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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, First Quarter Fiscal Year 2010

Prepared by the Environmental Programs Directorate

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EXECUTIVE SUMMARY

This periodic monitoring report summarizes vapor-monitoring activities conducted during the first quarter of fiscal year (FY) 2010 at Material Disposal Area (MDA) H, Solid Waste Management Unit 54-004, in Technical Area 54 at Los Alamos National Laboratory. The objective of the monitoring is to evaluate trends in volatile organic compound (VOC) concentrations and tritium activity levels over time in subsurface vapor at MDA H.

Monitoring conducted during the first quarter of FY2010 included field screening and collecting vapor samples from 28 sampling ports within 4 vapor-monitoring boreholes at MDA H. Vapor samples were submitted for laboratory analyses of VOCs and tritium.

The analytical results continue to confirm the presence of VOCs and tritium in pore-vapor samples collected at MDA H. VOC concentrations detected were consistent with previous sampling results. The maximum concentrations for all VOCs detected in pore gas during first quarter FY2010 and during the last three quarters of FY2009 did not exceed groundwater screening levels. No immediate potential threat to groundwater is posed by VOCs measured at MDA H monitoring locations.

Tritium values decreased with distance from MDA H and with depth in borehole 54-01023. The tritium activities for borehole 54-01023 were generally 1 order of magnitude (a factor of 10) less than what was detected during the last three quarters of sampling. The Laboratory reviewed the field logs and laboratory quality assurance documentation and has not identified any discrepancies. It should be noted that a new stainless-steel sampling system was installed before sampling was conducted. No tritium was detected in the newly drilled borehole 54-609985.

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1.0 INTRODUCTION

This periodic monitoring report presents the results of vapor-monitoring activities conducted during the first quarter of fiscal year (FY) 2010 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).

MDA H is located in the east-central portion of the Laboratory at TA-54 (Figure 1.0-1) on Mesita del Buey. MDA H is a 70-ft by 200-ft (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 fence line (Figure 1.0-2). 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).

From May 1960 to August 1986, MDA H functioned as the Laboratory's primary disposal area for classified solid-form waste. Between periods of waste disposal, each shaft was covered with a padlocked steel plate to prevent unauthorized access to classified materials. Much of the classified waste was nonhazardous; however, various hazardous chemicals, radionuclide-contaminated materials, and materials contaminated by high explosives were also disposed of at MDA H. These materials included scraps and shapes contaminated with depleted uranium, drummed radioactive waste, fuel elements, a tritium-contaminated unit, plutonium-contaminated shapes, and decontamination and decommissioning scrap. According to waste disposal records, VOCs and SVOCs were not disposed of at MDA H. However, organic solvents may have been used to clean the classified shapes disposed of at the site (LANL 2001, 070158).

Vapor monitoring at MDA H consists of screening 28 sampling ports in four vapor-monitoring boreholes (Figure 1.0-2). Volatile organic compound (VOC) and tritium samples are collected from each of the 28 sampling ports completed within each stratigraphic unit. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with U.S. Department of Energy policy.

Vapor monitoring at MDA H has been conducted since the second quarter of FY2005. The NMED-approved vapor-monitoring boreholes and the corresponding sampling intervals that were field screened and sampled through fourth quarter of FY2009 are presented in Table 1.0-1. The NMED-approved vapor-monitoring boreholes and the corresponding sampling intervals that were field screened during first quarter FY2010 are presented in Table 1.0-2. A summary of vapor-monitoring activities follows.

- On April 11, 2003, NMED sent a letter (NMED 2003, 075939) approving the Resource Conservation and Recovery Act facility investigation report for MDA H (LANL 2001, 070158) and subsequent addendum to the report (LANL 2002, 073270).
- In May 2003, the Laboratory submitted the corrective measures study for MDA H (LANL 2003, 076039) identifying a preferred remedy. Comments were received from NMED, and the report was reissued in June 2005 (LANL 2005, 089332).
- In December 2004, NMED sent a letter (NMED 2004, 092217) requesting the Laboratory collect quarterly subsurface vapor-monitoring samples from boreholes 54-15461, 54-15462, and 54-01023 to provide data to facilitate NMED's selection of an appropriate remedy for MDA H.

- In February 2005, the Laboratory began quarterly pore-gas monitoring using an inflatable packer sampling system. In March 2006, the Laboratory installed dedicated Flexible Liner Underground Technology (FLUTe) sampling membranes into each MDA H pore-gas monitoring borehole.
- In May 2005, NMED sent a letter (NMED 2005, 092219) requesting the Laboratory continue to collect quarterly subsurface vapor-monitoring samples from boreholes 54-15461, 54-15462, and 54-01023.
- NMED reviewed the 2007 pore-gas monitoring report and, based on packer sampling results for trichloroethene (TCE) in pore-gas samples collected before dedicated sampling equipment (FLUTe) was installed, suggested the FLUTe membrane was adsorbing VOCs (NMED 2007, 099277; NMED 2008, 100480). VOC concentrations in subsurface vapor samples were compared during the second and third quarters of FY2008 to evaluate the FLUTe system used at MDA H for those two quarters versus the packer system used from 2001 to 2006 to collect subsurface vapor samples. The results of this study are discussed in "Pilot Test Report for Comparing Packer and FLUTe Vapor-Sampling Systems at Material Disposal Area H" (LANL 2008, 103889). Pore gas was sampled using the FLUTe membrane system during the second quarter sampling event; however, the FLUTe membrane was damaged during the removal process to accommodate packer sampling for the comparison study. The membrane was sent to the manufacturer for repair before it was reinstalled for third quarter sampling activities, which were conducted as planned. During the membrane removal, the tubing was disconnected from the manifold and subsequently misaligned when it was reinstalled before third quarter FY2008 sampling activities were conducted.
- During the first quarter FY2009 (December 2008) sampling event, the field crew observed that one tube connecting the FLUTe membrane's subsurface sampling port to the surface manifold in borehole 54-15462 did not correspond to the correct fitting for that depth interval on the manifold. The borehole was sampled in the observed tubing configuration (with the exception of the 60-ft port depth, which was not sampled), and the membrane was removed following sampling. After the membrane was removed, it was determined that five of the six tubes were not connected to the correct fittings for the depth intervals on the manifold. In addition, one sampling port (60-ft depth) was not reconnected to any sample tubing at that time.
- As a result of the tubing misalignment, the samples collected from the borehole during the third and fourth quarter FY2008 sampling events and the first quarter FY2009 sampling event were assigned to the wrong depth intervals. Although the misalignment of the tubing in borehole location 54-15462 was not discovered until the first quarter FY2009 sampling event, the ambient-air values measured in the port indicated the tubing may have been disconnected in the 60-ft port depth during the fourth quarter FY2008 sampling event. Therefore, the 60-ft port depth was not sampled during the fourth quarter FY2008 and first quarter FY2009 sampling events. The 60-ft port depth was sampled during the third quarter FY2008 sampling event; however, the results are not representative of formation air at this port depth.
- Because of the problems with the tubing configuration in borehole location 54-15462, the Laboratory corrected the field documentation (sample collection logs and field notebooks) for the third and fourth quarter FY2008 sampling events and for the first quarter FY2009 sampling event.
- The Sample Management Database records were updated to correlate the results to the correct port depths sampled in borehole location 54-15462 during the third and fourth quarters of FY2008 and the first quarter of FY2009.

