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**Periodic Monitoring Report for  
Vapor-Sampling Activities at  
Material Disposal Area H, Solid  
Waste Management Unit 54-004,  
at Technical Area 54,  
Third Quarter Fiscal Year 2011**

Prepared by the Environmental Programs Directorate

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# Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Third Quarter Fiscal Year 2011

October 2011

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## **EXECUTIVE SUMMARY**

This periodic monitoring report summarizes vapor-monitoring activities conducted during the third quarter of fiscal year (FY) 2011 at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54, at Los Alamos National Laboratory. The objectives of vapor monitoring at MDA H are to (1) collect additional vapor samples from vapor-monitoring wells at MDA H and (2) compare sampling results with previously detected volatile organic compound (VOC) concentrations and tritium activities in pore gas beneath and surrounding MDA H.

Vapor monitoring included field screening and collecting vapor samples from four vapor-monitoring wells. Vapor samples were submitted for laboratory analysis of VOCs and tritium. The results of the detected VOCs in MDA H pore gas during the third quarter of FY2011 were similar to previous sampling results. The VOC screening evaluation did not identify any VOCs in MDA H pore gas at concentrations exceeding screening levels that are based on groundwater screening levels. All VOC concentrations in the deepest ports sampled at MDA H were low or nondetect and did not exceed screening values.

The results of the detected tritium activities in MDA H during the third quarter of FY2011 were similar to previous sampling results.



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## 1.0 INTRODUCTION

This periodic monitoring report (PMR) presents the results of vapor-monitoring activities conducted during the third quarter of fiscal year (FY) 2011 at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54 (TA-54), at Los Alamos National Laboratory (LANL or the Laboratory). These activities are being conducted per the requirements outlined in the New Mexico Environment Department's (NMED's) June 23, 2009, letter to the Laboratory (NMED 2009, 106234) and the approved MDA H well installation work plan (LANL 2009, 106802; NMED 2009, 107653).

The objectives of the MDA H vapor-monitoring activities are to (1) collect additional vapor samples from vapor-monitoring wells at MDA H and (2) compare sampling results with previously detected volatile organic compound (VOC) concentrations and tritium activities in pore gas beneath and surrounding MDA H.

This report discusses the results obtained during the latest quarterly monitoring activities; however, for comparison, vapor data from the previous three quarterly PMRs, fourth quarter of FY2010 and first and second quarters of FY2011 (LANL 2010, 111360; LANL 2011, 201569; LANL 2011, 203602), at MDA H are also included in the data evaluation section of this report. Vapor monitoring included field screening and collecting vapor samples from stainless-steel sampling ports in vapor-monitoring wells. All pore-gas samples were submitted for off-site analysis of VOCs and tritium.

No regulatory criteria exist for vapor-phase contaminants; therefore, this report presents the results of a screening evaluation of the pore-gas VOC data. This screening evaluation compares maximum concentrations of VOCs in pore gas with pore-gas screening levels (SLs) derived from groundwater SLs. This conservative screening process evaluates the potential for the detected VOC concentrations to result in contamination of groundwater above applicable regulatory criteria.

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 policy.

### 1.1 Site Location and Description

MDA H is located in the east-central portion of the Laboratory at TA-54 (Figure 1.1-1) on Mesita del Buey. MDA H is a 70-ft-wide × 200-ft-long (0.3-acre) fenced area consisting of nine inactive vertical disposal shafts arranged in a line approximately 15 ft within, and parallel to, its southern fenceline (Figure 1.1-2). Each shaft is cylindrical, 6 ft in diameter, and 60 ft deep. The shafts are filled with solid-form waste to a depth of 6 ft below ground surface (bgs). The waste in Shafts 1 to 8 is covered by a 3-ft layer of concrete placed over 3 ft of crushed tuff. The waste in Shaft 9 is covered by 6 ft of concrete. The regional aquifer beneath MDA H is estimated to be at an average depth of approximately 1040 ft bgs based on data from nearby wells and the predictions of the hydrogeologic conceptual model for the Pajarito Plateau (LANL 1998, 059599).

## 2.0 SCOPE OF ACTIVITIES

The following activities were completed at MDA H during the third quarter of FY2011. Vapor-monitoring activities were conducted from June 8, 2011, to July 7, 2011. Table 2.0-1 outlines the NMED-approved vapor-monitoring locations, port depths, and corresponding sampling intervals.

- Samples were field screened and collected in accordance with the current version of Standard Operating Procedure 5074, Sampling Subsurface Vapor.
- Field screening was conducted using a MultiRAE IR Multi-Gas Monitor equipped with a photoionization detector (PID) to measure percent carbon dioxide (%CO<sub>2</sub>), percent oxygen (%O<sub>2</sub>), and VOC concentrations in parts per million.
- Vapor samples were submitted to off-site analytical laboratories in SUMMA canisters for VOC analysis using U.S. Environmental Protection Agency (EPA) Method TO-15 and in silica-gel columns for tritium analysis using EPA Method 906.
- A total of 28 ports in 4 vapor-monitoring wells were field screened for VOCs using the MultiRAE IR Multi-Gas Monitor PID.
- A total of 31 pore-gas samples (28 characterization and 3 quality assurance [QA]/quality control [QC]) were collected for VOC analysis from 28 ports in 4 vapor-monitoring wells.
- A total of 25 samples (19 characterization and 6 QA/QC) were collected for tritium analysis from 19 ports in 3 vapor-monitoring wells.

All analytical data were subject to QA/QC and data validation reviews in accordance with Laboratory guidance and procedures. Field duplicate samples were collected at a minimum frequency of 1 for every 10 samples. The QA/QC and data validation reviews for MDA H pore-gas data are presented in Appendix C.

No investigation-derived waste was generated at the time vapor-monitoring activities were conducted at MDA H.

Further discussion of the field methods used for pore-gas field screening and sample collection is presented in Appendix B. Field chain-of-custody forms and sample collection logs are provided in Attachment D-1 of Appendix D (on CD).

The pore-gas field-screening results are discussed in section 4, and the pore-gas analytical results are discussed in section 5. Any deviations from the scope of activities required in the June 23, 2009, letter to the Laboratory (NMED 2009, 106234) and the approved MDA H well installation work plan (LANL 2009, 106802; NMED 2009, 107653) are presented in the following section.

### 2.1 Deviations

No tritium samples were taken in vapor-monitoring well 54-15462, and no field blank samples were taken for VOCs during the third quarter of FY2011 because of impacts from the Las Conchas fire.

## 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 H. Because the primary pathway of concern for subsurface VOC vapors is migration to groundwater, an analysis was conducted to evaluate

the potential for contamination of groundwater by VOCs in pore gas using SLs based on groundwater SLs. The analysis evaluated the groundwater concentration that would be in equilibrium with the maximum pore-gas concentrations of VOCs detected at MDA H.

The equilibrium relationship between air (pore-gas) and water concentrations is described by the following equation:

$$C_{water} = C_{air} / H' \quad \text{Equation 3.0-1}$$

where  $C_{water}$  = the volumetric concentration of contaminant in water,  
 $C_{air}$  = the volumetric concentration of contaminant in air, and  
 $H'$  = the dimensionless form of Henry's law constant.

If the predicted concentration of a particular VOC in groundwater is less than the SL, then no potential exists for exceedances above applicable regulatory criteria at the vapor contaminant/groundwater interface.

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 is the NMED technical background document (NMED 2009, 108070) or the EPA regional screening tables ([http://www.epa.gov/region6/6pd/rcra\\_c/pd-n/screen.htm](http://www.epa.gov/region6/6pd/rcra_c/pd-n/screen.htm)). The following dimensionless form of Henry's law constant was used:

$$H' = \frac{C_{air}}{C_{water}} \quad \text{Equation 3.0-2}$$

Equation 3.0-2 can be used to calculate the screening value (SV):

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

where  $C_{air}$  is in units of  $\mu\text{g}/\text{m}^3$ ,  $SL$  is in units of  $\mu\text{g}/\text{L}$ , and 1000 is a conversion factor from L to  $\text{m}^3$ . 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 no MCL or NMWQCC standard is available, the NMED tap water SL should be used (NMED 2009, 108070). If no NMED tap water SL is available, the EPA regional tap water SL ([http://www.epa.gov/region6/6pd/rcra\\_c/pd-n/screen.htm](http://www.epa.gov/region6/6pd/rcra_c/pd-n/screen.htm)) is used. If EPA SLs for carcinogens are used, they should be adjusted to  $10^{-5}$  risk. 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 groundwater SL. Therefore, if the SV is less than 1, the concentration of the VOC in groundwater would 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 for the latest and previous three monitoring periods.

Results of the pore-gas screening evaluation are presented in section 5. No applicable standards for tritium in pore vapor are available, and the screening analysis described above does not apply to tritium.

#### **4.0 FIELD-SCREENING RESULTS**

Field screening for the third quarter of FY2011 was conducted using a MultiRAE IR Multi-Gas Monitor equipped with a PID to measure %CO<sub>2</sub>, %O<sub>2</sub>, and VOC concentrations in parts per million. Before each port was sampled, it was purged of stagnant air to ensure formation air was being collected. Each sampling port was then monitored until CO<sub>2</sub> and O<sub>2</sub> readings stabilized at levels representative of subsurface pore-gas conditions. Tables of all field-screening results obtained during the fourth quarter of FY2010 and the first, second, and third quarters of FY2011 sampling events at MDA H are provided in Appendix D and sorted by vapor-monitoring well ID and depth. The CO<sub>2</sub>, O<sub>2</sub>, and PID field-screening methods and results are discussed further in Appendix B. The CO<sub>2</sub> and O<sub>2</sub> results for the third quarter of FY2011 were within calibration limits.

#### **5.0 ANALYTICAL DATA RESULTS**

All vapor analytical sampling data presented in this report are available at the Risk Analysis, Communication, Evaluation, and Reduction (RACER) website (<http://www.racernm.com/>). Samples were submitted to off-site analytical laboratories in SUMMA canisters for VOC analysis using EPA Method TO-15 and in silica-gel columns for tritium analysis using EPA Method 906. The VOC pore-gas sampling results, VOC screening evaluation, and tritium sampling results are discussed below.

##### **5.1 VOC Results and Screening Evaluation**

VOC results from the third quarter of FY2011 and the previous three vapor-monitoring quarters are summarized in tables and provided in Appendix D. Plate 1 shows VOCs detected by vapor-monitoring well location during the third quarter FY2011 sampling event. Data associated with the previous three monitoring quarters (fourth quarter of FY2010 and first and second quarter of FY2011) are included for comparison purposes only.

A total of 17 VOCs were detected in MDA H pore gas during the third quarter of FY2011, and the results are similar to previous sampling results. Commonly detected VOCs include dichlorodifluoromethane; 1,1,1-trichloroethane; cyclohexane; and trichlorofluoromethane. All detected VOCs in MDA H pore gas were reported at low concentrations, and most detected VOC concentrations decreased with depth. Most VOC concentrations were reported as not detected.

The screening evaluation included the 17 detected VOCs in MDA H samples for which there are MCLs, NMWQCC standards, NMED tap water SLs or EPA regional tap water SLs (Table 3.0-1). Ethanol and n-heptane were detected but do not have MCLs, NMWQCC standards, or tap water SLs and were not evaluated.

The results of the VOC screening evaluation are presented in Table 5.1-1. The SVs were less than 1 for all detected VOCs during the third quarter of FY2011. In addition, SVs were less than 1 for detected VOCs during the previous three vapor-monitoring quarters.

##### **5.2 Tritium Results**

Tritium results from the third quarter of FY2011 and the previous three vapor-monitoring quarters are summarized in tables and provided in Appendix D. Figure 5.2-1 shows tritium detected during the latest sampling quarter by vapor-monitoring well location. Tritium was detected in 18 of 19 vapor samples taken. The highest tritium activities detected were in vapor-monitoring well 54-01023. Figure 5.2-2 shows vertical profiles for tritium collected during the third quarter of FY2011 and the previous three quarters for

each of the four vapor-monitoring wells. Tritium activities detected during the third quarter of FY2011 are generally similar to activities reported during previous sampling events. An increase in tritium activity was reported at 12 ft bgs in vapor-monitoring well 54-01023.

## 6.0 SUMMARY

The objectives of the MDA H vapor-monitoring activities are to (1) collect additional vapor samples from vapor-monitoring wells at MDA H and (2) compare sampling results with previously detected VOC concentrations and tritium activities in pore gas beneath and surrounding MDA H. The results of the most recent vapor-monitoring activities are similar to results reported during previous vapor-monitoring activities.

- A total of 17 VOCs were detected in the pore gas beneath MDA H. All detected VOCs in MDA H pore gas were reported at low concentrations, and most detected VOC concentrations decreased with depth. Most VOC concentrations were reported as not detected.
- The VOC screening evaluation identified no VOCs with SVs greater than 1 during the latest quarterly monitoring event. In addition, no SVs have exceeded 1 during the previous three monitoring quarters. No regulatory criteria exist for pore gas; therefore, the screening evaluation is a conservative comparison with groundwater SLs to help evaluate any potential for groundwater contamination by VOCs. Therefore, the low-concentration VOCs detected beneath MDA H do not have the potential to exceed groundwater SLs.
- Tritium was detected in the pore vapor beneath MDA H. Detected tritium activities generally decreased with depth. The results are generally similar to previous sampling results.

Vapor-monitoring activities are scheduled to continue at MDA H as directed by NMED's June 23, 2009, letter to the Laboratory (NMED 2009, 106234) and the approved MDA H well installation work plan (LANL 2009, 106802; NMED 2009, 107653), and results will be presented in subsequent quarterly monitoring reports.

