.0 INTRODUCTION

This appendix presents the analytical methods and summarizes the data quality review for pore-gas samples collected during the April to June 2010 monitoring activities at Material Disposal Area (MDA) T, Consolidated Unit 21-016(a)-99, in Technical Area 21 at Los Alamos National Laboratory (LANL or the Laboratory).

Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the "Quality Assurance Project Plan Requirements for Sampling and Analysis" (LANL 1996, 054609), and the Laboratory's statement of work (SOW) for analytical services (LANL 2000, 071233). The results of the QA/QC activities were used to estimate the accuracy, bias, and precision of the analytical measurements. QC samples, including method blanks, matrix spikes (MSs), laboratory control samples (LCSs), internal standards, initial calibration verifications (ICVs) and continuing calibration verifications (CCVs), surrogates, and tracers, were used to assess analytical laboratory accuracy and bias.

The type and frequency of QC analyses are described in the analytical services SOW (LANL 2000, 071233). Other QC factors such as sample preservation and holding times were also assessed. The requirements for sample preservation and holding times are presented in the Standard Operating Procedure (SOP) 5056, Sample Containers and Preservation. Evaluating these QC indicators allows estimates to be made of the accuracy, bias, and precision of the analytical suites. A focused data validation was also performed for all the data packages (identified by request number) that included a more detailed review of the raw data results. The SOPs used for data validation are presented in Table C-1.0-1. Copies of the analytical data, laboratory logbooks, and instrument printouts are provided in Appendix D (on CD).

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) national functional guidelines for organic chemical data review, where applicable (EPA 1994, 048639; EPA 1999, 066649). Data have also been assessed using guidelines established in SW-846 (EPA 1997, 057589). As a result of the data validation and assessment efforts, qualifiers have been assigned to the appropriate analytical records. Definitions of the data qualifiers are presented in Appendix A.

## C-2.0 ANALYTICAL DATA ORGANIZATION AND VINTAGE

The pore-gas analytical data were obtained from samples collected during two sampling events in April and June 2010 from vapor-monitoring well locations 21-25262, 21-25264, 21-603058, 21-603059 and 21-607955. Complete data packages and sample documentation for the 2010 samples are provided in Appendix D (on CD).

## C-3.0 ORGANIC CHEMICAL ANALYSIS METHODS

Pore-gas samples were submitted for analysis of volatile organic compounds (VOCs) using EPA Method TO-15 (Table C-3.0-1). Tables 2.0-2 through 2.0-6 of the periodic monitoring report summarize the April and June 2010 pore-gas samples collected at MDA T and the requested analyses, in addition to July 2009 to March 2010 data, which are included for comparison purposes. All VOC results are provided on CD in Appendix D.

### C-3.1 Organic Chemical QA/QC Samples

The QC samples are designed to produce a qualitative measure of the reliability of a specific part of an analytical procedure. The methods for validating organic chemical results on the basis of the various QA/QC sample types are specified in the SOPs. The validation of organic chemical data using QA/QC samples and other methods may have resulted in the rejection of the data or the assignment of various qualifiers to individual sample results.

Calibration verifications, LCSs, method blanks, surrogates, and internal standards were analyzed to assess the accuracy and precision of organic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 2000, 071233), described in the applicable validation SOPs, and summarized below.

Calibration verification is the establishment of a quantitative relationship between the response of the analytical instrument and the concentration of the target analyte. There are two aspects of calibration verification: initial and continuing. The initial calibration verifies the linearity of the calibration curve as well as the individual calibration standards used to perform the calibration. The continuing calibration verifies the initial calibration is still linear and valid. The continuing calibration also serves to determine that analyte identification criteria, such as retention times and spectral matching, are being met.

The LCS is a sample of the same matrix spiked with the target analytes and serves to monitor the overall performance. Following Laboratory SOP guidance, analytical results were qualified if the individual LCS recoveries were not within method-specific acceptance criteria.

A method blank is an analyte-free matrix to which reagents are added in the same volumes or proportions as those used in the environmental sample processing and is extracted and analyzed in the same manner as the corresponding environmental samples. Method blanks are used to assess the potential for sample contamination during extraction and analysis.

A surrogate compound (surrogate) is an organic chemical used in the analyses of target analytes. The surrogate is similar in composition and behavior to the target analytes but is not normally found in environmental samples. Surrogates are added to every blank, sample, and spike to evaluate the efficiency with which analytes are recovered during extraction and analysis. The recovery percentage of the surrogates must be within specified ranges, or the sample may be rejected or assigned a qualifier.