- Analytical results and their associated port depths were reported correctly in "Periodic Monitoring Report for Vapor-Sampling Activities at Material Disposal Area H, Solid Waste Management Unit 54-004, at Technical Area 54, Fiscal Year 2008" (LANL 2009, 105191).
- The third quarter FY2008 pore-gas results presented in "Pilot Test Report for Comparing Packer and FLUTe Vapor-Sampling Systems at Materials Disposal Area H" were incorrect (LANL 2008, 103889). The information presented in this report was revised, and the report was resubmitted to NMED in February 2009 as "Pilot Test Report for Comparing Packer and FLUTe Vapor-Sampling Systems at Materials Disposal Area H, Revision 1" (LANL 2009, 105076).
- Although pore-gas screening and analytical data for borehole 54-15462 reported for the third and fourth quarters of FY2008 and the first quarter of FY2009 were corrected in all field and laboratory documentation to correlate the results to the actual depths monitored, NMED rejected all data for this borehole collected during these three events because the misalignment of the sampling ports to the manifold may have resulted in inadequate purge volumes (NMED 2009, 105599).
- On August 20, 2009, NMED sent a letter to the Laboratory discussing the presence of VOCs and tritium in the subsurface at MDA H, discrepancies between Tables 3.0-1 and 5.2-1 (LANL 2009, 106656), and the rejection of tritium in the third and fourth quarters of FY2008 and the first quarter of FY2009 because of inadequate purge times. The discrepancies were corrected, and the tables were resubmitted. The Laboratory rejected the VOC sampling results because the purge time for the three quarters was not adequate. The Laboratory includes the tritium data NMED rejected because tritium analysis is dependent on weight accumulation of water vapor, not on purge time (NMED 2009, 106786).
- On June 23, 2009, NMED sent a letter directing the Laboratory to extend the depth of existing monitoring well 54-15462 to its original intended depth of 300 ft bgs and to replace the FLUTe system with a stainless steel tubing system. The letter also directed that a new borehole 54 609985 be drilled north of shafts 4 and 9 to a depth of 300 ft bgs and finished with a stainless steel tubing system. Additionally, the letter directed that the FLUTe system in borehole 54-01023 be replaced with a stainless steel tubing system (NMED 2009, 106234).
- Drilling mobilization began on November 3, 2009. Drilling of borehole 54-609985 began on November 5, 2009, and was completed on November 13, 2009, when the stainless-steel sampling system was installed. Redrilling of borehole 54-01023 to its original intended depth of 260 ft began on November 14, 2009, and was completed on November 15, 2009, with a stainless-steel sampling system. Deepening of borehole 54-15462 to a depth of 300 ft bgs began on November 16, 2009, and was completed with a stainless-steel sampling system on November 18, 2009. Installation of the stainless-steel sampling system at borehole 54-15461 began on November 18, 2009, and was completed on November 19, 2009 (LANL 2009, 108298).

Subsurface vapor-field screening and sampling are being performed to characterize VOC concentration and tritium-activity level trends in subsurface vapor over time. Field-screening data and analytical laboratory results for the first quarter of FY2010 and the previous three quarters are presented in this monitoring report.

2.0 SCOPE OF ACTIVITIES

The following sampling activities were completed at MDA H during the first quarter of FY2010, as directed by NMED in a June 23, 2009, letter to the Laboratory (NMED 2004, 092217). First quarter vapor-monitoring activities were conducted from December 1 to December 16, 2009. Table 1.0-2 shows the vapor-monitoring borehole identification numbers and sampling port depths. The vapor-monitoring borehole locations are shown in Figure 1.0-2.

- Each sampling interval was purged to ensure that formation air was sampled in accordance with Standard Operating Procedure EP-ERSS-SOP-5074, Sampling of Sub-Atmospheric Air.
- Pore gas from each sampling interval was field screened for carbon dioxide (CO2) and oxygen (O2) using a Landtec GEM-500. A Brüel and Kjær (B&K) Type 1302 multigas photoacoustic analyzer was used to field screen for selected VOCs, CO2, and water vapor. The pressure differential was also measured at each sampling interval using a manometer.
- Vapor samples were collected from each sampling interval in SUMMA canisters for laboratory analyses of VOCs using U.S. Environmental Protection Agency (EPA) Method TO-15.
- Tritium samples were collected from each sampling interval with silica-gel columns for laboratory analysis using EPA Method 906.0.
- A total of 28 VOC samples were collected from 28 ports in four boreholes.
- A total of 28 tritium samples were collected from 28 ports in four boreholes.

No investigation-derived waste was generated during quarterly monitoring.

3.0 REGULATORY CRITERIA

The Compliance Order on Consent (the Consent Order) does not identify any cleanup standards, risk-based screening levels (SLs), risk-based cleanup goals, or other regulatory criteria for pore gas at MDA H. Therefore, an analysis was conducted to evaluate the potential for contamination of groundwater by VOCs in pore gas using SLs based on groundwater cleanup levels in the Consent Order. The analysis evaluated the groundwater concentrations that would be in equilibrium with the maximum pore gas concentrations of the VOCs detected at MDA H, if the pore gas were in equilibrium with groundwater, during the most recent round of monitoring. The equilibrium relationship between air and water concentrations is described by the following equation.

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

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

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

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

If the predicted concentration of a particular VOC in groundwater is less than the SL, then no potential exists for exceedances of groundwater cleanup levels. The analysis of the first quarter MDA H VOC pore-gas data is presented in section 5.0.

Because there are no SLs for pore gas that address the potential for groundwater contamination, the screening evaluation was based on groundwater standards or tap water SLs and on 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, 106420) or the EPA regional screening tables (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/params_sl_table_bwrun_DECEMBER2009.pdf) The following dimensionless form of Henry's law constant was used:

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

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

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

where C_{air} is the concentration of a particular VOC in the pore-gas sample (µg/m^3), H' is the dimensionless Henry's law constant, SL is the screening level (µg/L), and 1000 is a conversion factor from L to m^3. The SLs are the groundwater standards or tap water SLs. The groundwater standards are the EPA maximum contaminant level (MCL) or New Mexico Water Quality Control Commission (NMWQCC) groundwater standard, whichever is lower. If no MCL or NMWQCC standard is available, the EPA regional tap water SL (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_sl_table_bwrun_DECEMBER2009.pdf) is used and adjusted to 10^{-5} risk for carcinogens. The numerator in Equation 3.0-3 is the actual concentration of the VOC in pore gas, and the denominator represents the pore-gas concentration needed to exceed the SL. Therefore, if the SV is less than 1, the concentration of the VOC in pore gas does not exceed the SL, even if the VOC plume were in direct contact with groundwater. Table 3.0-1 presents the calculated concentrations in pore gas corresponding to groundwater SLs for contaminants detected during the first quarter of FY2010 and the previous three quarters. Table 3.0-2 shows the SVs calculated for the maximum detected VOC concentrations during first quarter FY2010. Table 3.0-3 shows the SVs calculated for the maximum detected VOC concentrations during the first quarter of FY2010 and the previous three quarters.

4.0 FIELD-SCREENING RESULTS

First quarter FY2010 vapor-monitoring field-screening activities were conducted at MDA H from December 1 to December 4, 2009. Before sampling, each sample interval was purged to ensure formation air was collected. The vapor from each port was field screened using a Landtec GEM-500 photoionization detector equipped with an 11.7-electron volt lamp to measure percent CO_2 and O_2. Each interval was monitored with the Landtec until CO_2 and O_2 readings stabilized. The stabilized percent CO_2 and O_2 values measured at each sampling location during the first quarter of FY2010 and the previous three quarters are provided in Table 4.0-1. After the tubing was purged and stabilized, VOC field-screening results were collected using a B&K Type 1302 multigas photoacoustic analyzer to estimate VOC concentrations. The B&K was calibrated for analysis of four VOCs, including trichlorofluoromethane (Freon-11); tetrachloroethene (PCE); 1,1,1-trichloroethane (TCA); and TCE. It also measured CO_2 and water vapor. The stabilized B&K field-monitoring values measured at each sampling location for the first quarter of FY2010 and the previous three quarters at each sampling location are provided in Table 4.0-2. The field-screening quality assurance/quality control (QA/QC) program is summarized in Appendix B, section B-5.0.