## 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.*

LANL (Los Alamos National Laboratory), May 22, 1998. "Hydrogeologic Workplan," Los Alamos National Laboratory document LA-UR-01-6511, Los Alamos, New Mexico. (LANL 1998, 059599)

LANL (Los Alamos National Laboratory), August 2009. "Vapor-Monitoring Well Installation Work Plan for Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54," Los Alamos National Laboratory document LA-UR-09-5023, Los Alamos, New Mexico. (LANL 2009, 106802)

LANL (Los Alamos National Laboratory), November 2010. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Fourth Quarter Fiscal Year 2010," Los Alamos National Laboratory document LA-UR-10-7589, Los Alamos, New Mexico. (LANL 2010, 111360)

LANL (Los Alamos National Laboratory), March 2011. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, First Quarter Fiscal Year 2011," Los Alamos National Laboratory document LA-UR-11-1507, Los Alamos, New Mexico. (LANL 2011, 201569)

LANL (Los Alamos National Laboratory), May 2011. "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Second Quarter Fiscal Year 2011," Los Alamos National Laboratory document LA-UR-11-3004, Los Alamos, New Mexico. (LANL 2011, 203602)

NMED (New Mexico Environment Department), June 23, 2009. "Direction to Conduct Additional Investigations at Material Disposal Area H, SWMU 54-004, at Technical Area 54 to Define the Extent of Contamination," 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 2009, 106234)

NMED (New Mexico Environment Department), September 16, 2009. "Notice of Approval for the Vapor-Monitoring Well Installation Work Plan for Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54," 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 2009, 107653)

NMED (New Mexico Environment Department), December 2009. "Technical Background Document for Development of Soil Screening Levels, Revision 5.0," with revised Table A-1, New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2009, 108070)

## 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
LANL boundary	LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 13 August 2010.
TA boundary	Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 13 August 2010.
ER projects	ER Project Locations; Los Alamos National Laboratory, ESH&Q Waste and Environmental Services Division, 2010-2E; 1:2,500 Scale Data; 04 October 2010.

Legend Item/Type	Data Source
MDAs	Materials Disposal Areas; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; 23 April 2004.
Paved parking	Paved Parking; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Paved road	Paved Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Dirt road	Dirt Road Arcs; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Road centerlines	Road Centerlines; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 15 December 2005; as published 29 November 2010.
Structure	Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.
Contours	Hypsography, 10 and 100 Foot Contour Interval; 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 29 November 2010.
Drainage	Modeled Surface Drainage, 1991; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2002-0591; 1:24,000 Scale Data; Unknown publication date.





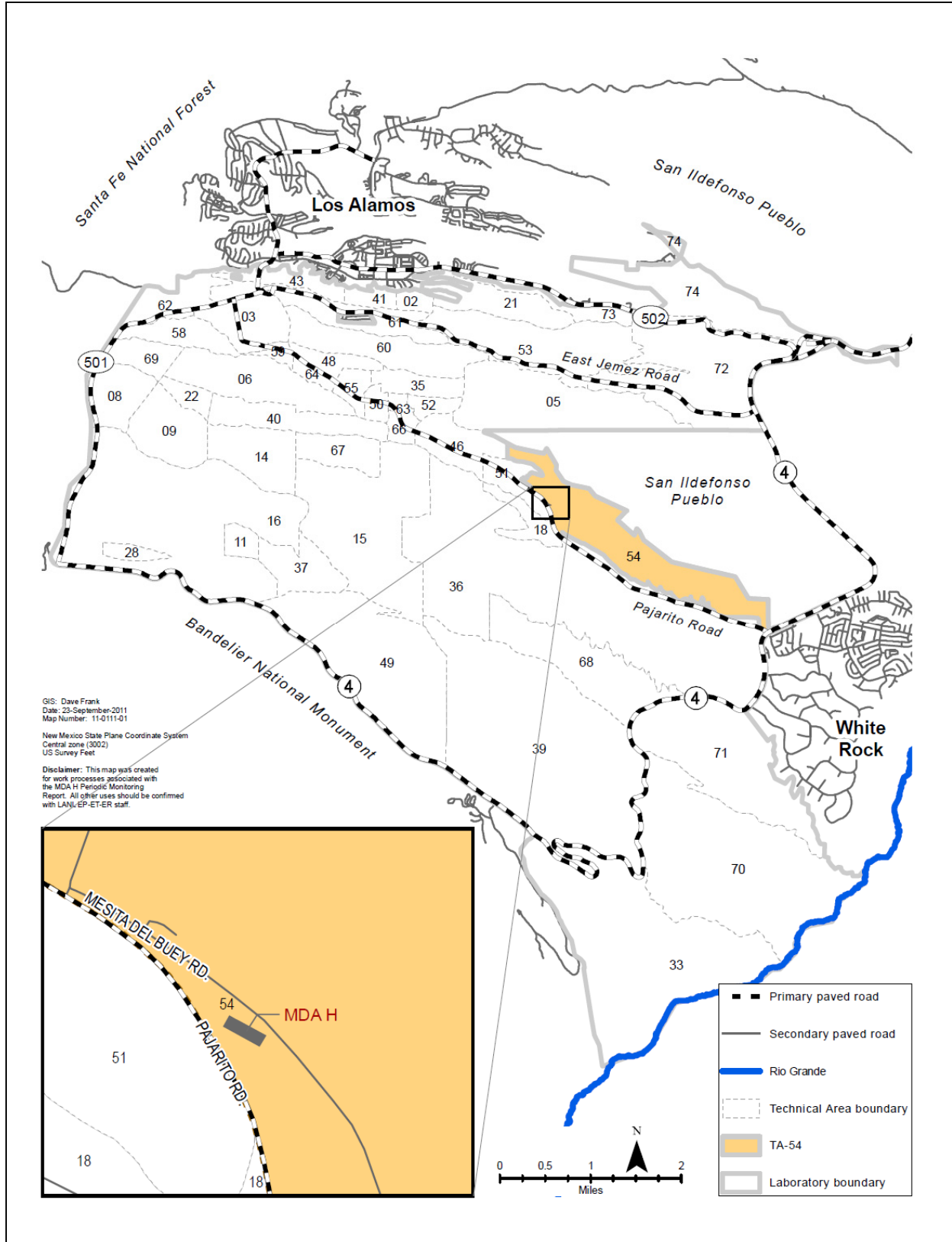


Figure 1.1-1 Location of MDA H in TA-54 with respect to Laboratory TAs and surrounding landholdings



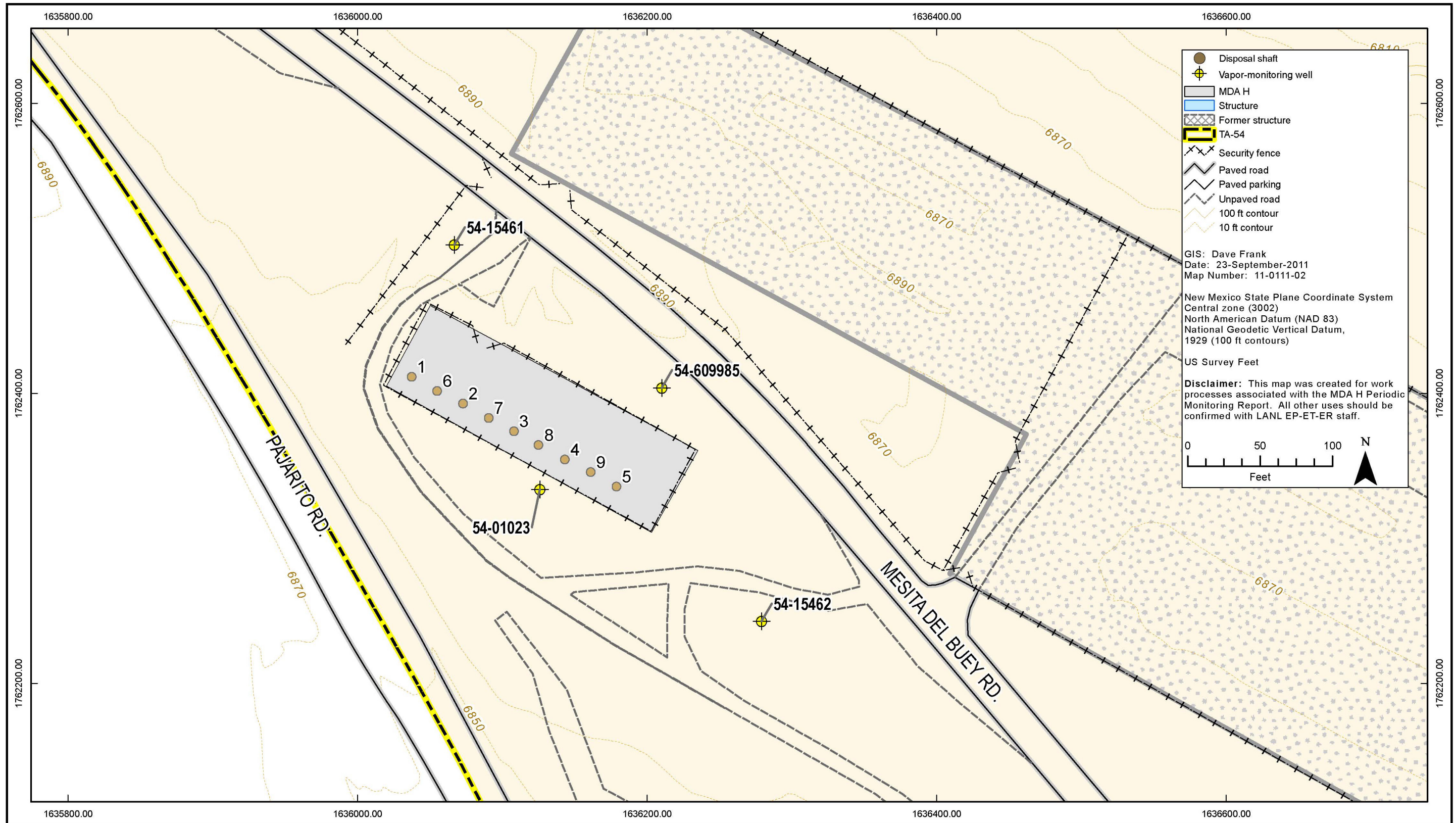


Figure 1.1-2 Locations of MDA H vapor-monitoring wells and associated structures and features