Internal standards are chemical compounds added to every blank, sample, and standard extract at a known concentration. Internal standards are used as the basis for quantitation of target analytes. The percent recovery (%R) for internal standards should be within the range of 50% to 200%.

The data quality of the April and June 2010 MDA T VOC pore-gas data is summarized below.

#### C-3.1.1 MDA T Pore-Gas VOC Data

During the April–June 2010 monitoring period, 68 characterization samples and 17 QA/QC samples were collected and submitted for VOC analysis.

No VOC data were rejected.

Two VOC results were qualified as estimated (J) because the sample result was reported as detected between the practical quantitation limit (PQL) and the MDL (method detection limit).

Thirteen VOC results were qualified as estimated (J) and 28 VOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

Thirteen VOC results were qualified as estimated and biased high (J+) because the LCS %R was greater than the upper acceptance limit (UAL).

A total of 101 VOC results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with an initial calibration curve that exceeded the %R standard deviation criteria and/or the associated multipoint calibration correlation coefficient is less than 0.995.

## C-4.0 RADIONUCLIDE ANALYSIS METHODS

The vapor samples collected in April and June 2010 were analyzed by EPA Method 906.0 for tritium (Table C-3.0-1). Tables 2.0-2 through 2.0-6 of the periodic monitoring report summarize all April and June 2010 pore-gas samples collected at MDA T and the requested analyses, in addition to July 2009 to March 2010 data, which are included for comparison purposes. All tritium results are provided on CD in Appendix D.

### C-4.1 Radionuclide QA/QC Samples

The minimum detectable concentration (MDC) for tritium in performance blanks (PBs), method blanks, laboratory duplicates, tracer/carrier recovery, LCSs, and MS samples was analyzed to assess the accuracy and precision of the radionuclide analysis. The qualifiers and sample types for radionuclides are defined in the analytical services SOW (LANL 1995, 049738; LANL 2000, 071233), described in the applicable validation SOPs, and discussed briefly below. The validation of radionuclide data using QA/QC samples and other methods may have resulted in the rejection of data or the assignment of various qualifiers to individual sample results.

The MDC for each radionuclide is defined as the minimum activity concentration the analytical laboratory equipment can detect in 95% of the analyzed samples and is used to assess analytical performance.

Uncertainty and MDC results for tritium have been modified in the same manner as the analytical results to account for the bound water found in silica gel used for sample collection.

The PBs and method blanks are used to measure bias and assess potential cross-contamination of samples during preparation and analysis. Blank results should be less than the MDC for each radionuclide.

Laboratory duplicates are used to assess or demonstrate acceptable laboratory method precision at the time of analysis, as well as to assess the long-term precision of an analytical method on various matrices. Duplicate results are used to calculate a duplicate error ratio (DER). The DER is based on 1 standard deviation of the sample and the duplicate sample and should be less than 3.5.

The LCS serves as a monitor of the overall performance of each step during the analysis, and the acceptance criteria for LCSs are method-specific. For radionuclide methods, LCS %Rs should fall within the control limits of 80% to 120%.

The accuracy of radionuclide analyses is also assessed using MS samples. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS %Rs should be within the acceptance range of 75% to 125%; however, if the sampling result is more than 4 times the amount of the spike added, these acceptance criteria do not apply.

The quality of the April and June 2010 MDA T tritium data is summarized below.

### C-4.1.1 MDA T Pore-Gas Tritium Data

During the April–June 2010 monitoring period, 68 characterization samples and 10 QA/QC samples were collected and submitted for tritium analysis.

A total of 23 tritium results were qualified as U because the associated sample concentration was less than or equal to the MDC.

All tritium data collected in April and June 2010 from MDA T pore gas were used to evaluate tritium trends over the monitoring period.

## C-5.0 REFERENCES

*The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.*

*Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.*

EPA (U.S. Environmental Protection Agency), February 1994. "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," EPA-540/R-94/013, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1994, 048639)

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**Table C-1.0-1**
**Data Validation Procedures**

| Procedure | Title | Effective Date |
|---|---|---|
| SOP-5161, Rev. 0 | Routine Validation of Volatile Organic Compound Analytical Data | 6/10/2008 |
| SOP-5166, Rev. 0 | Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data | 6/30/2008 |

**Table C-3.0-1**
**Analytical Methods for MDA T Pore-Gas Samples**

| Analytical Method | Analytical Description | Analytical Suite |
|---|---|---|
| EPA Method TO-15 | Gas Chromatography/Mass Spectrometry | VOC |
| EPA Method 906 | Liquid Scintillation | Tritium |

# Appendix D

*Analytical Suites and Results and Analytical Reports*
*(on CD included with this document)*