5.0 ANALYTICAL DATA RESULTS

First quarter FY2010 vapor-sampling activities were conducted at MDA H from December 1 to December 16, 2009. Sampling locations and depths are provided in Table 1.0-2. Analytical vapor samples were collected in SUMMA canisters and submitted for laboratory analyses of VOCs according to EPA Method TO-15. Analytical vapor samples were collected in silica gel columns and submitted for laboratory analyses of tritium according to EPA Method 906.0. Table 5.0-1 presents analytical results for detected VOCs in samples collected during the first quarter of FY2010 and the three previous quarters. Detected VOC concentrations for the first quarter of FY2010 are shown on Plate 1. Table 5.0-2 presents analytical results for detected activity levels of tritium in samples collected during the first quarter of FY2010 and the three previous quarters. Detected tritium activity levels for the first quarter of FY2010 are shown in Figure 5.0-1. Analytical data and reports for the first quarter FY2010 and the three previous quarters are included in Appendix C (on CD included with this report). Tritium and VOC analytical data were reviewed in accordance with the QA/QC program presented in Appendix B.

5.1 Data Summary

Boreholes 54-01023 and 54-15462 were redrilled in November and December of 2009, and the sampling interval increased from 2- to 5-ft intervals. These 5-ft intervals occur in the same stratigraphic unit as the previous 2-ft sampling intervals; therefore, the results from first quarter FY2010 can be compared with the previous three sampling events in FY2009.

During the first quarter of FY2010, laboratory analysis detected 24 VOC analytes in the 28 vapor samples collected from MDA H. Dichlorodifluoromethane and Freon-11 were detected in all 28 samples. TCA was detected in 27 of the 28 samples. Trichloro-1,2,2-trifluoroethane[1,1,2-] was detected in 18 samples as was chloroform. Cyclohexane was detected in 16 samples. TCE was detected in nine samples, and carbon disulfide and carbon tetrachloride were each detected in seven samples. Dichloropropane[1,2-] and toluene were each detected in six samples. Acetone, chlorodifluoromethane, and xylene[1,3]+xylene[1,4] were each detected in five VOC samples. Butanone[2-] and PCE were each detected in four samples. Benzene, ethylbenzene, and propylene were each detected in three samples. Bromodichloromethane, hexane, and n-heptane were detected each in two samples. Dichloroethane[1,1-] and ethyl toluene[4-] were each detected in one sample.

Cyclohexane was detected once in the previous three sampling events at MDA H: in the first quarter of FY2010 there were three detections of cyclohexane at borehole 54-01023, six at 54-15462 and seven detects at borehole 54-609985. Chloroform was not detected in the previous three sampling events but was detected during the latest sampling round in one sample from borehole 54-01023, all nine samples from 54-15462, and eight of the nine samples from the newly drilled borehole 54-609985.

Thirteen VOC analytes were detected in the seven vapor samples collected from 54-01023; Freon-11 and dichlorodifluoromethane were detected in all seven samples at concentrations similar to those of the three previous sampling events. TCA was detected in six samples at concentrations similar to those of the first and fourth quarters of FY2009. Trichloro-1,2,2-trifluoroethane[1,1,2-], cyclohexane, and carbon disulfide were each detected in three of the seven VOC samples. The highest VOC detection at 54-01023 during first quarter FY2010 was chloroform at a concentration of 200 $\mu g/m^3$ (41 ppbv) at a depth of 12.5 ft bgs. Chlorobenzene and butanol [2-] were detected during the previous three sampling events at borehole 54-01023 but were not detected during the first quarter of FY2010.

Five VOC analytes were detected in the three soil vapor samples taken from borehole 54-15461, including dichlorodifluoromethane, TCA, and Freon-11 in all three samples, at concentrations similar to those of the previous three sampling events at 54-15461. Carbon disulfide was detected in two of the three samples, and acetone was detected in one sample from borehole 54-15461.

Seventeen VOC analytes were detected in the nine samples collected from borehole 54-15462 during first quarter FY2010. Dichlorodifluoromethane, TCA, and Freon-11 were detected in all nine samples at an average concentration twice that of the previous quarter. Chloroform was detected in all nine samples with a minimum concentration of 360 $\mu g/m^3$ (74 ppbv) at 260.5 ft bgs to a maximum concentration of 1400 $\mu g/m^3$ (290 ppbv) at 152.5 ft bgs. Chloroform was not detected in the previous three sampling quarters. Cyclohexane was detected once in the previous three sampling events and was detected in six samples from borehole 54-15462, with a maximum concentration of 30 µg/m^3 (8.8 ppbv). PCE was not detected in the previous three quarters but was detected in the first quarter FY2010 at concentrations ranging from 5.8 µg/m^3 to 7.6 µg/m^3 (0.85 ppbv to 1.1 ppbv). TCE and xylene[1,3]+xylene[1,4] were detected at concentrations similar to those in the previous three sampling quarters. During the second quarter FY2009, toluene was detected at concentrations as high as 1000 µg/m^3 (280 ppbv), but it was detected in only two samples at concentrations just above the method detection limit (MDL) during first quarter FY2010.

Twenty-one VOC analytes were detected in nine samples taken from the newly drilled borehole 54-609985 just north of MDA H during the first quarter FY2010. All nine samples had detectable concentrations of dichlorodifluoromethane, TCA, and Freon-11. Concentrations of dichlorodifluoromethane ranged from 6.1 µg/m^3 (1.2 ppbv) to 45 µg/m^3 (9.2 ppbv), with the highest concentration at the 202.5 ft depth. TCA was detected at concentrations ranging from 9.1 µg/m^3 (1.7 ppbv) to 47 µg/m^3 (8.6 ppbv). Freon-11 was detected at a minimum concentration of 4.8 µg/m^3 (0.86 ppbv) at a depth of 6.5 ft bgs and a maximum concentration of 45 µg/m^3 (8 ppbv) at 62.5 ft bgs; its concentrations decreased with depth. Eight samples had detectable concentrations of both chloroform and trichloro-1,2,2-trifluoroethane[1,1,2-]. Chloroform was detected at a maximum concentration of 270 µg/m^3 (55 ppbv) at the 202.5-ft-bgs. Trichloro-1,2,2-trifluoroethane-[1,1,2] was detected in concentrations ranging from 10 µg/m^3 to 19 µg/m^3 (1.4 ppbv to 2.5 ppbv). Cyclohexane was detected in seven of the nine samples collected at borehole 54-609985 and increased with depth from 3.2 µg/m^3 to 81 µg/m^3 (0.94 ppbv to 24 ppbv). Carbon tetrachloride was detected in seven of nine samples with a maximum concentration of 19 µg/m^3 (3.1 ppbv). TCE and dichloropropane-[1,2-] were each detected in four samples at maximum concentrations of 6 µg/m^3 (1.1 ppbv) and 5.7 µg/m^3 (1.2 ppbv), respectively. Toluene was detected in three samples while acetone, benzene, hexane, n-heptane, and xylene[1,3]+xylene[1,4] were detected in two samples.