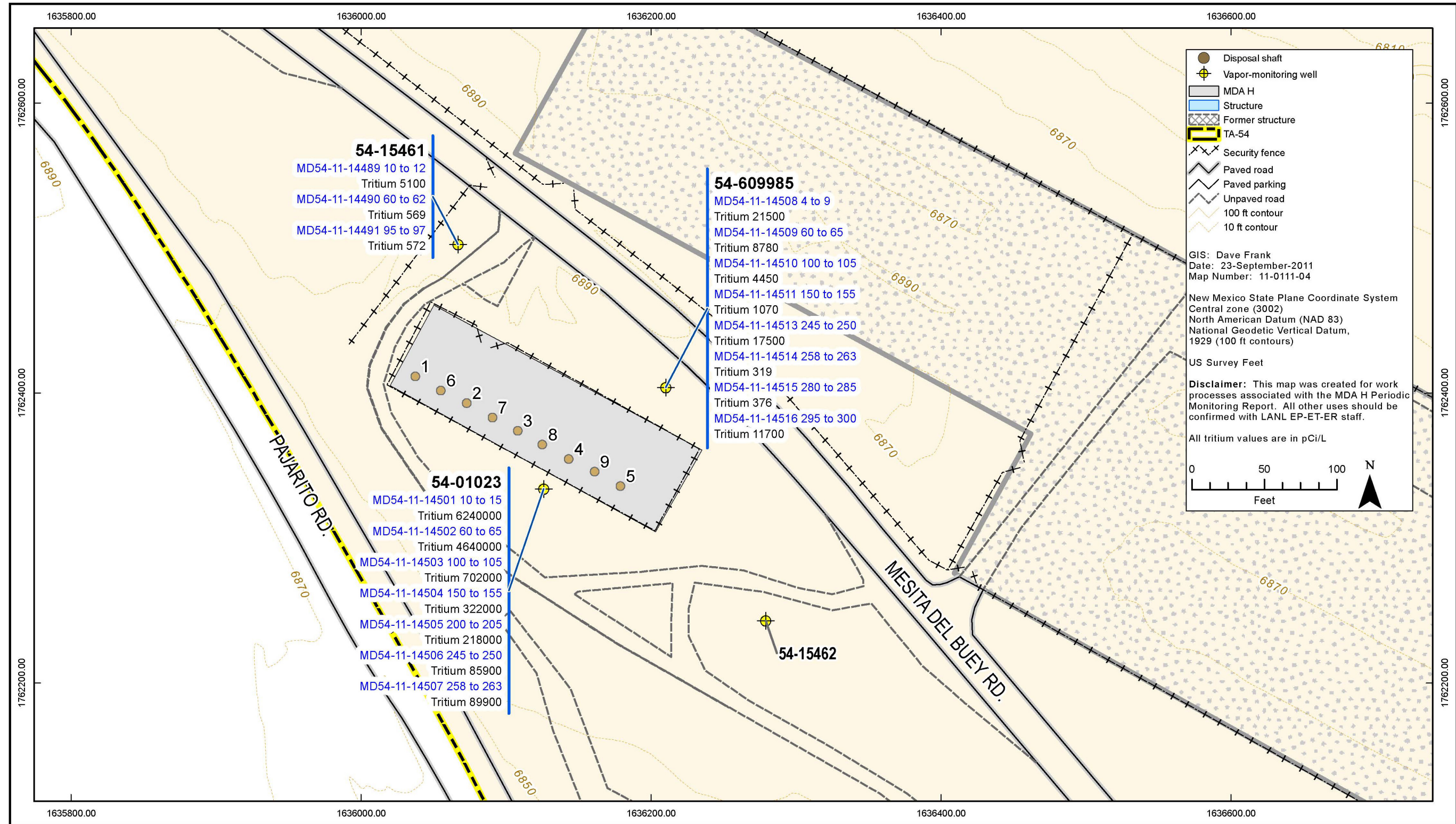


Figure 5.2-1 Tritium detected in vapor samples at MDA H

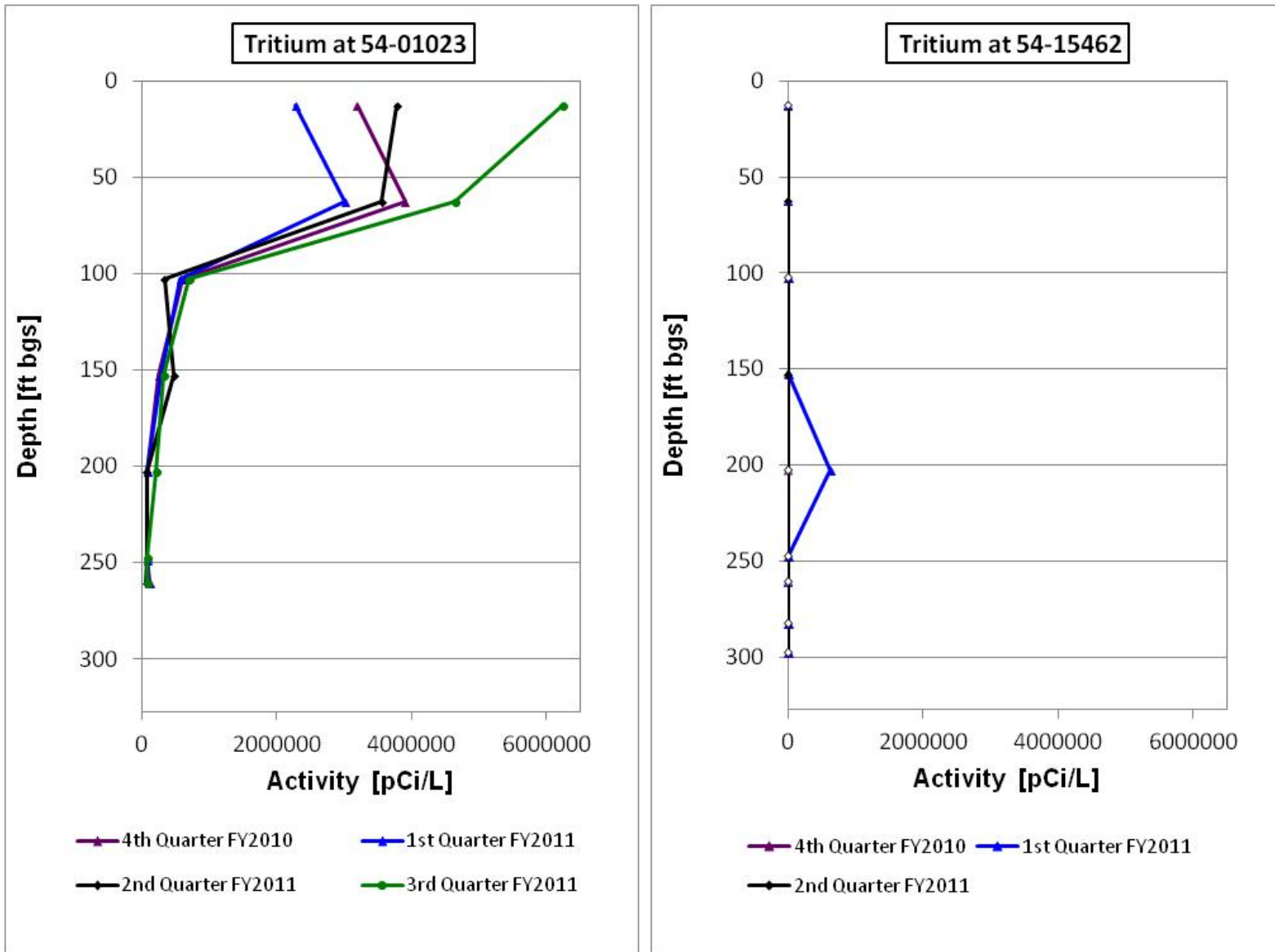


Figure 5.2-2 Vertical profiles of tritium in vapor-monitoring wells 54-01023, 54-15462, 54-15461, and 54-609985

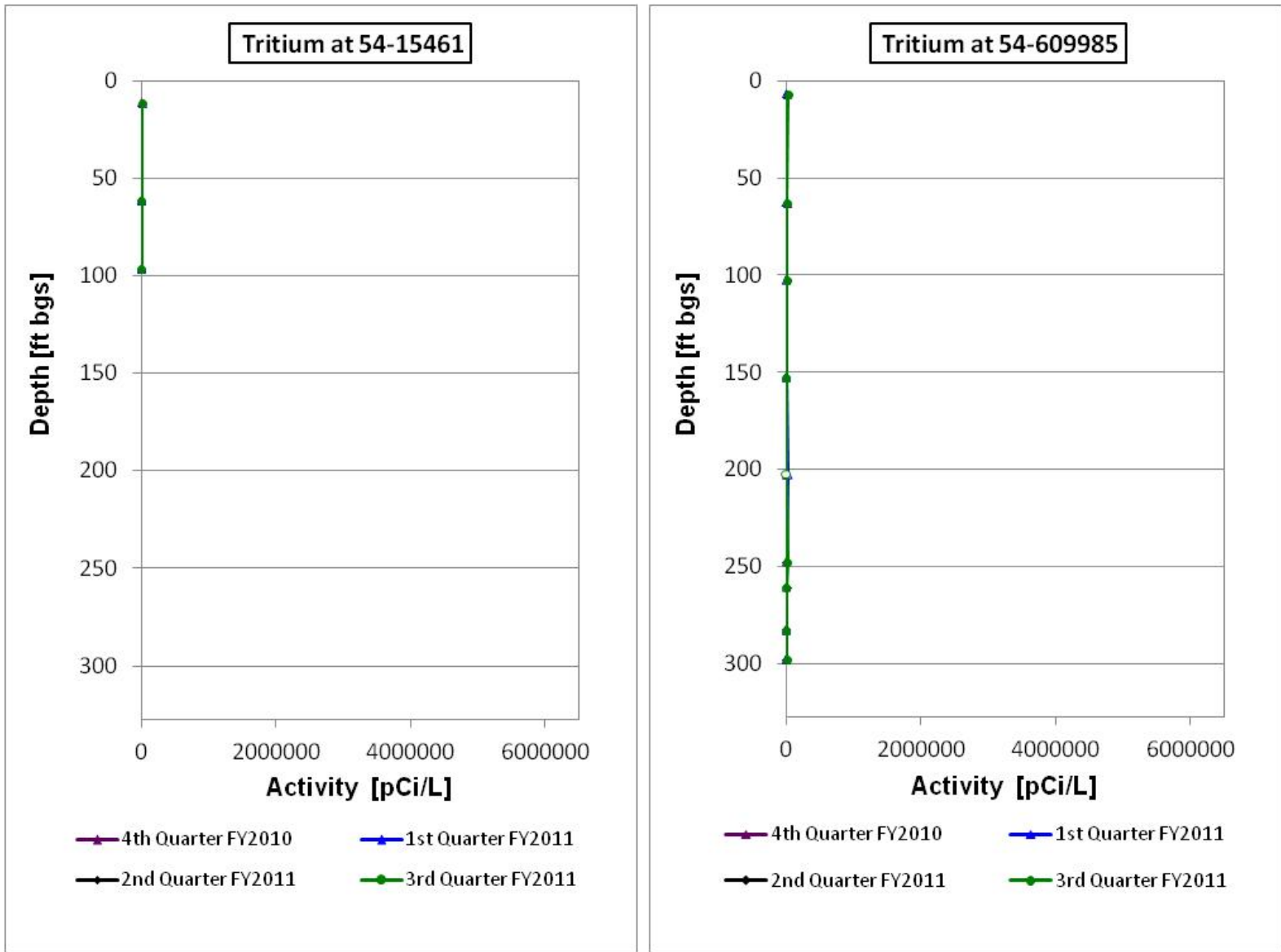


Figure 5.2-2 (continued) Vertical profiles of tritium in vapor-monitoring wells 54-01023, 54-15462, 54-15461, and 54-609985

**Table 2.0-1**  
**NMED-Approved MDA H Subsurface**  
**Vapor-Monitoring Locations, Port Depths, and Corresponding Sampling Intervals**

Vapor-Monitoring Well ID	VOC and Tritium Sampling Port Depths and Intervals (ft bgs)
54-01023	12.5 (10-15), 62.5 (60-65), 102.5 (100-105), 152.5 (150-155), 202.5 (200-205), 247.5 (245-250), 260.5 (258-263)
54-15461	11 (10-12), 61 (60-62), 96 (95-97)
54-15462	12.5 (10-15), 62.5 (60-65), 102.5 (100-105), 152.5 (150-155), 202.5 (200-205), 247.5 (245-250), 260.5 (258-263), 282.5 (280-285), 297.5 (295-300)
54-609985	6.5 (4-9), 62.5 (60-65), 102.5 (100-105), 152.5 (150-155), 202.5 (200-205), 247.5 (245-250), 260.5 (258-263), 282.5 (280-285), 297.5 (295-300)

Note: All ports require field screening as well as VOC and tritium sampling.

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

VOC	Henry's Law Constant <sup>a</sup> (dimensionless)	Groundwater Screening Level (µg/L)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard <sup>b</sup> (µg/m <sup>3</sup> )
Acetone	0.0016	21,800 <sup>a</sup>	34,900
Benzene	0.228	5 <sup>c</sup>	1140
Carbon Disulfide	0.59	1040 <sup>a</sup>	615,000
Carbon Tetrachloride	1.1	5 <sup>c</sup>	5500
Chlorodifluoromethane	1.7	104,000 <sup>a</sup>	177,000,000
Chloroform	0.15	80 <sup>c</sup>	15,000
Cyclohexane	6.1 <sup>d</sup>	13,000 <sup>d</sup>	79,300,000
Dichlorodifluoromethane	14	395 <sup>a</sup>	5,520,000
Dichloropropane[1,2-]	0.12	5 <sup>c</sup>	600
Ethanol	na <sup>e</sup>	na	na
Hexane	74	876 <sup>a</sup>	64,800,000
Methylene Chloride	0.13	5 <sup>c</sup>	650
n-Heptane	na	na	na
Tetrachloroethene	0.72	5 <sup>c</sup>	3600
Toluene	0.272	750 <sup>f</sup>	204,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	22	59,200 <sup>a</sup>	1,300,000,000
Trichloroethane[1,1,1-]	0.705	60 <sup>f</sup>	42,300
Trichloroethene	0.4	5 <sup>c</sup>	2000
Trichlorofluoromethane	4	1290 <sup>a</sup>	5,150,000



Table 3.0-1 (continued)

VOC	Henry's Law Constant <sup>a</sup> (dimensionless)	Groundwater Screening Level (µg/L)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard <sup>b</sup> (µg/m <sup>3</sup> )
Trimethylbenzene[1,2,4-]	0.25 <sup>d</sup>	15 <sup>d</sup>	3750
Xylene[1,3-]+Xylene[1,4-]	0.28	620 <sup>f</sup>	174,000

<sup>a</sup> Henry's law constants and SLs from NMED (2009, 108070) unless otherwise noted.

<sup>b</sup> Derived from denominator of Equation 3.0-3.

<sup>c</sup> EPA MCL (40 Code of Federal Regulations 141.61).

<sup>d</sup> Henry's law constants and SLs from EPA regional screening tables ([http://www.epa.gov/region06/6pd/rcra\\_c/pd-n/screen.htm](http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm)). Adjusted to 10<sup>-5</sup> risk for carcinogens.

<sup>e</sup> na = Not available.

<sup>f</sup> NMWQCC groundwater standard (20.6.2.3103 New Mexico Administrative Code).

**Table 5.1-1**  
**Screening of VOCs in Pore Gas at MDA H, Third Quarter of FY2011**

VOC	Maximum Pore-Gas Concentration (µg/m <sup>3</sup> )	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard <sup>a</sup> (µg/m <sup>3</sup> )	SV <sup>b</sup> (unitless)
Acetone	29	34,853	0.000832
Carbon Tetrachloride	11	5500	0.002
Chlorodifluoromethane	16	177,285,714	9.02E-08
Chloroform	49	15,000	0.00327
Cyclohexane	110	79,300,000	0.00000139
Dichlorodifluoromethane	61	5,524,324	0.000011
Dichloropropane[1,2-]	7	600	0.0112
Ethanol	14	na <sup>c</sup>	na
Methylene Chloride	5	650	0.00754
n-Heptane	13	na	na
Tetrachloroethene	28	3600	0.00778
Toluene	14	204,000	0.0000686
Trichloro-1,2,2-trifluoroethane[1,1,2-]	29	1,302,162,162	2.23E-08
Trichloroethane[1,1,1-]	120	42,300	0.00284
Trichloroethene	11	2000	0.0055
Trichlorofluoromethane	57	5,152,941	0.0000111
Xylene[1,3-]+Xylene[1,4-]	4.4	174,000	0.0000253

<sup>a</sup> Derived from denominator of Equation 3.0-3.

<sup>b</sup> 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.

<sup>c</sup> na = Not available.