The highest VOC concentration detected in the first quarter of FY2010 was chloroform at 1400µg/m^3 (290 ppbv) at borehole 54-15462 at 152.5 ft bgs, with the next highest chloroform concentration detected at 820 µg/m^3 (170 ppbv) at borehole 54-15462 at 62.5 ft bgs. The lowest concentration of chloroform at 4.8µg/m^3 (0.98 ppbv) was detected at borehole 54-609985 at 152.5 ft bgs. Chloroform was not detected in the previous three sampling quarters of FY2009. The highest concentrations of TCA, TCE, and PCE were detected at borehole 54-15462. TCA was detected at a concentration of 91 µg/m^3 (17 ppbv) at a depth of 62.5 ft bgs, TCE was detected at 6.5 µg/m^3 (1.2 ppbv) at a depth of 102.5 ft bgs, and PCE was detected at a concentration of 7.6 µg/m^3 (1.1 ppbv) at a depth of 62.5 ft bgs. The highest concentration of Freon-11 was detected in borehole 54-01023 at a concentration of 65 µg/m^3 (12 ppbv) at a depth of 62.5 ft bgs.

During the first quarter FY2010 sampling event, tritium was detected in 11 of the 28 vapor samples collected at MDA H with activity levels ranging from 1043.86 pCi/L to 398879 pCi/L. The tritium activity levels detected at borehole 54-01023 in first quarter FY2010 were, on average, 10 times less than those detected in the previous three sampling events. The highest tritium activity levels were detected in vapor samples collected from borehole location 54-01023, the monitoring borehole nearest MDA H. Tritium activity levels, in the top four ports of 54-01023, from 12.5 to 152.5 ft bgs, ranged from 132499 pCi/L to 398879 pCi/L. There was a drop of 2 orders of magnitude in the activity level at the 202.5-ft-bgs depth. The tritium activity level increased at the bottommost sampling depth, with a result of 104,258 pCi/L. The 260.5-ft-bgs sampling depth had not been sampled previously because borehole 54-01023 had been deepened and this port was sampled for the first time during the first quarter FY 2010. Tritium activity levels at borehole 54-01023 were generally 1 order of magnitude lower than the tritium activities detected during the previous three sampling events. Tritium activity levels in boreholes 54-15461 and 54-15462 ranged from 1043.86 to 3037.27 pCi/L and were of the same order of magnitude as the three previous sampling events. Tritium was not detected in newly drilled borehole 54-609985.

5.2 Data Evaluation

The VOC results from the first quarter of FY2010 were screened to evaluate whether the concentrations of VOCs are a potential source of groundwater contamination. Because there are no SLs for pore gas that address the potential for groundwater contamination, the screening evaluation was based on groundwater standards or tap water SLs and Henry's law constants that describe the equilibrium relationship between vapor and water concentrations (see section 3.0).

SVs were calculated for the maximum concentrations of VOCs detected at MDA H using Equation 3.0-3 during the first quarter of FY2010, and 24 VOCs were detected. The evaluation included the 21 VOCs detected in MDA H samples for which there are MCLs, NMWQCC standards, or EPA regional tap water SLs. Table 3.0-2 presents the SVs calculated for the relevant VOCs for first quarter FY2010. SVs were less than 1.0 for all detected VOCs, indicating VOC concentrations in the pore gas beneath MDA H are not an immediate potential threat to groundwater.

SVs were calculated using Equation 3.0-3 for the maximum concentrations of VOCs detected in pore-gas samples at MDA H during the first quarter of FY2010 and the previous three quarters of FY2009, and 34 VOCs were detected. The evaluation included the 28 VOCs detected for which MCLs, NMWQCC standards, or EPA regional tap water SLs are available. Table 3.0-3 presents the SVs calculated for the relevant VOCs for the previous three quarters of FY2009 and first quarter of FY2010. All SVs were below 1.0 for the last four quarters, indicating VOC concentrations in the pore gas beneath MDA H are not an immediate potential threat to groundwater.

6.0 SUMMARY

The purpose of the quarterly pore-gas monitoring activities at MDA H is to evaluate trends in VOC concentrations and tritium activities in subsurface vapor at MDA H over time. The results from the first quarter FY2010 monitoring event are summarized below.

- During FY2010, 24 VOC analytes were detected in vapor samples collected from the monitoring boreholes at MDA H. Thirteen of these VOCs were detected in vapor samples collected from borehole location 54-01023, 5 were detected in samples from borehole location 54-15461, 17 were detected in samples from borehole location 54-15462, and 21 were detected in the newly drilled borehole 54-609985.
- Maximum concentrations of all VOCs detected in pore gas during first quarter FY2010 as well as the previous three sampling events were less than concentrations needed to exceed groundwater SLs. The VOCs detected at MDA H monitoring locations pose no immediate potential threat to groundwater.
- VOCs were present at low concentrations (≤1400 µg/m3 or ≤290 ppbv) in subsurface vapor and are generally consistent with concentrations detected during the three previous quarterly sampling events.
- Three VOC analytes were detected in vapor samples at all three borehole locations every quarter and at the new borehole during the first quarter FY2010 event: dichlorofluoromethane, Freon-11, and TCA. Trichloro-1,2,2-trifluoroethane[1,1,2] was also detected in more than half the vapor samples collected from borehole locations 54-01023 and 54-15462 during the year.

- Maximum detected concentrations of VOC analytes were present in borehole 54-15462 at the 152.5-ft port depth. VOC concentrations varied but were generally within the same order of magnitude at each borehole location. Butanol[1-] and chlorobenzene were not detected in vapor samples collected during the first quarter of FY2010 but were detected during the previous three quarters. Bromodichloromethane, chlorodifluoromethane, and chloroform were detected in vapor samples collected during the first quarter of FY2010 but were not detected in samples from the previous three quarters.
- Tritium in pore vapor was detected in 11 samples analyzed during the first quarter of FY2010; the activity levels in borehole locations 54-15461 and 54-15462 are generally consistent with those detected during the three previous quarterly sampling events. The tritium activity levels in borehole location 54-01023 decreased, on average, by 1 order of magnitude from fourth quarter FY2009 levels. Tritium activities decreased laterally within a short distance from MDA H. Tritium activity levels in borehole location 54-01023 generally decreased with depth. Borehole 54-01023 was deepened, and the port at 260.5 ft bgs was sampled for the first time during the first quarter FY 2010. Tritium levels were higher at this port than at the two sampling intervals above. Tritium activity levels at boreholes 54-15461 and 54-15462 were consistent with those from the previous three sampling quarters.
- No tritium activity was detected in the newly drilled borehole 54-609985.

7.0 REFERENCES AND MAP DATA SOURCES

7.1 References

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

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

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NMED (New Mexico Environment Department), August 2009. "Technical Background Document for Development of Soil Screening Levels, Revision 5.0," New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2009, 106420)

NMED (New Mexico Environment Department), August 20, 2009. "Review of the 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 2009," 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, 106786)

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	Data Source
Disposal pit	Waste Storage Features; LANL, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2007-0032; 1:2,500 Scale Data; 13 April 2007.
Disposal shaft	Waste Storage Features; LANL, Environment and Remediation Support Services Division, GIS/Geotechnical Services Group, EP2007-0032; 1:2,500 Scale Data; 13 April 2007.
Elevation contour	Hypsography, 10, 20, & 100 Foot Contour Intervals; LANL, ENV Environmental Remediation and Surveillance Program; 1991.
Fence	Security and Industrial Fences and Gates; LANL, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
LANL boundary	LANL Areas Used and Occupied; LANL, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 October 2008.
MDA	Materials Disposal Areas; LANL, ENV Environmental Remediation and Surveillance Program; ER2004-0221; 1:2,500 Scale Data; 23 April 2004.
Paved road	Paved Road Arcs; LANL, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
Structure	Structures; LANL, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
TA boundary	Technical Area Boundaries; LANL, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007.

Legend Item	Data Source
Unpaved road	Dirt Road Arcs; LANL, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 10 September 2007.
Vapor-monitoring well	Point Feature Locations of the Environmental Restoration Project Database; LANL, Environment and Remediation Support Services Division, EP2007-0754; 30 November 2007.

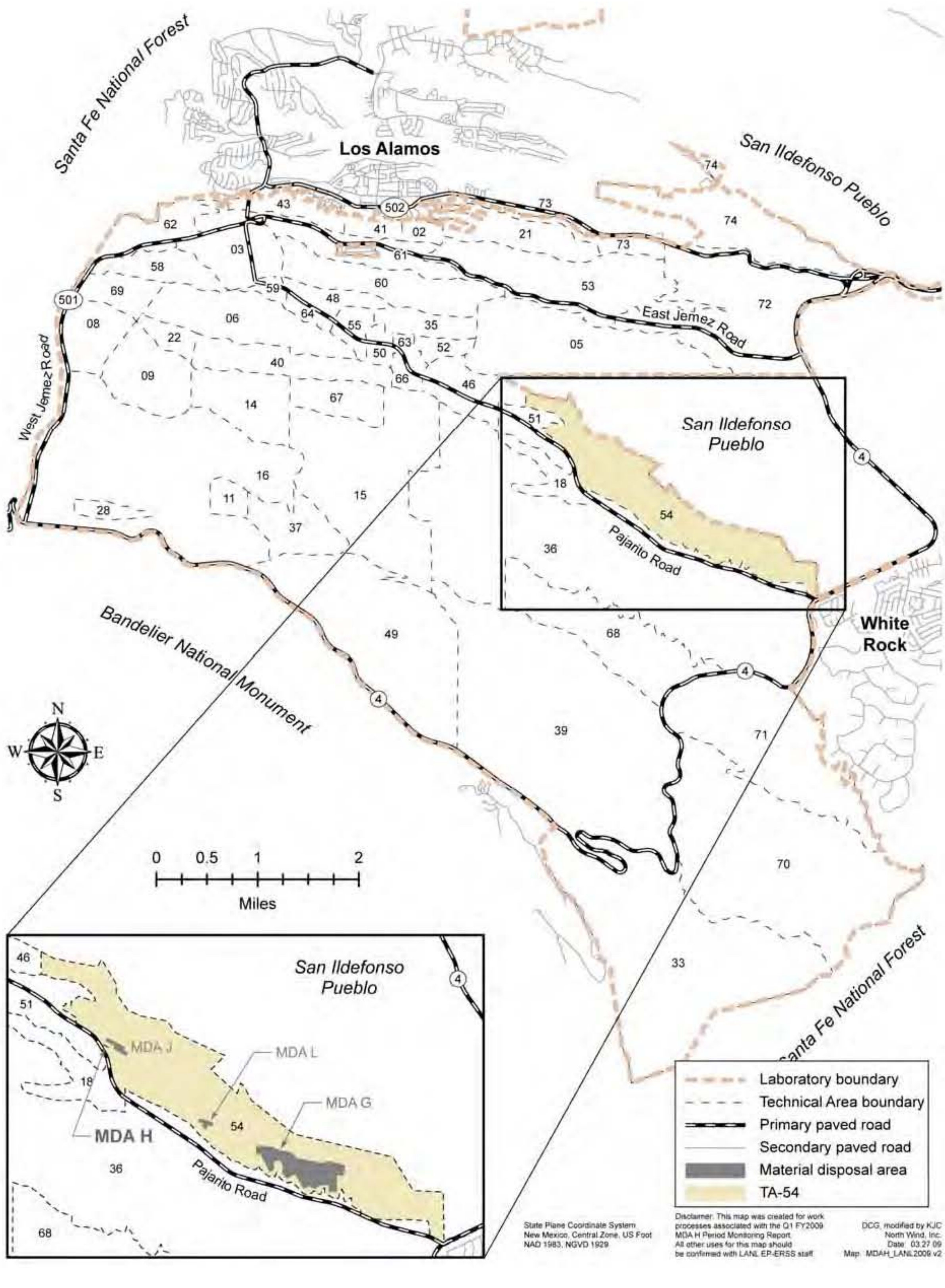

Figure 1.0-1 Location of MDA H in TA-54 with respect to Laboratory TAs and surrounding land holdings