# **Appendix A**

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



**A-1.0 ACRONYMS AND ABBREVIATIONS**

ADEP	Environmental Programs Directorate
bgs	below ground surface
COC	chain of custody
DER	duplicate error ratio
EPA	Environmental Protection Agency (U.S.)
FY	fiscal year
LANL	Los Alamos National Laboratory
LCS	laboratory control sample
MCL	maximum contaminant level
MDA	material disposal area
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
PID	photoionization detector
PMR	periodic monitoring report
QA	quality assurance
QC	quality control
RACER	Risk Analysis, Communication, Evaluation, and Reduction
RPD	relative percent difference
RPF	Records Processing Facility
SCL	sample collection log
SL	screening level
SMO	Sample Management Office
SOP	standard operating procedure
SV	screening value
TA	technical area
TPU	total propagated uncertainty
VOC	volatile organic compound

**A-2.0 METRIC CONVERSION TABLE**

<b>Multiply SI (Metric) Unit</b>	<b>by</b>	<b>To Obtain U.S. Customary Unit</b>
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 ( $\mu\text{m}$ )	0.0000394	inches (in.)
square kilometers ( $\text{km}^2$ )	0.3861	square miles ( $\text{mi}^2$ )
hectares (ha)	2.5	acres
square meters ( $\text{m}^2$ )	10.764	square feet ( $\text{ft}^2$ )
cubic meters ( $\text{m}^3$ )	35.31	cubic feet ( $\text{ft}^3$ )
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter ( $\text{g}/\text{cm}^3$ )	62.422	pounds per cubic foot ( $\text{lb}/\text{ft}^3$ )
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram ( $\mu\text{g}/\text{g}$ )	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius ( $^{\circ}\text{C}$ )	$9/5 + 32$	degrees Fahrenheit ( $^{\circ}\text{F}$ )

**A-3.0 DATA QUALIFIER DEFINITIONS**

<b>Data Qualifier</b>	<b>Definition</b>
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**

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*Field Methods*



## **B-1.0 INTRODUCTION**

This appendix summarizes the field methods used during the third quarter of fiscal year (FY) 2011 sampling activities at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54, at Los Alamos National Laboratory (LANL or the Laboratory). All activities were conducted in accordance with the applicable standard operating procedures (SOPs), quality procedures, and Laboratory implementation and 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 according to site-specific health and safety documents and an integrated work document. The field activities conducted according to SOPs are discussed below.

### **B-2.1 Pore-Gas Field Screening**

All samples were field screened in accordance with the current version of SOP-5074, Sampling Subsurface Vapor. This procedure covers the use of the Brüel and Kjær Type 1302 multigas analyzer and the MultiRAE IR Multi-Gas Monitor. All field-screening results were recorded on the appropriate sample collection logs (SCLs) and/or in the field logbook and are provided in Attachment D-1 of Appendix D (on CD).

#### **B-2.1.1 MultiRAE IR Multi-Gas Monitor**

Before each sampling event, each sampling port was purged of stagnant air and then monitored with a MultiRAE IR Multi-Gas Monitor until the percent carbon dioxide (%CO<sub>2</sub>) and percent oxygen (%O<sub>2</sub>) levels stabilized at values representative of subsurface pore-gas conditions. In addition, volatile organic compound (VOC) concentrations were estimated in parts per million using the MultiRAE IR Multi-Gas Monitor equipped with an 11.7-electron volt lamp photoionization detector (PID). Each rented instrument was shipped factory-calibrated to the subcontractor, and the calibration was checked daily.

The MultiRAE IR Multi-Gas Monitor can also be calibrated using a two-point process using “fresh air” and a standard gas. The first point calibration is the fresh air calibration that determines the zero point of the calibration curve for lower explosive limit, VOC, and toxic gas sensors. The fresh air calibration uses air containing a 20.9% oxygen concentration and is void of toxic gases and other impurities. The standard gas calibration sets the second point of the sensor calibration curve. The CO, CO<sub>2</sub>, and O<sub>2</sub> sensors are zeroed during this two-point calibration process.

Calibration information is reported below for the MultiRAE IR Multi-Gas Monitor used to generate results presented in this periodic monitoring report.

- Unit 2375 was calibrated on April 6, 2011, at Geotech Environmental Equipment, Inc., in Denver, Colorado. The zero points were set for CO<sub>2</sub> and O<sub>2</sub>. Percent oxygen was set to read ambient air at 20.9%.

Oxygen values should be near the zero point for O<sub>2</sub>. The CO<sub>2</sub> reading should be near zero. Readings deviating from the zero points for O<sub>2</sub> and CO<sub>2</sub> may be because of subsurface conditions or a need for calibration.

The vapor-sample tubing was purged of stagnant air by drawing sufficient air from the sampling interval through the line. To ensure that the sample collected was representative of the subsurface air at depth, every sampling activity included a purge cycle.

The %CO<sub>2</sub> and %O<sub>2</sub> screening levels are presented in Appendix D. The third quarter of FY2011 %CO<sub>2</sub> and %O<sub>2</sub> levels ranged from 0% to 1.2% and from 19.8% to 20.9%, respectively. These values are within acceptable limits and are representative of subsurface pore-gas conditions.

VOC screening data using a PID are presented in Appendix D. The VOC concentrations using the PID remained at 0 ppm during the third quarter of FY2011.

### **B-2.2 VOC Pore-Gas Sample Collection**

All VOC samples were collected in accordance with the current version of SOP-5074, Sampling Subsurface Vapor.

Upon completion of purging and field screening, VOC samples were taken using a sample train setup along with a SUMMA canister. Information was recorded on the appropriate SCLs. Field chain-of-custody (COC) forms and SCLs are provided in Attachment D-1 of Appendix D (on CD).

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

### **B-2.3 Tritium Pore-Gas Sample Collection**

All tritium samples were collected in accordance with the current version of SOP-5074 and were submitted to the SMO for processing and transport to off-site contract analytical laboratories. Water vapor intended for tritium analysis was collected from pore gas by pulling a pore-gas sample through a canister of silica gel (silica-gel column), and the sample information was recorded on the appropriate SCL in Attachment D-1 of Appendix D (on CD). Silica gel was the medium used at the Laboratory to collect moisture from pore-gas samples. The moisture was analyzed for tritium using liquid scintillation counting. Silica-gel column field duplicate 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.

Silica gel was prepared for sampling by drying it at a temperature above 100°C. Drying removes moisture from the silica gel but does not remove bound water that is accounted for by measuring the bound water percentage in each batch of silica gel. Before sample collection, the amount of silica gel used in each sample was weighed (typically about 135 g). The sample canister with silica gel was also weighed before sampling. SOP-5074 requires that at least 5 g of moisture be collected. After sampling, the sample canister with silica gel was weighed again to verify that 5 g of water vapor had been collected.

The sample (canister plus silica gel) was shipped to the analytical laboratory where it 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 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 activity 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 involve standard sampling equipment, personal protective equipment, waste management, and site-control equipment/materials. The procedure covers pre-mobilization 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 quality assurance. Specific requirements were met for each sample and were printed in the SCLs 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 for shipping of 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 Quality Control Samples	Field quality control samples were collected as follows:  Field duplicates were collected at a frequency of 10% and at the same time as a regular sample and submitted for the same analyses.  Field blanks 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 Subsurface Vapor	Vapor sampling was performed at four monitoring wells in accordance with the current version of SOP-5074, and samples were analyzed for VOCs and tritium. This SOP describes the process of sampling subsurface air from vapor ports in monitoring wells and boreholes. The 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 a 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 H Pore-Gas Monitoring Activities**

<b>Document Number</b>	<b>LANL Procedure Title</b>
SOP-5055	General Instructions for Field Investigations
SOP-5056	Sample Containers and Preservation
SOP-5057	Handling, Packaging, and Transporting Field Samples
WES-EDA-QP-219	Sample Control and Field Documentation
SOP-5059	Field Quality Control Samples
SOP-5061	Field Decontamination of Equipment
SOP-5074	Sampling Subsurface Vapor
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 and Logbook Documentation for Environmental Directorate Technical and Field Activities
SOP-5228	ADEP* Reporting Requirements for Abnormal Events
SOP-5269	Chain-of-Custody for Analytical Data Record Packages

\*ADEP = Environmental Programs Directorate.

# **Appendix C**

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*Quality Assurance/Quality Control Program*



## **C-1.0 INTRODUCTION**

This appendix presents the analytical methods and summarizes the data quality review for the third quarter of fiscal year (FY) 2011 pore-gas samples collected at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54, 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 Laboratory's "Quality Assurance Project Plan Requirements for Sampling and Analysis" (LANL 1996, 054609) and the Laboratory's scope of work for analytical services (LANL 2008, 109962). 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, blank spikes, matrix spikes, laboratory control samples (LCSs), internal standards, initial and continuing calibrations, and surrogates, were used to assess laboratory accuracy and bias.

The type and frequency of QC analyses are described in the analytical services scope of work (LANL 2008, 109962). Other QC factors, such as sample preservation and holding times, were also assessed. The requirements for sample preservation and holding times are presented in 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. 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 Attachment D-1 of Appendix D (on CD).

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines for organic and inorganic chemical data review where applicable (EPA 1994, 048639; EPA 1999, 066649). Data have also been assessed using guidelines established in Method 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-1.1 Maintenance of Chain of Custody**

To maintain chain of custody is to document or demonstrate the possession of an item by only authorized individuals. The chain-of-custody process, described in SOP-5269, Chain of Custody for Analytical Data Record Packages, provides confidence in, and documentation of, analytical data integrity by establishing the traceability of the sample from the time of collection through processing to final maintenance as a record. The chain-of-custody forms are provided in Attachment D-1 of Appendix D (on CD).

### **C-1.2 Sample Documentation**

Establishing sample documentation acceptability, as described in WES-EDA-QP-219, Sample Control and Field Documentation, is the first step toward verifying that an analytical system has produced data of known quality. Documentation depends on the accessibility of review items that accurately and completely describe the work performed. In the absence of adequate sample documentation, data quality cannot be independently verified.

### **C-1.3 Sample Preservation**

Sample preservation is the use of specific types of sample containers and preservation techniques, as described in SOP-5056. Sample preservation is mandatory for hazardous site investigations because the integrity of any sample decreases over time. Physical factors (e.g., light, pressure, or temperature), chemical factors (e.g., changes in pH or volatilization), and biological factors may alter the original quality of a sample. Because the various target parameters are uniquely altered at varying rates, distinct sample containers, preservation techniques, and holding times have been established to maintain sample integrity for a reasonable and acceptable period of time.

### **C-1.4 Holding Time**

Holding time, the maximum amount of time a sample can be stored without potential unacceptable changes in analyte concentrations, is described in SOP-5056. Extraction holding time refers to the time that elapses between sample collection and sample preparation; analytical holding time refers to the time that elapses between sample preparation and analysis.

### **C-1.5 Initial and Continuing Calibration Verification (Including Interference-Check Standards)**

Calibration verification establishes a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. There are two aspects of calibration verification: initial and continuing. The initial calibration verifies the accuracy of the calibration curve and the individual calibration standards being used to perform the calibration. The continuing calibration ensures that the initial calibration is still holding and correct as the instrument is used to process samples. Interference-check samples are used to determine if a high concentration of a single analyte in a sample interferes with the accurate quantitation of other analytes.

### **C-1.6 Analyte Identification (Including Spectra Review and Thermal Ionization Cavity Review)**

Analyte identification is the process of associating an instrument signal with a compound or analyte of interest. Evaluation of signal retention times, spectral overlap, multiplex pattern matching, and mass spectral library searches are tools for making analyte identification determinations.

### **C-1.7 Analyte Quantitation**

Analyte quantitation is the association of an instrument signal with a concentration and the determination that a recorded signal is detected or not detected. Detection limits, instrument calibration linear ranges, internal standards, and carrier recoveries are tools for making analyte quantitation evaluations.

Organic chemical results are not detected if reported results are less than or equal to the method detection limit adjusted by sample-specific dilution or concentration factors.

Tritium results reported at less than the minimum detectable concentration are not detected. Each tritium result is also compared with the corresponding 1-sigma total propagated uncertainty (TPU). If the result is not greater than 3 times the TPU, it is also qualified as not detected (U).

### **C-1.8 Method Blank**

A method blank is an analyte-free matrix to which all 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. All target analytes should be below the contract-required detection limit in the method blank (LANL 2008, 109962).

### **C-1.9 Matrix Spike Recoveries**

A matrix spike is an aliquot of a sample spiked with a known concentration of the target analyte(s). Matrix spike samples are used to measure the ability to recover prescribed analytes from a native sample matrix. Spiking typically occurs before sample preparation and analysis. Acceptable percentage recoveries for matrix spikes vary by method but should generally be greater than 10% for an analytical result to be usable (LANL 2008, 109962).

### **C-1.10 Surrogate**

Surrogates (an organic chemical compound) are similar in composition and behavior to target analytes but are not typically found in environmental samples. Surrogates are added to every blank, sample, and spike to evaluate the efficiency with which target analytes are recovered during extraction and analysis. The recovery percentages of the surrogates vary by method but should generally be greater than 10% for an analytical result to be usable (LANL 2008, 109962).

### **C-1.11 Internal Standard Responses and Carrier Recoveries**

Internal standards are chemical compounds added to blank, sample, and standard extracts at known concentrations. They are used to compensate for (1) analyte concentration changes that might occur during storage of the extract and (2) quantitation variations that can occur during analysis. Internal standard responses are used to adjust the reported concentrations for the quantitation of target analytes. The response factors for internal standards vary by method but should generally be within the range of  $\geq 50\%$  to  $\leq 200\%$  (LANL 2008, 109962).