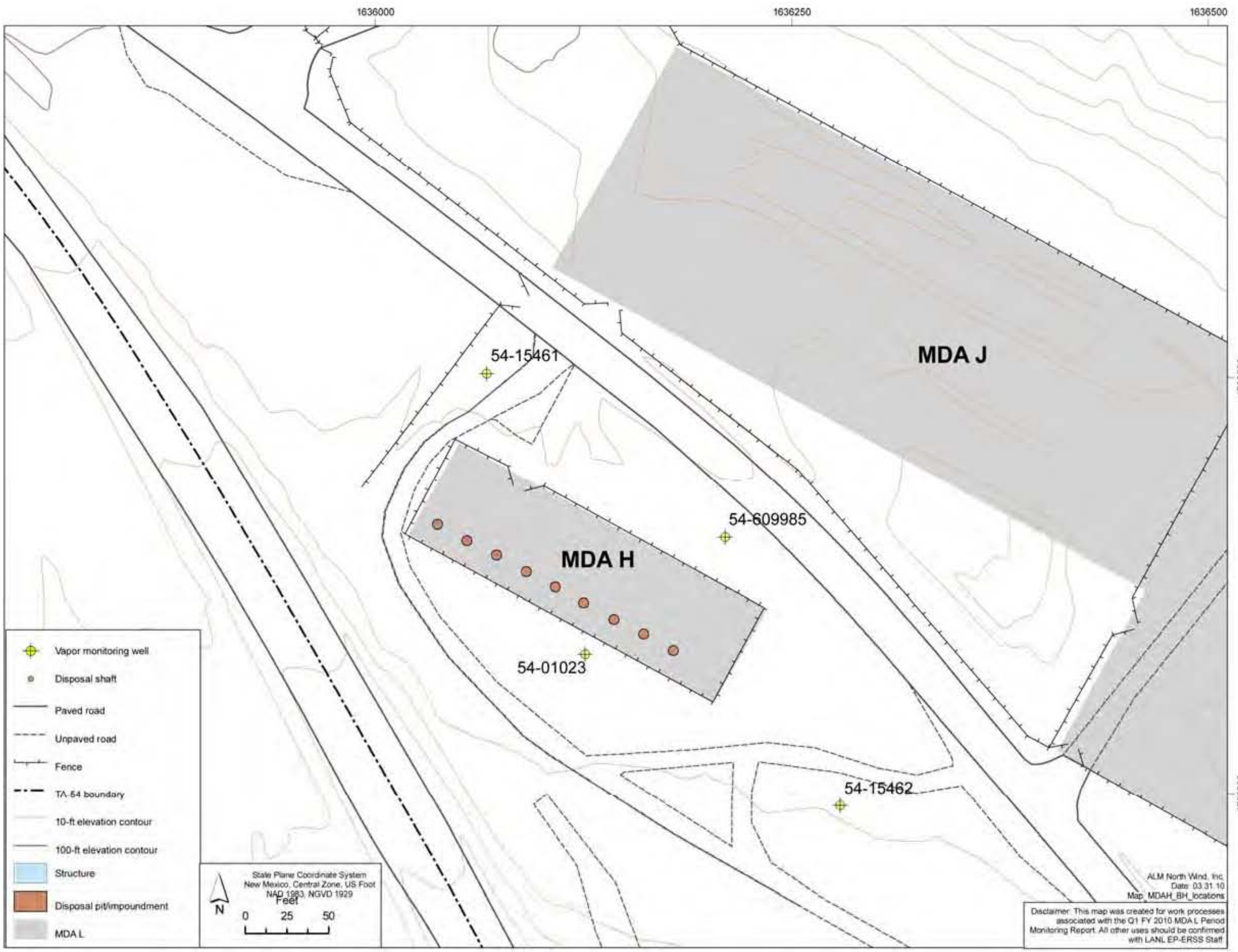

Figure 1.0-2 Locations of MDA H pore-gas monitoring boreholes

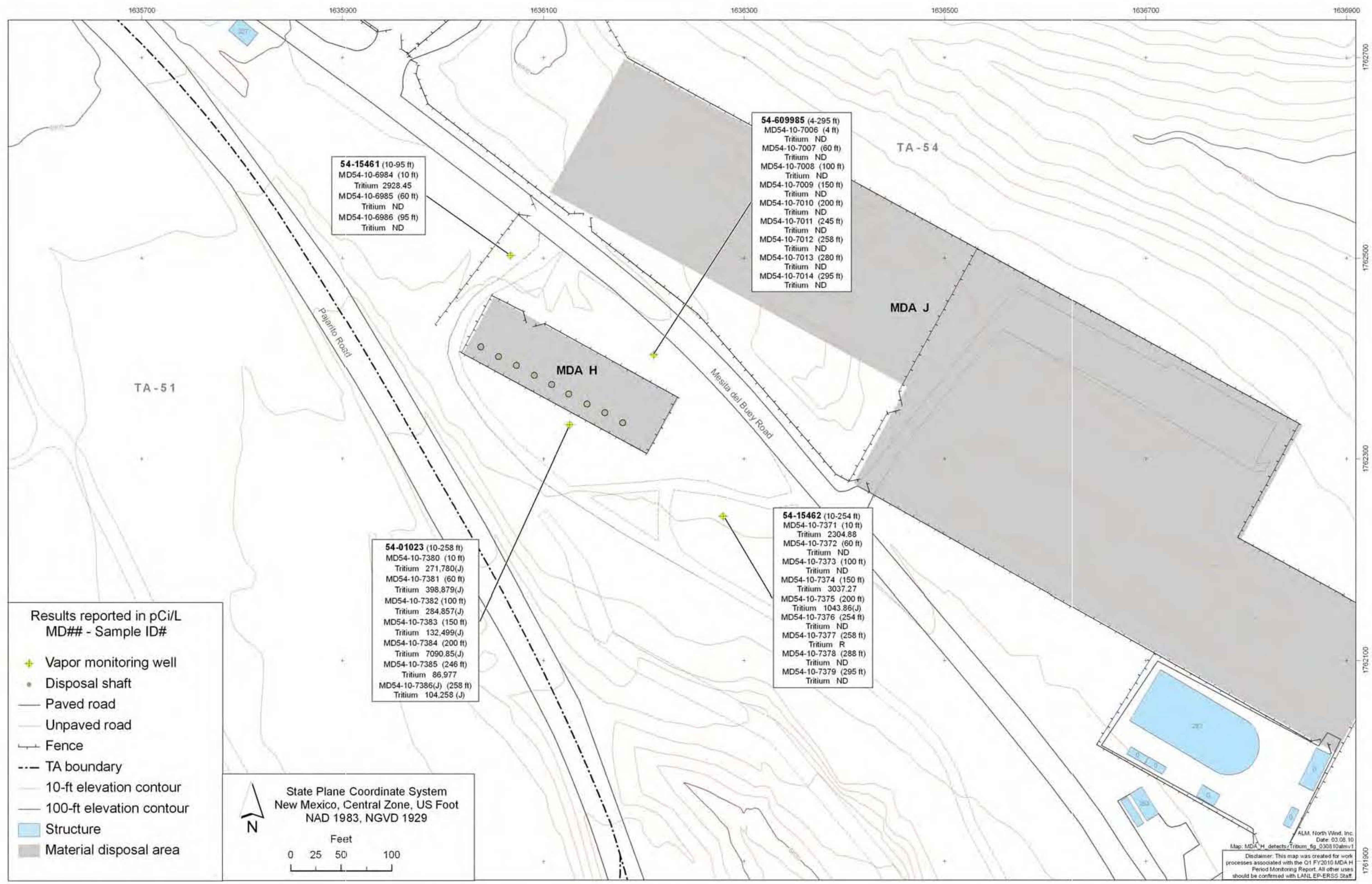

Figure 5.0-1 Tritium detected in vapor samples at MDA H

Table 1.0-1
NMED-Approved MDA H Subsurface Vapor-Monitoring Locations, Port Depths, and Corresponding Sampling Intervals through Fourth Quarter FY2009

Borehole ID	VOC and Tritium Sampling Port Depth Intervals (ft bgs)
54–01023	10 (10–12), 60 (60-62), 100 (100–102), 150 (150–152), 200 (200–202), 247 (247–249)
54–15461	10 (10–12), 60 (60-62), 95 (95–97)
54–15462	10 (10–12), 60 (60–62), 100 (100–102), 150 (150–152), 200 (200–202), 254 (254–256)

Notes: Depths denote locations where VOC and tritium samples are to be collected. Sampling intervals are given in parentheses.

Table 1.0-2
NMED-Approved MDA H Subsurface Vapor-Monitoring Locations, Port Depths, and Corresponding Sampling Intervals Effective First Quarter FY2010

Borehole ID	VOC and Tritium Sampling Port Depth Intervals (ft bgs)
54–01023[a]	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[a]	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[b]	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)

Notes: Depths denote locations where VOC and tritium samples are to be collected. Sampling intervals are given in parentheses.

[a] Borehole was redrilled November 2009, depths reflect new ports and intervals.

[b] New borehole location was drilled in November 2009.

Table 3.0-1
Henry's Law Constants, Groundwater SLs, and Calculated Pore Gas Concentrations Corresponding to Groundwater SLs for VOCs Detected in Pore Gas at MDA H during Last Four Quarters

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater SL (µg/L)	Source of Groundwater SL	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)
Acetone	0.0016	22,000	EPA Regional SL	35,200
Benzene	0.228	5	EPA MCL	1140
Bromodichloromethane	0.087	0.12	EPA Regional SL	10.44
Butanol[1-]	0.00036	3700	EPA Regional SL	1332
Butanone[2-]	0.0023	7100	EPA Regional SL	16,330
Carbon Disulfide	0.59	1000	EPA Regional SL	590,000
Carbon Tetrachloride	1.1	5	EPA MCL	5500
Chlorobenzene	0.13	100	EPA MCL	13,000
Chlorodifluoromethane	1.7	100,000	EPA Regional SL	170,000,000
Chloroform	0.15	100	NMWQCC	15,000
Cyclohexane	6.1	13,000	EPA Regional SL	79,300,000
Dichlorobenzene[1,4-]	0.0996	75	EPA MCL	7470
Dichlorodifluoromethane	14	390	EPA Regional SL	5,460,000
Dichloroethane[1,1-]	0.23	25	NMWQCC	5750
Dichloroethene[1,1-]	1.1	5	NMWQCC	5500
Dichloropropane[1,2-]	0.12	5	EPA MCL	600
Ethanol	na[b]	na	na	na
Ethylbenzene	0.323	700	EPA MCL	226,100
Ethyltoluene[4-]	na	na	na	na
Hexane	74	880	EPA Regional SL	65,120,000
Methanol	0.00019	18,000	EPA Regional SL	3420
Methylene Chloride	0.13	5	EPA MCL	650
n-Heptane	na	na	na	na
Propanol[2-]	0.00033	na	na	na
Propylene	na	na	na	na
Tetrachloroethene	0.72	5	EPA MCL	3600
Tetrahydrofuran	na	na	na	na
Toluene	0.272	750	NMWQCC	204,000
Trichloro-1,2,2-trifluoroethane[1,1,2-]	22	59,000	EPA Regional SL	1,298,000,000
Trichloroethane[1,1,1-]	0.705	60	NMWQCC	42,300
Trichloroethene	0.4	5.0	EPA MCL	2000

Table 3.0-1 (continued)

VOC	Henry's Law Constant[a] (dimensionless)	Groundwater SL (µg/L)	Source of Groundwater SL	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)
Trichlorofluoromethane	4	1300	EPA Regional SL	5,200,000
Xylene[1,2-]	0.213	1200	EPA Regional SL	255,600
Xylene[1,3-]+Xylene[1,4-]	0.27	10,000[c]	EPA MCL	2,700,000

Notes: Calculated concentrations in pore gas exceeding groundwater standard derived from the denominator of Equation 3.0-3. The SV is derived from Equation 3.0-3.

[a] NMED 2009, 106420, Appendix B.

[b] na = Not available.

[c] SL for xylene[1,3-]+xylene[1,4-] is for xylene mixture.

Table 3.0-2
Screening of VOCs Detected in Pore Gas at MDA H during First Quarter FY2010

VOC	Maximum Detected Pore-Gas Concentration (µg/m³)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)	SV (unitless)	Potential to Exceed Groundwater Standard[a]
Acetone	14	35,200	0.0004	No
Benzene	14	1140	0.012	No
Bromodichloromethane	6.9	10.44	0.66	No
Butanone[2-]	10	16,330	0.00061	No
Carbon Disulfide	14	590,000	0.000024	No
Carbon Tetrachloride	19	5500	0.0035	No
Chlorodifluoromethane	20	170,000,000	0.00000012	No
Chloroform	1400	15,000	0.093	No
Cyclohexane	81	79,300,000	0.000001	No
Dichlorodifluoromethane	45	5,460,000	0.0000082	No
Dichloroethane[1,1-]	3.5	5750	0.00061	No
Dichloropropane[1,2-]	5.7	600	0.0095	No
Ethylbenzene	4.2	226,100	0.000019	No
Ethyltoluene[4-]	4.5	na[b]	na	No
Hexane	16	65,120,000	0.00000025	No
n-Heptane	17	na	na	No
Propylene	8.6	na	na	No
Tetrachloroethene	7.6	3600	0.0021	No
Toluene	8	204,000	0.000039	No

Table 3.0-2 (continued)

VOC	Maximum Detected Pore-Gas Concentration (µg/m3)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m3)	SV (unitless)	Potential to Exceed Groundwater Standard[a]
Trichloro-1,2,2-trifluoroethane[1,1,2-]	22	1,298,000,000	0.000000017	No
Trichloroethane[1,1,1-]	91	42,300	0.0022	No
Trichloroethene	6.5	2000	0.0033	No
Trichlorofluoromethane	65	5,200,000	0.000013	No
Xylene[1,3-]+Xylene[1,4-]	6.5	2,700,000	0.0000024	No

Note: Calculated concentrations in pore gas corresponding to groundwater SLs derived from denominator of Equation 3.0-3.

[a] If the SV is less than 1, the concentration of the VOC in pore gas does not exceed the groundwater SL and the VOC is not a threat to groundwater.

[b] na = Not available.

Table 3.0-3
Screening of VOCs Detected in Pore Gas at MDA H during the Last Four Quarters

VOCs	Maximum Pore-Gas Concentration (µg/m3)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m3)	SV (unitless)	Potential to Exceed Groundwater Standard[a]
Acetone	720	35,200	0.02	No
Benzene	16	1140	0.014	No
Bromodichloromethane	6.9	10.44	0.66	No
Butanol[1-]	600	1332	0.45	No
Butanone[2-]	25	16,330	0.0015	No
Carbon Disulfide	28	590,000	0.000047	No
Carbon Tetrachloride	19	5500	0.0035	No
Chlorobenzene	110	13,000	0.0085	No
Chlorodifluoromethane	20	170,000,000	0.00000012	No
Chloroform	1400	15,000	0.093	No
Cyclohexane	81	79,300,000	0.000001	No
Dichlorobenzene[1,4-]	6.9	7470	0.00092	No
Dichlorodifluoromethane	45	5,460,000	0.0000082	No
Dichloroethane[1,1-]	3.5	5750	0.00061	No
Dichloroethene[1,1-]	16	5500	0.0029	No
Dichloropropane[1,2-]	5.7	600	0.0095	No
Ethanol	60	na[b]	na	No
Ethylbenzene	5.8	226,100	0.000026	No
Ethyltoluene[4-]	4.5	na	na	No

Table 3.0-3 (continued)

VOCs	Maximum Pore-Gas Concentration (µg/m³)	Calculated Concentrations in Pore Gas Corresponding to Groundwater Standard (µg/m³)	SV (unitless)	Potential to Exceed Groundwater Standard[a]
Hexane	16	65,120,000	0.00000025	No
Methanol	250	3420	0.073	No
Methylene Chloride	6.1	650	0.0094	No
n-Heptane	17	na	na	No
Propanol[2-]	410	na	na	No
Propylene	18	na	na	No
Tetrachloroethene	9	3600	0.0025	No
Tetrahydrofuran	17	na	na	No
Toluene	1000	204,000	0.0049	No
Trichloro-1,2,2-trifluoroethane[1,1,2-]	25	1,298,000,000	0.000000019	No
Trichloroethane[1,1,1-]	91	42,300	0.0022	No
Trichloroethene	10	2000	0.005	No
Trichlorofluoromethane	75	5,200,000	0.000014	No
Xylene[1,2-]	10	255,600	0.000039	No
Xylene[1,3-]+Xylene[1,4-]	15	2,700,000	0.0000056	No

Note: Calculated concentrations in pore gas corresponding to groundwater SLs derived from denominator of Equation 3.0-3. The SV is derived from Equation 3.0-3.

[a] If the SV is less than 1, the concentration of the VOC in pore gas does not exceed the groundwater SL and the VOC is not a threat to groundwater.

[b] na = Not available.