### **C-1.12 LCS Recoveries**

An LCS is a known matrix that has been spiked with compound(s) representative of the target analytes. The LCS is used to document laboratory performance. The acceptance criteria for LCSs are method-specific but should generally be greater than 10% for an analytical result to be usable (LANL 2008, 109962).

### **C-1.13 Laboratory and Field Duplicates (Including Serial Dilutions)**

Laboratory duplicates are two portions of a sample taken from the same sample container (prepared for analysis and analyzed independently but under identical conditions) that are used to assess or demonstrate acceptable laboratory-method precision at the time of analysis. For radionuclide laboratory duplicates, the duplicate error ratio (DER) is also used to quantify precision. The DER is defined by the equation  $DER = |S - D|/\sqrt{[(2\sigma_S)^2 + (2\sigma_D)^2]}$ , where S represents the original sample value, D represents the duplicate value, and  $2\sigma_S$  and  $2\sigma_D$  represent the 2-sigma uncertainties surrounding the original and duplicate samples, respectively. A DER below 3 indicates sample-to-field duplicate precision that is in control.

Field duplicates are samples taken as close as possible to the same time and from the same location. They are analyzed as two separate samples at the laboratory. Each duplicate sample is equally representative of the original material. All relative percent differences (RPDs) between samples and field duplicates should be  $\pm 35\%$  (LANL 2008, 109962). The RPD is defined by the equation  $RPD = [|D1 - D2|/(D1 + D2)/2] \times 100\%$ , where D1 and D2 represent analytical measurements on

duplicate samples. Field duplicates are collected for both volatile organic compound (VOC) and radionuclide analytes.

The field duplicate 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.

#### **C-1.14 Field Blanks, Equipment Blanks, and Performance Evaluations**

A field blank is a sample of analyte-free medium taken to the sampling site and exposed to the atmosphere during sample-collection activities. Field blanks are used to measure contamination introduced during sample collection. The field blank 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.

An equipment blank is a sample used to verify cleanliness of the sampling equipment. It is collected after completion of decontamination and before sampling.

A performance evaluation is a sample of the field-screening instrument (Brüel and Kjær) operational check gas. The operational check gas consists of known quantities of mixed organic analytes in nitrogen.

#### **C-2.0 LABORATORY ANALYSIS SUMMARY**

During the third quarter of FY2011, 28 VOC pore-gas samples, 0 field blank samples, and 3 field duplicate samples were collected at MDA H. Additionally, 19 tritium samples, 3 field blank samples, and 3 field duplicate samples were collected. Analysis of pore gas was conducted for VOCs using EPA Method TO-15, and analysis for tritium was conducted using EPA Method 906.0. Table C-2.0-1 lists the analytical methods used for VOC and tritium analyses. All QC procedures were followed, as required by the analytical services scope of work (LANL 2008, 109962).

Sampling locations, sampling ports, and validated analytical results for VOCs and tritium are presented in Appendix D of this periodic monitoring report. The entire data set meets the standards for use in this report.

The tritium and VOC analyses are summarized in the following sections. The required minimum detectable concentration or estimated quantitation limit is prescribed in the analytical services scope of work (LANL 2008, 109962).

#### **C-3.0 ORGANIC CHEMICAL ANALYSES**

No VOC data were rejected during the third quarter of FY2011. Chain of custody, field documentation, and holding times were properly maintained for all samples. No sample preservation is required for VOCs. Analyte identification criteria were met for all VOC results. Method blanks, surrogate recoveries, and internal standards responses were all within acceptable limits. The data qualifiers are defined in Appendix A.

One VOC was qualified as J because the result was less than the practical quantitation limit but greater than the MDL.



A total of 17 VOCs were qualified as UJ because the affected analytes were analyzed with an initial calibration curve that exceeded the percent relative standard deviation criteria, and/or the associated multipoint calibration correlation coefficient is less than 0.995.

A total of 48 results were qualified as UJ because the initial calibration verification and/or continuous calibration verification were recovered outside the method-specific limits.

A total of three field duplicates and their associated sample had RPDs >35%. Table C-3.0-1 summarizes samples containing RPDs >35%.

#### **C-4.0 RADIONUCLIDE ANALYSES**

No tritium results were rejected during the third quarter of FY2011. Chain of custody, field documentation, and holding times were properly maintained for all samples. No sample preservation is required for tritium. The LCS recoveries were within acceptable limits for all tritium analyses.

One tritium sample was qualified as U because the associated sample concentration was less than or equal to the minimum detectable concentration.

One field duplicate and its associated sample had an RPD >35%. Table C-4.0-1 summarizes the sample containing an RPD >35%.

A total of two field blanks had detectable levels of tritium. The maximum activity detected in a field blank was 792.45 pCi/L in vapor-monitoring well 54-01023.

#### **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)

EPA (U.S. Environmental Protection Agency), 1997. "Test Methods for Evaluating Solid Waste, Laboratory Manual, Physical/Chemical Methods," SW-846, 3rd ed., Update III, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1997, 057589)

EPA (U.S. Environmental Protection Agency), October 1999. "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," EPA540/R-99/008, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1999, 066649)

LANL (Los Alamos National Laboratory), March 1996. "Quality Assurance Project Plan Requirements for Sampling and Analysis," Los Alamos National Laboratory document LA-UR-96-441, Los Alamos, New Mexico. (LANL 1996, 054609)

LANL (Los Alamos National Laboratory), June 30, 2008. "Exhibit 'D' Scope of Work and Technical Specifications, Analytical Laboratory Services for General Inorganic, Organic, Radiochemical, Asbestos, Low-Level Tritium, Particle Analysis, Bioassay, Dissolved Organic Carbon Fractionation, and PCB Congeners," Los Alamos National Laboratory document RFP No. 63639-RFP-08, Los Alamos, New Mexico. (LANL 2008, 109962)

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

Procedure	Title	Effective Date
SOP-5161, R0	Routine Validation of Volatile Organic Compound (VOC) Analytical Data	6/10/2008
SOP-5166, R0	Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data	6/30/2008

**Table C-2.0-1  
Analytical Methods Used for Sample Analyses**

Analytical Method	Analytical Description	Target Compound List
EPA Method TO-15	VOCs in pore gas	See analytical services scope of work (LANL 2008, 109962)
EPA Method 906.0	Tritium in pore gas	Tritium

**Table C-3.0-1  
VOC Sample Record with Field Duplicate Relative Percent Difference above 35%**

Vapor-Monitoring Well ID	Depth (ft)	Analyte	Sample Standard Result ( $\mu\text{g}/\text{m}^3$ )	Field Duplicate Result ( $\mu\text{g}/\text{m}^3$ )	RPD (%)
54-01023	102.5	Tetrachloroethene	27	13	70.0
54-01023	102.5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	8.8	13	38.5
54-15461	61	Tetrachloroethene	21	8.5	84.7

**Table C-4.0-1  
Tritium Sample Record with Field Duplicate Relative Percent Difference above 35%**

Vapor-Monitoring Well ID	Depth (ft)	Sample Standard Result (pCi/L)	Field Duplicate Result (pCi/L)	RPD (%)
54-609985	247.5	17,452	11,211	43.5



## **Appendix D**

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*Field-Screening Results and  
Detected Volatile Organic Compounds and Tritium*



## **D-1.0 INTRODUCTION**

This appendix summarizes the field-screening results as well as detected volatile organic compound (VOC) concentrations and tritium activities for the third quarter of fiscal year (FY) 2011 at Material Disposal Area (MDA) H. The tables listed below are included in this appendix and are organized by vapor-monitoring well ID and depth.

- Table D-1.0-1, Field-Screening Results Using a MultiRAE IR Multi-Gas Monitor at MDA H
- Table D-1.0-2, Summary of VOCs Detected in Pore-Gas Samples at MDA H, in  $\mu\text{g}/\text{m}^3$
- Table D-1.0-3, Summary of VOCs Detected in Pore-Gas Samples at MDA H, in ppbv
- Table D-1.0-4, Summary of Tritium Results at MDA H

Data qualifiers used in these tables are defined in Appendix A of this periodic monitoring report.

Attachment D-1 (on CD included with this document) presents the analytical suites and results and analytical reports for the current and previous three monitoring periods.





**Table D-1.0-1  
Field-Screening Results Using a MultiRAE IR Multi-Gas Monitor at MDA H**

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010 <sup>b</sup>		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023	Ambient	Ambient	CO <sub>2</sub> (%)	07/23/10	0	11/04/10	0.038	01/18/11	0.05	06/08/11	0.0
			O <sub>2</sub> (%)	07/23/10	19.5	11/04/10	20.9	01/18/11	20.9	06/08/11	20.9
			PID <sup>c</sup> (ppm)	NS <sup>d</sup>	NS	11/10/10	NS	01/18/11	0.0	06/08/11	0.0
	10	15	CO <sub>2</sub> (%)	07/23/10	0.6	11/04/10	0.65	01/18/11	0.29	06/08/11	0.71
			O <sub>2</sub> (%)	07/23/10	19.1	11/04/10	20.3	01/18/11	20.9	06/08/11	20.2
			PID (ppm)	NS	NS	11/10/10	0.3	01/18/11	0.0	06/08/11	0.0
	60	65	CO <sub>2</sub> (%)	07/23/10	0.7	11/04/10	0.73	01/18/11	0.60	06/08/11	1.0
			O <sub>2</sub> (%)	07/23/10	18.7	11/04/10	20.1	01/18/11	20.1	06/08/11	19.8
			PID (ppm)	NS	NS	11/10/10	0.2	01/18/11	0.0	06/08/11	0.0
	100	105	CO <sub>2</sub> (%)	07/23/10	0.6	11/04/10	0.65	01/18/11	0.53	06/08/11	0.87
			O <sub>2</sub> (%)	07/23/10	18.7	11/04/10	20.1	01/18/11	20.2	06/08/11	20.0
			PID (ppm)	NS	NS	11/10/10	0.1	01/18/11	0.0	06/08/11	0.0
	150	155	CO <sub>2</sub> (%)	07/23/10	0.5	11/04/10	0.45	01/18/11	0.46	06/08/11	0.62
			O <sub>2</sub> (%)	07/23/10	18.8	11/04/10	20.3	01/18/11	20.3	06/08/11	19.9
			PID (ppm)	NS	NS	11/10/10	0.1	01/18/11	0.0	06/08/11	0.0
	200	205	CO <sub>2</sub> (%)	07/23/10	0.4	11/04/10	0.42	01/18/11	0.38	06/08/11	0.50
			O <sub>2</sub> (%)	07/23/10	18.8	11/04/10	20.4	01/18/11	20.4	06/08/11	19.9
			PID (ppm)	NS	NS	11/10/10	0.1	01/18/11	0.0	06/08/11	0.0
	245	250	CO <sub>2</sub> (%)	07/23/10	0.4	11/04/10	0.38	01/18/11	0.35	06/08/11	0.41
			O <sub>2</sub> (%)	07/23/10	19	11/04/10	20.4	01/18/11	20.4	06/08/11	19.9
			PID (ppm)	NS	NS	11/10/10	0.2	01/18/11	0.0	06/08/11	0.0
	258	263	CO <sub>2</sub> (%)	07/23/10	0.3	11/04/10	0.35	01/18/11	0.35	06/08/11	0.36
			O <sub>2</sub> (%)	07/23/10	19	11/04/10	20.4	01/18/11	20.4	06/08/11	19.9
			PID (ppm)	NS	NS	11/10/10	0.1	01/18/11	0.0	06/08/11	0.0

Table D-1.0-1 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010 <sup>b</sup>		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15461	Ambient	Ambient	CO <sub>2</sub> (%)	07/23/10	0	11/04/10	0.034	01/14/11	0.05	06/16/11	0.0
			O <sub>2</sub> (%)	07/23/10	19.7	11/04/10	20.9	01/14/11	20.9	06/16/11	20.9
			PID (ppm)	NS	NS	11/09/10	0.0	01/14/11	0.0	06/16/11	0.0
	10	12	CO <sub>2</sub> (%)	07/23/10	0.7	11/04/10	0.50	01/14/11	0.44	06/16/11	0.76
			O <sub>2</sub> (%)	07/23/10	18.8	11/04/10	20.2	01/14/11	20.9	06/16/11	20.3
			PID (ppm)	NS	NS	11/09/10	0.2	01/14/11	0.0	06/16/11	0.0
	60	62	CO <sub>2</sub> (%)	07/23/10	0.6	11/04/10	0.62	01/14/11	0.40	06/16/11	0.87
			O <sub>2</sub> (%)	07/23/10	18.8	11/04/10	20.1	01/14/11	20.6	06/16/11	20.0
			PID (ppm)	NS	NS	11/09/10	0.3	01/14/11	0.0	06/16/11	0.0
	96	97	CO <sub>2</sub> (%)	07/23/10	0.6	11/04/10	0.52	01/14/11	0.43	06/16/11	0.91
			O <sub>2</sub> (%)	07/23/10	19	11/04/10	20.3	01/14/11	20.5	06/16/11	19.8
			PID (ppm)	NS	NS	11/09/10	0.1	01/14/11	0.0	06/16/11	0.0
54-15462	Ambient	Ambient	CO <sub>2</sub> (%)	07/22/10	0	11/05/10	0.036	01/19/11	0.05	06/10/11	0.0
			O <sub>2</sub> (%)	07/22/10	20	11/05/10	20.7	01/19/11	20.9	06/10/11	20.9
			PID (ppm)	NS	NS	11/12/10	0.0	01/19/11	0.0	06/10/11	0.0
	10	15	CO <sub>2</sub> (%)	07/22/10	0.7	11/05/10	0.84	01/19/11	0.58	06/10/11	0.85
			O <sub>2</sub> (%)	07/22/10	19.2	11/05/10	19.9	01/19/11	20.1	06/10/11	20.1
			PID (ppm)	NS	NS	11/12/10	0.4	01/19/11	0.0	06/10/11	0.0
	60	65	CO <sub>2</sub> (%)	07/22/10	0.7	11/05/10	0.65	01/19/11	0.48	06/10/11	1.1
			O <sub>2</sub> (%)	07/22/10	18.8	11/05/10	20.0	01/19/11	20.3	06/10/11	19.9
			PID (ppm)	NS	NS	11/12/10	0.2	01/19/11	0.0	06/10/11	0.0
	100	105	CO <sub>2</sub> (%)	07/22/10	0.6	11/05/10	0.49	01/19/11	0.48	06/10/11	0.94
			O <sub>2</sub> (%)	07/22/10	18.7	11/05/10	20.0	01/19/11	20.3	06/10/11	20.0
			PID (ppm)	NS	NS	11/12/10	0.2	01/19/11	0.0	06/10/11	0.0
	150	155	CO <sub>2</sub> (%)	07/22/10	0.5	11/05/10	0.48	01/19/11	0.34	06/10/11	0.71
			O <sub>2</sub> (%)	07/22/10	18.4	11/05/10	20.0	01/19/11	20.5	06/10/11	20.1
			PID (ppm)	NS	NS	11/12/10	0.1	01/19/11	0.0	06/10/11	0.0

Table D-1.0-1 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010 <sup>b</sup>		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462	200	205	CO <sub>2</sub> (%)	07/22/10	0.4	11/05/10	0.32	01/19/11	0.39	06/10/11	0.52
			O <sub>2</sub> (%)	07/22/10	18.3	11/05/10	20.2	01/19/11	20.3	06/10/11	20.1
			PID (ppm)	NS	NS	11/12/10	0.1	01/19/11	0.0	06/10/11	0.0
	245	250	CO <sub>2</sub> (%)	07/22/10	0.3	11/05/10	0.28	01/19/11	0.33	06/10/11	0.38
			O <sub>2</sub> (%)	07/22/10	18.3	11/05/10	20.2	01/19/11	20.3	06/10/11	20.1
			PID (ppm)	NS	NS	11/12/10	0.1	01/19/11	0.0	06/10/11	0.0
	258	263	CO <sub>2</sub> (%)	07/22/10	0.2	11/05/10	0.28	01/19/11	0.27	06/10/11	0.36
			O <sub>2</sub> (%)	07/22/10	18.3	11/05/10	20.3	01/19/11	20.3	06/10/11	20.1
			PID (ppm)	NS	NS	11/12/10	0.1	01/19/11	0.0	06/10/11	0.0
	280	285	CO <sub>2</sub> (%)	07/22/10	0.2	11/05/10	0.29	01/19/11	0.31	06/10/11	0.32
			O <sub>2</sub> (%)	07/22/10	18.3	11/05/10	20.4	01/19/11	20.3	06/10/11	20.2
			PID (ppm)	NS	NS	11/12/10	0.1	01/19/11	0.0	06/10/11	0.0
	295	300	CO <sub>2</sub> (%)	07/22/10	0.2	11/05/10	0.26	01/19/11	0.30	06/10/11	0.27
			O <sub>2</sub> (%)	07/22/10	18.7	11/05/10	20.4	01/19/11	20.3	06/10/11	20.3
			PID (ppm)	NS	NS	11/12/10	0.1	01/19/11	0.0	06/10/11	0.0
54-609985	Ambient	Ambient	CO <sub>2</sub> (%)	07/22/10	0	11/08/10	0.045	01/19/11	0.047	06/09/11	0.0
			O <sub>2</sub> (%)	07/22/10	19.6	11/08/10	20.9	01/19/11	20.9	06/09/11	20.9
			PID (ppm)	NS	NS	11/09/10	0.0	01/19/11	0.0	06/09/11	0.0
	4	9	CO <sub>2</sub> (%)	07/22/10	0.5	11/08/10	0.44	01/19/11	20.4	06/09/11	0.28
			O <sub>2</sub> (%)	07/22/10	19	11/08/10	20.2	01/19/11	0.37	06/09/11	20.4
			PID (ppm)	NS	NS	11/09/10	0.2	01/19/11	0.0	06/09/11	0.0
	60	65	CO <sub>2</sub> (%)	07/22/10	0.6	11/08/10	0.76	01/19/11	0.62	06/09/11	1.2
			O <sub>2</sub> (%)	07/22/10	18.8	11/08/10	19.9	01/19/11	19.9	06/09/11	20.0
			PID (ppm)	NS	NS	11/09/10	0.1	01/19/11	0.0	06/09/11	0.0
	100	105	CO <sub>2</sub> (%)	07/22/10	0.6	11/08/10	0.66	01/19/11	0.48	06/09/11	1.2
			O <sub>2</sub> (%)	07/22/10	18.8	11/08/10	20.0	01/19/11	20.4	06/09/11	20.0
			PID (ppm)	NS	NS	11/09/10	0.2	01/19/11	0.0	06/09/11	0.0

Table D-1.0-1 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010 <sup>b</sup>		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985	150	155	CO <sub>2</sub> (%)	07/22/10	0.5	11/08/10	0.61	01/19/11	0.56	06/09/11	1.0
			O <sub>2</sub> (%)	07/22/10	18.9	11/08/10	20.0	01/19/11	20.2	06/09/11	19.9
			PID (ppm)	NS	NS	11/09/10	0.1	01/19/11	0.0	06/09/11	0.0
	200	205	CO <sub>2</sub> (%)	07/22/10	0.4	11/09/10	NR <sup>e</sup>	01/19/11	0.50	06/09/11	0.71
			O <sub>2</sub> (%)	07/22/10	19	11/09/10	NR	01/19/11	20.2	06/09/11	20.0
			PID (ppm)	NS	NS	11/09/10	0.1	01/19/11	0.0	06/09/11	0.0
	245	250	CO <sub>2</sub> (%)	07/22/10	0.4	11/08/10	0.35	01/19/11	0.36	06/09/11	0.52
			O <sub>2</sub> (%)	07/22/10	19.1	11/08/10	20.2	01/19/11	20.4	06/09/11	20.1
			PID (ppm)	NS	NS	11/09/10	0.2	01/19/11	0.0	06/09/11	0.0
	258	263	CO <sub>2</sub> (%)	07/22/10	0.4	11/08/10	0.24	01/19/11	0.32	06/09/11	0.47
			O <sub>2</sub> (%)	07/22/10	18.9	11/08/10	20.4	01/19/11	20.4	06/09/11	20.1
			PID (ppm)	NS	NS	11/09/10	0.1	01/19/11	0.0	06/09/11	0.0
	280	285	CO <sub>2</sub> (%)	07/22/10	0.3	11/08/10	0.41	01/19/11	0.38	06/09/11	0.42
			O <sub>2</sub> (%)	07/22/10	18.9	11/08/10	20.2	01/19/11	20.4	06/09/11	20.2
			PID (ppm)	NS	NS	11/09/10	0.1	01/19/11	0.0	06/09/11	0.0
	295	300	CO <sub>2</sub> (%)	07/22/10	0.3	11/08/10	0.33	01/19/11	0.32	06/09/11	0.39
			O <sub>2</sub> (%)	07/22/10	19.1	11/08/10	20.3	01/19/11	20.5	06/09/11	20.0
			PID (ppm)	NS	NS	11/09/10	0.1	01/19/11	0.0	06/09/11	0.0

<sup>a</sup> bgs = Below ground surface.

<sup>b</sup> Samples taken with a LANDTEC GEM-2000 gas monitor.

<sup>c</sup> PID = Photoionization detector.

<sup>d</sup> NS = Not sampled.

<sup>e</sup> NR = Not reported.

**Table D-1.0-2  
Summary of VOCs Detected in Pore-Gas Samples at MDA H, in  $\mu\text{g}/\text{m}^3$**

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result ( $\mu\text{g}/\text{m}^3$ )	Collection Date	Result ( $\mu\text{g}/\text{m}^3$ )	Collection Date	Result ( $\mu\text{g}/\text{m}^3$ )	Collection Date	Result ( $\mu\text{g}/\text{m}^3$ )
54-01023	10	15	Acetone	07/23/10	ND <sup>b</sup>	11/04/10	ND	01/18/11	ND	06/08/11	12
			Benzene	07/23/10	ND	11/04/10	ND	01/18/11	3.3	06/08/11	ND
			Chloroform	07/23/10	ND	11/04/10	ND	01/18/11	5.3	06/08/11	8.1
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	10	06/08/11	10
			Ethanol	07/23/10	ND	11/04/10	ND	01/18/11	28	06/08/11	ND
			Hexane	07/23/10	ND	11/04/10	ND	01/18/11	3.8	06/08/11	ND
			Methylene Chloride	07/23/10	ND	11/04/10	ND	01/18/11	2.7	06/08/11	ND
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	9.8	06/08/11	14
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	11
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	16	06/08/11	5.8
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	16	06/08/11	22
			Trimethylbenzene[1,2,4-]	07/23/10	ND	11/04/10	ND	01/18/11	3.9	06/08/11	ND
			Xylene[1,3-]+Xylene[1,4-]	07/23/10	ND	11/04/10	ND	01/18/11	4.6	06/08/11	ND
	60	65	Dichlorodifluoromethane	07/23/10	50	11/04/10	ND	01/18/11	ND	06/08/11	ND
			Trichlorofluoromethane	07/23/10	81	11/04/10	68	01/18/11	60	06/08/11	57
	100	105	Acetone	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	24
			Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	15
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	32	06/08/11	22
			Ethanol	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	14
			Methylene Chloride	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	4.9
n-Heptane			07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	13	
Tetrachloroethene			07/23/10	ND	11/04/10	ND	01/18/11	7.5	06/08/11	27	
Toluene			07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	14	
Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	11	06/08/11	8.8			

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-01023	100	105	Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	25	06/08/11	21
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	9.6	06/08/11	9.1
			Trichlorofluoromethane	07/23/10	52	11/04/10	61	01/18/11	56	06/08/11	38
			Xylene[1,3-]+Xylene[1,4-]	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	4.4
	150	155	Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	5.5	06/08/11	ND
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	27	06/08/11	30
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	18
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	15	06/08/11	8.8
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	38	06/08/11	38
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	7.7	06/08/11	7.9
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	39	06/08/11	40
	200	205	Acetone	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	14
			Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	7.7	06/08/11	9.5
			Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	10	06/08/11	11
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	26	06/08/11	30
			Dichloropropane[1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	6.5	06/08/11	6.7
			Ethanol	07/23/10	210	11/04/10	ND	01/18/11	ND	06/08/11	ND
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	21
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	13	06/08/11	16
Trichloroethane[1,1,1-]			07/23/10	ND	11/04/10	ND	01/18/11	27	06/08/11	30	
Trichloroethene			07/23/10	ND	11/04/10	ND	01/18/11	8.4	06/08/11	8.1	
Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	31	06/08/11	35			

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-01023	245	250	Acetone	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	29
			Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	9.2	06/08/11	11
			Carbon Disulfide	07/23/10	ND	11/04/10	44	01/18/11	ND	06/08/11	ND
			Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	11	06/08/11	10
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	22	06/08/11	25
			Dichloropropane[1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	4.8	06/08/11	4.7
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	16
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	13	06/08/11	11
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	15	06/08/11	16
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	6.2	06/08/11	ND
	Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	27	06/08/11	27		
	258	263	Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	9.5	06/08/11	11
			Chlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	13
			Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	6.8	06/08/11	11
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	23	06/08/11	25
			Methylene Chloride	07/23/10	ND	11/04/10	160	01/18/11	ND	06/08/11	ND
			n-Heptane	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	3.6 (J)
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	18
			Toluene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	3.9
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	12	06/08/11	13
Trichloroethane[1,1,1-]			07/23/10	ND	11/04/10	ND	01/18/11	12	06/08/11	14	
Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	6.5	06/08/11	5.7			
Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	25	06/08/11	25			

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs) <sup>a</sup>	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-15461	10	12	Acetone	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	10
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	14
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	21
			Toluene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	4.8
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	11
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	12
	60	62	Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	17	06/16/11	23
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	21
			Toluene	07/23/10	ND	11/04/10	ND	01/14/11	4.2	06/16/11	4
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	7.2
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/14/11	10	06/16/11	21
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	5.3
	95	97	Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	16	06/16/11	22
			Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	5.9
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	17	06/16/11	22
			Ethanol	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	10
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	18
			Toluene	07/23/10	ND	11/04/10	ND	01/14/11	3.3	06/16/11	5.4
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/14/11	10	06/16/11	15
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	17	06/16/11	21
	Xylene[1,3-]+Xylene[1,4-]	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	4.2		
54-15462	10	15	Chloroform	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	9.1
			Dichlorodifluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	21
			Tetrachloroethene	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	12



Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-15462	10	15	Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	12
			Trichloroethane[1,1,1-]	07/22/10	68	11/05/10	58	01/19/11	56	06/10/11	60
			Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	24
	60	65	Carbon Disulfide	07/22/10	ND	11/05/10	37	01/19/11	ND	06/10/11	ND
			Chloroform	07/22/10	ND	11/05/10	45	01/19/11	ND	06/10/11	ND
			Dichlorodifluoromethane	07/22/10	55	11/05/10	44	01/19/11	50	06/10/11	ND
			Trichloroethane[1,1,1-]	07/22/10	99	11/05/10	120	01/19/11	110	06/10/11	110
			Trichlorofluoromethane	07/22/10	ND	11/05/10	50	01/19/11	ND	06/10/11	ND
	100	105	Dichlorodifluoromethane	07/22/10	58	11/05/10	46	01/19/11	52	06/10/11	ND
			Trichloroethane[1,1,1-]	07/22/10	120	11/05/10	110	01/19/11	120	06/10/11	110
			Trichlorofluoromethane	07/22/10	50	11/05/10	50	01/19/11	48	06/10/11	ND
	150	155	Chloroform	07/22/10	80	11/05/10	75	01/19/11	65	06/10/11	49
			Dichlorodifluoromethane	07/22/10	79	11/05/10	62	01/19/11	73	06/10/11	56
			Trichloroethane[1,1,1-]	07/22/10	120	11/05/10	150	01/19/11	140	06/10/11	120
			Trichlorofluoromethane	07/22/10	56	11/05/10	68	01/19/11	59	06/10/11	54
	200	205	Benzene	07/22/10	ND	11/05/10	ND	01/19/11	36	06/10/11	ND
			Chloroform	07/22/10	66	11/05/10	43	01/19/11	44	06/10/11	46
			Cyclohexane	07/22/10	ND	11/05/10	ND	01/19/11	28	06/10/11	ND
			Dichlorodifluoromethane	07/22/10	68	11/05/10	48	01/19/11	53	06/10/11	61
			Ethanol	07/22/10	ND	11/05/10	ND	01/19/11	84	06/10/11	ND
			Hexane	07/22/10	ND	11/05/10	ND	01/19/11	58	06/10/11	ND
Toluene			07/22/10	ND	11/05/10	ND	01/19/11	91	06/10/11	ND	
Trichloroethane[1,1,1-]			07/22/10	74	11/05/10	70	01/19/11	70	06/10/11	84	
Xylene[1,3-]+Xylene[1,4-]	07/22/10	ND	11/05/10	ND	01/19/11	35	06/10/11	ND			

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-15462	245	250	Acetone	07/22/10	ND	11/05/10	ND	03/29/11	16	06/10/11	ND
			Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	03/29/11	11	06/10/11	ND
			Chlorodifluoromethane	07/22/10	ND	11/05/10	ND	03/29/11	13	06/10/11	ND
			Cyclohexane	07/22/10	ND	11/05/10	ND	03/29/11	12	06/10/11	ND
			Dichlorodifluoromethane	07/22/10	46	11/05/10	61	03/29/11	24	06/10/11	49
			Dichloropropane[1,2-]	07/22/10	ND	11/05/10	ND	03/29/11	6	06/10/11	ND
			Ethanol	07/22/10	ND	11/05/10	ND	03/29/11	20	06/10/11	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	03/29/11	13	06/10/11	ND
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	03/29/11	15	06/10/11	50
	Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	03/29/11	24	06/10/11	ND		
	258	263	Acetone	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	13
			Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	7
			Chlorodifluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	16
			Chloroform	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	27
			Dichlorodifluoromethane	07/22/10	63	11/05/10	43	01/19/11	53	06/10/11	58
			Hexane	07/22/10	ND	11/05/10	ND	01/19/11	39	06/10/11	ND
			Methylene Chloride	07/22/10	ND	11/05/10	48	01/19/11	ND	06/10/11	ND
			Toluene	07/22/10	ND	11/05/10	ND	01/19/11	61	06/10/11	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	29
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	56
Trichloroethene			07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	6.3	
Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	46			
280	285	Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	7.1	
		Chloroform	07/22/10	49	11/05/10	ND	01/19/11	ND	06/10/11	34	

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-15462	280	285	Cyclohexane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	21
			Dichlorodifluoromethane	07/22/10	55	11/05/10	ND	01/19/11	48	06/10/11	46
			Tetrachloroethene	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	7
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	22
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	36
			Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	36
	295	300	Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	6.2
			Chloroform	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	26
			Cyclohexane	07/22/10	ND	11/05/10	30 (J)	01/19/11	34	06/10/11	25
			Dichlorodifluoromethane	07/22/10	49	11/05/10	ND	01/19/11	45	06/10/11	39
			Tetrachloroethene	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	6.2
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	21
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	24
			Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	28
54-609985	4	9	Acetone	07/22/10	ND	11/08/10	ND	01/19/11	8.1	06/09/11	ND
			Benzene	07/22/10	ND	11/08/10	ND	01/19/11	4.3	06/09/11	ND
			Carbon Disulfide	07/22/10	ND	11/08/10	ND	01/19/11	4.4	06/09/11	ND
			Chloroform	07/22/10	ND	11/08/10	ND	01/19/11	4.6	06/09/11	ND
			Dichlorodifluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	20	06/09/11	9.1
			Ethanol	07/22/10	ND	11/08/10	ND	01/19/11	11	06/09/11	ND
			Hexane	07/22/10	ND	11/08/10	ND	01/19/11	7.3	06/09/11	ND
			Tetrachloroethene	07/22/10	ND	11/08/10	ND	01/19/11	13	06/09/11	7.9
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	14	06/09/11	ND

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-609985	4	9	Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/08/10	ND	01/19/11	11	06/09/11	ND
			Trichloroethane[1,1,1-]	07/22/10	ND	11/08/10	ND	01/19/11	51	06/09/11	14
			Trichloroethene	07/22/10	ND	11/08/10	ND	01/19/11	23	06/09/11	ND
			Trichlorofluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	21	06/09/11	9
			Xylene[1,3-]+Xylene[1,4-]	07/22/10	ND	11/08/10	ND	01/19/11	5.3	06/09/11	ND
	60	65	Acetone	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	25
			Chloroform	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	16
			Dichlorodifluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	47	06/09/11	38
			Ethanol	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	13
			Methylene Chloride	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	3.8
			Tetrachloroethene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	22
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	4.4
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	14
			Trichloroethane[1,1,1-]	07/22/10	52	11/08/10	ND	01/19/11	ND	06/09/11	47
			Trichloroethene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	7.7
	Trichlorofluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	43		
	100	105	Acetone	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	14
			Chloroform	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	9.6
			Dichlorodifluoromethane	07/22/10	50	11/08/10	ND	01/19/11	58	06/09/11	52
			Tetrachloroethene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	28
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	19
Trichloroethane[1,1,1-]			07/22/10	63	11/08/10	ND	01/19/11	50	06/09/11	64	
Trichloroethene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	11			

Table D-1.0-2 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )	Collection Date	Result (µg/m <sup>3</sup> )
54-609985	100	105	Trichlorofluoromethane	07/22/10	52	11/08/10	ND	01/19/11	ND	06/09/11	54
	150	155	Dichlorodifluoromethane	07/22/10	51	11/08/10	ND	01/19/11	50	06/09/11	43
			Trichloroethane[1,1,1-]	07/22/10	67	11/08/10	57	01/19/11	51	06/09/11	52
	200	205	Chloroform	07/22/10	53	11/08/10	ND	01/19/11	ND	06/09/11	ND
			Cyclohexane	07/22/10	46	11/08/10	36	01/19/11	40	06/09/11	47
			Dichlorodifluoromethane	07/22/10	53	11/08/10	ND	01/19/11	54	06/09/11	41
			Methylene Chloride	07/22/10	ND	11/08/10	51	01/19/11	ND	06/09/11	ND
			Trichloroethane[1,1,1-]	07/22/10	50	11/08/10	ND	01/19/11	ND	06/09/11	ND
	245	250	Cyclohexane	07/22/10	74	11/08/10	51	01/19/11	110	06/09/11	76
			Dichlorodifluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	42	06/09/11	ND
			Hexane	07/22/10	ND	11/08/10	ND	01/19/11	38	06/09/11	ND
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	64	06/09/11	ND
	258	263	Cyclohexane	07/22/10	83	11/08/10	62	01/19/11	64	06/09/11	86
			Dichlorodifluoromethane	07/22/10	47	11/08/10	ND	01/19/11	ND	06/09/11	ND
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	41	06/09/11	ND
	280	285	Cyclohexane	07/22/10	76	11/08/10	80	01/19/11	98	06/09/11	95
			Dichlorodifluoromethane	07/22/10	47	11/08/10	ND	01/19/11	48	06/09/11	ND
295	300	Cyclohexane	07/22/10	110	11/08/10	81	01/19/11	93	06/09/11	110	

<sup>a</sup> bgs = Below ground surface.

<sup>b</sup> ND = Not detected.

**Table D-1.0-3  
Summary of VOCs Detected in Pore-Gas Samples at MDA H, in ppbv**

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-01023	10	15	Acetone	07/23/10	ND <sup>b</sup>	11/04/10	ND	01/18/11	ND	06/08/11	5.2
			Benzene	07/23/10	ND	11/04/10	ND	01/18/11	1	06/08/11	ND
			Chloroform	07/23/10	ND	11/04/10	ND	01/18/11	1.1	06/08/11	1.7
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	2	06/08/11	2
			Ethanol	07/23/10	ND	11/04/10	ND	01/18/11	15	06/08/11	ND
			Hexane	07/23/10	ND	11/04/10	ND	01/18/11	1.1	06/08/11	ND
			Methylene Chloride	07/23/10	ND	11/04/10	ND	01/18/11	0.78	06/08/11	ND
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	1.4	06/08/11	2.1
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	2
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	3	06/08/11	1.1
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	2.8	06/08/11	3.9
			Trimethylbenzene[1,2,4-]	07/23/10	ND	11/04/10	ND	01/18/11	0.79	06/08/11	ND
	Xylene[1,3-]+Xylene[1,4-]	07/23/10	ND	11/04/10	ND	01/18/11	1.1	06/08/11	ND		
	60	65	Dichlorodifluoromethane	07/23/10	10	11/04/10	ND	01/18/11	ND	06/08/11	ND
Trichlorofluoromethane			07/23/10	14	11/04/10	12	01/18/11	11	06/08/11	10	
100	105	Acetone	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	10	
		Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	4.2	
		Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	6.5	06/08/11	4.4	
		Ethanol	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	7.2	
		Methylene Chloride	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	1.4	
		n-Heptane	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	3.2	
		Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	1.1	06/08/11	4	

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-01023	100	105	Toluene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	3.8
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	1.5	06/08/11	1.2
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	4.6	06/08/11	3.8
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	1.8	06/08/11	1.7
			Trichlorofluoromethane	07/23/10	9.4	11/04/10	11	01/18/11	10	06/08/11	6.7
			Xylene[1,3-]+Xylene[1,4-]	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	1
	150	155	Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	0.88	06/08/11	ND
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	5.5	06/08/11	6.1
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	2.7
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	1.9	06/08/11	1.2
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	6.9	06/08/11	7
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	1.4	06/08/11	1.5
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	7	06/08/11	7.1
	200	205	Acetone	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	6
			Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	1.2	06/08/11	1.5
			Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	2.9	06/08/11	3.3
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	5.3	06/08/11	6.2
			Dichloropropane[1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	1.4	06/08/11	1.4
			Ethanol	07/23/10	110	11/04/10	ND	01/18/11	ND	06/08/11	ND
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	3.1
Trichloro-1,2,2-trifluoroethane[1,1,2-]			07/23/10	ND	11/04/10	ND	01/18/11	1.7	06/08/11	2.1	
Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	5	06/08/11	5.4			

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-01023	200	205	Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	1.6	06/08/11	1.5
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	5.6	06/08/11	6.3
	245	250	Acetone	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	12
			Carbon Disulfide	07/23/10	ND	11/04/10	14	01/18/11	ND	06/08/11	ND
			Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	1.5	06/08/11	1.7
			Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	3.1	06/08/11	3
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	4.5	06/08/11	5
			Dichloropropane[1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	1	06/08/11	1
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	2.4
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/18/11	1.7	06/08/11	1.4
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	2.7	06/08/11	2.9
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	1.2	06/08/11	ND
	Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	4.8	06/08/11	4.7		
	258	263	Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/18/11	1.5	06/08/11	1.7
			Chlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	3.6
			Cyclohexane	07/23/10	ND	11/04/10	ND	01/18/11	2	06/08/11	3.2
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	4.7	06/08/11	5
			Methylene Chloride	07/23/10	ND	11/04/10	45	01/18/11	ND	06/08/11	ND
			n-Heptane	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	0.87 (J)
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	2.7
Toluene			07/23/10	ND	11/04/10	ND	01/18/11	ND	06/08/11	1	
Trichloro-1,2,2-trifluoroethane[1,1,2-]			07/23/10	ND	11/04/10	ND	01/18/11	1.6	06/08/11	1.6	
Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/18/11	2.3	06/08/11	2.6			



Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-01023	258	263	Trichloroethene	07/23/10	ND	11/04/10	ND	01/18/11	1.2	06/08/11	1
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/18/11	4.5	06/08/11	4.4
54-15461	10	12	Acetone	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	4.4
			Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	2.9
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	3.1
			Toluene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	1.3
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	2.1
			Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	2.1
	60	62	Dichlorodifluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	3.4	06/16/11	4.6
			Tetrachloroethene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	3.1
			Toluene	07/23/10	ND	11/04/10	ND	01/14/11	1.1	06/16/11	1
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	0.94
			Trichloroethane[1,1,1-]	07/23/10	ND	11/04/10	ND	01/14/11	1.8	06/16/11	3.8
			Trichloroethene	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	0.99
	95	97	Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	2.9	06/16/11	4
			Carbon Tetrachloride	07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	0.94
Dichlorodifluoromethane			07/23/10	ND	11/04/10	ND	01/14/11	3.4	06/16/11	4.5	
Ethanol			07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	5.4	
Tetrachloroethene			07/23/10	ND	11/04/10	ND	01/14/11	ND	06/16/11	2.6	
Toluene			07/23/10	ND	11/04/10	ND	01/14/11	0.86	06/16/11	1.4	
Trichloroethane[1,1,1-]			07/23/10	ND	11/04/10	ND	01/14/11	1.9	06/16/11	2.7	
Trichlorofluoromethane	07/23/10	ND	11/04/10	ND	01/14/11	3.1	06/16/11	3.8			
54-15462	10	15	Chloroform	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	1.9
			Dichlorodifluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	4.3

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15462	10	15	Tetrachloroethene	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	1.8
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	1.5
			Trichloroethane[1,1,1-]	07/22/10	12	11/05/10	11	01/19/11	10	06/10/11	11
			Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	4.4
	60	65	Carbon Disulfide	07/22/10	ND	11/05/10	12	01/19/11	ND	06/10/11	ND
			Chloroform	07/22/10	ND	11/05/10	9.2	01/19/11	ND	06/10/11	ND
			Dichlorodifluoromethane	07/22/10	11	11/05/10	8.9	01/19/11	10	06/10/11	ND
			Trichloroethane[1,1,1-]	07/22/10	18	11/05/10	21	01/19/11	20	06/10/11	19
			Trichlorofluoromethane	07/22/10	ND	11/05/10	9	01/19/11	ND	06/10/11	ND
	100	105	Dichlorodifluoromethane	07/22/10	12	11/05/10	9.4	01/19/11	10	06/10/11	ND
			Trichloroethane[1,1,1-]	07/22/10	21	11/05/10	21	01/19/11	22	06/10/11	20
			Trichlorofluoromethane	07/22/10	9	11/05/10	8.8	01/19/11	8.5	06/10/11	ND
	150	155	Chloroform	07/22/10	16	11/05/10	15	01/19/11	13	06/10/11	10
			Dichlorodifluoromethane	07/22/10	16	11/05/10	12	01/19/11	15	06/10/11	11
			Trichloroethane[1,1,1-]	07/22/10	22	11/05/10	27	01/19/11	26	06/10/11	23
			Trichlorofluoromethane	07/22/10	10	11/05/10	12	01/19/11	10	06/10/11	9.6
	200	205	Benzene	07/22/10	ND	11/05/10	ND	01/19/11	11	06/10/11	ND
			Chloroform	07/22/10	13	11/05/10	8.8	01/19/11	9	06/10/11	9.3
			Cyclohexane	07/22/10	ND	11/05/10	ND	01/19/11	8.3	06/10/11	ND
			Dichlorodifluoromethane	07/22/10	14	11/05/10	9.8	01/19/11	11	06/10/11	12
Ethanol			07/22/10	ND	11/05/10	ND	01/19/11	45	06/10/11	ND	
Hexane			07/22/10	ND	11/05/10	ND	01/19/11	16	06/10/11	ND	
Toluene			07/22/10	ND	11/05/10	ND	01/19/11	24	06/10/11	ND	
Trichloroethane[1,1,1-]			07/22/10	14	11/05/10	13	01/19/11	13	06/10/11	15	
Xylene[1,3-]+Xylene[1,4-]	07/22/10	ND	11/05/10	ND	01/19/11	8.1	06/10/11	ND			

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15462	245	250	Acetone	07/22/10	ND	11/05/10	ND	03/29/11	6.5	06/10/11	ND
			Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	03/29/11	1.8	06/10/11	ND
			Chlorodifluoromethane	07/22/10	ND	11/05/10	ND	03/29/11	3.7	06/10/11	ND
			Cyclohexane	07/22/10	ND	11/05/10	ND	03/29/11	3.5	06/10/11	ND
			Dichlorodifluoromethane	07/22/10	9.3	11/05/10	12	03/29/11	4.9	06/10/11	10
			Dichloropropane[1,2-]	07/22/10	ND	11/05/10	ND	03/29/11	1.3	06/10/11	ND
			Ethanol	07/22/10	ND	11/05/10	ND	03/29/11	10	06/10/11	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	03/29/11	1.7	06/10/11	ND
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	03/29/11	2.7	06/10/11	9.2
	Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	03/29/11	4.3	06/10/11	ND		
	258	263	Acetone	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	5.5
			Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	1.1
			Chlorodifluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	4.5
			Chloroform	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	5.6
			Dichlorodifluoromethane	07/22/10	13	11/05/10	8.7	01/19/11	11	06/10/11	12
			Hexane	07/22/10	ND	11/05/10	ND	01/19/11	11	06/10/11	ND
			Methylene Chloride	07/22/10	ND	11/05/10	14	01/19/11	ND	06/10/11	ND
			Toluene	07/22/10	ND	11/05/10	ND	01/19/11	16	06/10/11	ND
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	3.7
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	10
Trichloroethene			07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	1.2	
Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	8.1			
280	285	Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	1.1	
		Chloroform	07/22/10	10	11/05/10	ND	01/19/11	ND	06/10/11	7	

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs) <sup>a</sup>	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-15462	280	285	Cyclohexane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	6.2
			Dichlorodifluoromethane	07/22/10	11	11/05/10	ND	01/19/11	9.6	06/10/11	9.3
			Tetrachloroethene	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	1
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	2.9
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	6.7
			Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	6.4
	295	300	Carbon Tetrachloride	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	0.98
			Chloroform	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	5.4
			Cyclohexane	07/22/10	ND	11/05/10	8.7 (J)	01/19/11	9.9	06/10/11	7.3
			Dichlorodifluoromethane	07/22/10	9.9	11/05/10	ND	01/19/11	9.2	06/10/11	7.9
			Tetrachloroethene	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	0.91
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	2.7
			Trichloroethane[1,1,1-]	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	4.5
			Trichlorofluoromethane	07/22/10	ND	11/05/10	ND	01/19/11	ND	06/10/11	5
54-609985	4	9	Acetone	07/22/10	ND	11/08/10	ND	01/19/11	3.4	06/09/11	ND
			Benzene	07/22/10	ND	11/08/10	ND	01/19/11	1.3	06/09/11	ND
			Carbon Disulfide	07/22/10	ND	11/08/10	ND	01/19/11	1.4	06/09/11	ND
			Chloroform	07/22/10	ND	11/08/10	ND	01/19/11	0.93	06/09/11	ND
			Dichlorodifluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	4.1	06/09/11	1.8
			Ethanol	07/22/10	ND	11/08/10	ND	01/19/11	6	06/09/11	ND
			Hexane	07/22/10	ND	11/08/10	ND	01/19/11	2.1	06/09/11	ND
			Tetrachloroethene	07/22/10	ND	11/08/10	ND	01/19/11	2	06/09/11	1.2
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	3.8	06/09/11	ND

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-609985	4	9	Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/08/10	ND	01/19/11	1.5	06/09/11	ND
			Trichloroethane[1,1,1-]	07/22/10	ND	11/08/10	ND	01/19/11	9.4	06/09/11	2.6
			Trichloroethene	07/22/10	ND	11/08/10	ND	01/19/11	4.4	06/09/11	ND
			Trichlorofluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	3.7	06/09/11	1.6
			Xylene[1,3-]+Xylene[1,4-]	07/22/10	ND	11/08/10	ND	01/19/11	1.2	06/09/11	ND
	60	65	Acetone	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	10
			Chloroform	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	3.3
			Dichlorodifluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	9.4	06/09/11	7.8
			Ethanol	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	6.7
			Methylene Chloride	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	1.1
			Tetrachloroethene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	3.2
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	1.2
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	1.8
			Trichloroethane[1,1,1-]	07/22/10	9.6	11/08/10	ND	01/19/11	ND	06/09/11	8.6
			Trichloroethene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	1.4
	Trichlorofluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	7.7		
	100	105	Acetone	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	6
			Chloroform	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	2
			Dichlorodifluoromethane	07/22/10	10	11/08/10	ND	01/19/11	12	06/09/11	10
			Tetrachloroethene	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	4.1
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	2.4
Trichloroethane[1,1,1-]			07/22/10	12	11/08/10	ND	01/19/11	9.3	06/09/11	12	
Trichloroethene			07/22/10	ND	11/08/10	ND	01/19/11	ND	06/09/11	2.1	

Table D-1.0-3 (continued)

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	Analyte	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
				Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)	Collection Date	Result (ppbv)
54-609985	100	105	Trichlorofluoromethane	07/22/10	9.3	11/08/10	ND	01/19/11	ND	06/09/11	9.6
	150	155	Dichlorodifluoromethane	07/22/10	10	11/08/10	ND	01/19/11	10	06/09/11	8.8
			Trichloroethane[1,1,1-]	07/22/10	12	11/08/10	10	01/19/11	9.3	06/09/11	9.6
	200	205	Chloroform	07/22/10	11	11/08/10	ND	01/19/11	ND	06/09/11	ND
			Cyclohexane	07/22/10	13	11/08/10	11	01/19/11	12	06/09/11	14
			Dichlorodifluoromethane	07/22/10	11	11/08/10	ND	01/19/11	11	06/09/11	8.4
			Methylene Chloride	07/22/10	ND	11/08/10	14	01/19/11	ND	06/09/11	ND
			Trichloroethane[1,1,1-]	07/22/10	9.1	11/08/10	ND	01/19/11	ND	06/09/11	ND
	245	250	Cyclohexane	07/22/10	21	11/08/10	15	01/19/11	32	06/09/11	22
			Dichlorodifluoromethane	07/22/10	ND	11/08/10	ND	01/19/11	8.6	06/09/11	ND
			Hexane	07/22/10	ND	11/08/10	ND	01/19/11	11	06/09/11	ND
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	17	06/09/11	ND
	258	263	Cyclohexane	07/22/10	24	11/08/10	18	01/19/11	19	06/09/11	25
			Dichlorodifluoromethane	07/22/10	9.5	11/08/10	ND	01/19/11	ND	06/09/11	ND
			Toluene	07/22/10	ND	11/08/10	ND	01/19/11	11	06/09/11	ND
	280	285	Cyclohexane	07/22/10	22	11/08/10	23	01/19/11	28	06/09/11	28
			Dichlorodifluoromethane	07/22/10	9.5	11/08/10	ND	01/19/11	9.6	06/09/11	ND
295	300	Cyclohexane	07/22/10	31	11/08/10	24	01/19/11	27	06/09/11	32	

<sup>a</sup> bgs = Below ground surface.

<sup>b</sup> ND = Not detected.

**Table D-1.0-4  
Summary of Tritium Results at MDA H**

Vapor-Monitoring Well ID	Begin Depth (ft bgs <sup>a</sup> )	End Depth (ft bgs)	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
			Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)
54-01023	10	15	07/27/10	3190000	11/08/10	2290000	01/20/11	3780000	06/21/11	6240000
	60	65	07/27/10	3910000	11/09/10	3010000	01/19/11	3570000	06/21/11	4640000
	100	105	07/27/10	608000	11/09/10	565000	01/19/11	337000	06/21/11	702000
	150	155	07/27/10	255000	11/09/10	283000	01/20/11	474000	06/21/11	322000
	200	205	07/27/10	77300	11/08/10	86800	01/19/11	73700	06/21/11	218000
	245	250	07/27/10	86300	11/09/10	83700	01/19/11	86900	06/21/11	85900
	258	263	07/27/10	121000	11/08/10	103000	01/19/11	68000	06/21/11	89900
54-15461	10	12	07/30/10	ND <sup>b</sup>	11/05/10	2220	01/18/11	2340	06/23/11	5100
	60	62	07/30/10	ND	11/05/10	789	01/18/11	264	06/23/11	569
	95	97	07/30/10	ND	11/05/10	719	01/18/11	350	06/23/11	572
54-15462	10	15	07/26/10	542	11/10/10	ND	01/25/11	ND	NS <sup>c</sup>	NS
	60	65	07/26/10	ND	11/12/10	ND	01/25/11	677	NS	NS
	100	105	07/26/10	807	11/12/10	4130	01/25/11	ND	NS	NS
	150	155	07/26/10	ND	11/12/10	10900	02/01/11	738	NS	NS
	200	205	07/26/10	ND	11/10/10	630000	01/25/11	ND	NS	NS
	245	250	07/26/10	438	11/10/10	1530	01/25/11	ND	NS	NS
	258	263	07/26/10	539	11/12/10	ND	01/25/11	ND	NS	NS
	280	285	07/26/10	503	11/10/10	1590	01/25/11	ND	NS	NS
54-609985	4	9	07/28/10	12900	11/15/10	ND	01/25/11	1580	06/24/11	21500
	60	65	07/28/10	6680	11/15/10	ND	01/26/11	5150	06/24/11	8780
	100	105	07/28/10	ND	11/15/10	ND	01/26/11	2500	06/24/11	4450

**Table D-1.0-4 (continued)**

Vapor-Monitoring Well ID	Begin Depth (ft bgs)	End Depth (ft bgs)	4th Quarter FY2010		1st Quarter FY2011		2nd Quarter FY2011		3rd Quarter FY2011	
			Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)	Collection Date	Result (pCi/L)
54-609985	150	155	07/28/10	ND	11/15/10	ND	01/28/11	766	06/24/11	1070
54-609985	200	205	07/29/10	ND	11/15/10	ND	01/26/11	605	06/24/11	ND
54-609985	245	250	07/29/10	ND	11/15/10	ND	01/27/11	328	07/07/11	17500
54-609985	258	263	07/29/10	ND	11/15/10	ND	01/26/11	3100	07/07/11	319
54-609985	280	285	07/29/10	ND	11/15/10	ND	01/26/11	ND	07/07/11	376
54-609985	295	300	07/29/10	ND	11/15/10	ND	01/27/11	602	07/07/11	11700

<sup>a</sup> bgs = Below ground surface.

<sup>b</sup> ND = Not detected.

<sup>c</sup> NS = Not sampled.



## **Attachment D-1**

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