Table 4.0-1
Field-Screening Results Using a Landtec GEM-500 at MDA H

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-01023	Ambient	Ambient	CO_2	3/11/09	0.6	4/30/09	0	8/5/09	0	12/2/09	0
			O_2	3/11/09	21.4	4/30/09	21.7	8/5/09	21.2	12/2/09	20.5
	10	10–12	CO_2	3/11/09	0.8	4/30/09	0.2	8/5/09	0.5	NS*	NS
			O_2	3/11/09	21.1	4/30/09	21.3	8/5/09	19.9	NS	NS
	12.5	10–15	CO_2	NS	NS	NS	NS	NS	NS	12/2/09	0.4
			O_2	NS	NS	NS	NS	NS	NS	12/2/09	20.2
	60	60–62	CO_2	3/11/09	1	4/30/09	0.4	8/5/09	0.3	NS	NS
			O_2	3/11/09	21	4/30/09	21.1	8/5/09	19.9	NS	NS
	62.5	60–65	CO_2	NS	NS	NS	NS	NS	NS	12/2/09	0.7
			O_2	NS	NS	NS	NS	NS	NS	12/2/09	19.6
	100	100–102	CO_2	3/11/09	1	4/30/09	0.2	8/5/09	0.3	NS	NS
			O_2	3/11/09	20.8	4/30/09	20.3	8/5/09	19.3	NS	NS
	102.5	100–105	CO_2	NS	NS	NS	NS	NS	NS	12/2/09	0.6
			O_2	NS	NS	NS	NS	NS	NS	12/2/09	19.3
	150	150–152	CO_2	3/11/09	0.9	4/30/09	0.1	8/5/09	0.1	NS	NS
			O_2	3/11/09	21	4/30/09	20.2	8/5/09	19.4	NS	NS
	152.5	150–155	CO_2	NS	NS	NS	NS	NS	NS	12/2/09	0
			O_2	NS	NS	NS	NS	NS	NS	12/2/09	19.6
	200	200–202	CO_2	3/11/09	0.8	4/30/09	0.2	8/5/09	0	NS	NS
			O_2	3/11/09	20.9	4/30/09	20	8/5/09	19.4	NS	NS
	202.5	200–205	CO_2	NS	NS	NS	NS	NS	NS	12/2/09	0.5
			O_2	NS	NS	NS	NS	NS	NS	12/2/09	19.3

Table 4.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-01023 (cont.)	247	247–249	CO_2	3/11/09	0.8	4/30/09	0.2	8/5/09	0	NS	NS
			O_2	3/11/09	21.1	4/30/09	20.1	8/5/09	19.7	NS	NS
	247.5	245–250	CO_2	NS	NS	NS	NS	NS	NS	12/2/09	0.3
			O_2	NS	NS	NS	NS	NS	NS	12/2/09	19.2
	260.5	258–263	CO_2	NS	NS	NS	NS	NS	NS	12/2/09	0.3
			O_2	NS	NS	NS	NS	NS	NS	12/2/09	19.3
54-15461	Ambient	Ambient	CO_2	3/9/09	0	4/29/09	0	8/6/09	0	12/1/09	0
			O_2	3/9/09	20.9	4/29/09	20.8	8/6/09	20.9	12/1/09	20.1
	10	10–12	CO_2	3/9/09	1	4/29/09	0.3	8/6/09	0	NS	NS
			O_2	3/9/09	20.7	4/29/09	20.7	8/6/09	20.4	NS	NS
	11	10–12	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.4
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	19.6
	60	60–62	CO_2	3/9/09	1.2	4/29/09	0.7	8/6/09	0	NS	NS
			O_2	3/9/09	20.6	4/29/09	20.6	8/6/09	20.2	NS	NS
	61	60–62	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.4
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	19.2
	95	95–97	CO_2	3/9/09	1	4/29/09	0.7	8/6/09	0	NS	NS
			O_2	3/9/09	20.7	4/29/09	20.5	8/6/09	20.1	NS	NS
	96	95–97	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.5
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	18.8
54-15462	Ambient	Ambient	CO_2	4/2/09	0	4/29/09	0	8/6/09	0	12/1/09	0
			O_2	4/2/09	21.8	4/29/09	20.8	8/6/09	21.4	12/1/09	20.6
	10	10–12	CO_2	4/2/09	0	4/29/09	0.5	8/6/09	0	NS	NS
			O_2	4/2/09	21.9	4/29/09	20.1	8/6/09	20.7	NS	NS
	12.5	10–15	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.8

Table 4.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-15462 (cont.)	12.5	10–15	O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.5
	60	60–62	CO_2	4/2/09	0	4/29/09	0.6	8/6/09	0	NS	NS
			O_2	4/2/09	21.7	4/29/09	19.4	8/6/09	20.2	NS	NS
	62.5	60–65	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.7
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.5
	100	100–102	CO_2	4/2/09	0	4/29/09	0.5	8/6/09	0	NS	NS
			O_2	4/2/09	21.7	4/29/09	19.3	8/6/09	20.1	NS	NS
	102.5	100–105	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.6
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.5
	150	150–152	CO_2	4/2/09	0	4/29/09	0.3	8/6/09	0	NS	NS
			O_2	4/2/09	21.6	4/29/09	19.6	8/6/09	19.8	NS	NS
	152.5	150–155	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.5
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.5
	200	200–202	CO_2	4/2/09	0	4/29/09	0.3	8/6/09	0	NS	NS
			O_2	4/2/09	22	4/29/09	19.8	8/6/09	19.4	NS	NS
	202.5	200–205	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.4
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.4
	247.5	245–250	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.6
	254	254–256	CO_2	4/2/09	0	4/29/09	0.2	8/6/09	0	NS	NS
			O_2	4/2/09	22.1	4/29/09	19.5	8/6/09	19.4	NS	NS
	260.5	258–263	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.1
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.5
	282.5	280–285	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.3
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.2

Table 4.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Interval (ft bgs)	Analyte	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result (%)	Date	Result (%)	Date	Result (%)	Date	Result (%)
54-15462 (cont.)	297.5	295–300	CO_2	NS	NS	NS	NS	NS	NS	12/1/09	0.2
			O_2	NS	NS	NS	NS	NS	NS	12/1/09	20.1
54-609985	Ambient	Ambient	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	20.2
	6.5	4–9	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.2
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	20.2
	62.5	60–65	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	1
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	19.5
	102.5	100–105	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.7
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	19.6
	152.5	150–155	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.6
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	19.8
	202.5	200–205	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.6
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	19.8
	247.5	245–250	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.4
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	20.2
	260.5	258–263	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.4
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	20.4
	282.5	280–285	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.4
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	20.8
	297.5	295–300	CO_2	NS	NS	NS	NS	NS	NS	12/4/09	0.3
			O_2	NS	NS	NS	NS	NS	NS	12/4/09	20.8

*NS = Not sampled.

Table 4.0-2
Field-Screening Results Using a B&K Multigas Analyzer at MDA H

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023	Ambient	Ambient	CO_2 (µg/m^3)	3/11/09	872,000	4/30/09	726,000	8/5/09	1,100,000	12/2/09	935,000
			Freon-11 (µg/m^3)	3/11/09	178	4/30/09	-1000	8/5/09	4.17	12/2/09	203
			H_2O (µg/m^3)	3/11/09	3,060,000	4/30/09	19.6[a]	8/5/09	11,000,000	12/2/09	5,140,000
			PCE (µg/m^3)	3/11/09	2690	4/30/09	-4100	8/5/09	2150	12/2/09	5170
			Pressure differential (kPa)	3/11/09	0	4/30/09	0	8/5/09	0	12/2/09	0
			TCA (µg/m^3)	3/11/09	2980	4/30/09	-1100	8/5/09	1220	12/2/09	-2200
			TCE (µg/m^3)	3/11/09	4670	4/30/09	2610	8/5/09	1530	12/2/09	3270
	10	10–12	CO_2 (µg/m^3)	3/11/09	9,470,000	4/30/09	5,060,000	8/5/09	16,500,000	NS[b]	NS
			Freon-11 (µg/m^3)	3/11/09	-482	4/30/09	253	8/5/09	-218	NS	NS
			H_2O (µg/m^3)	3/11/09	6,710,000	4/30/09	54.2[a]	8/5/09	15,100,000	NS	NS
			PCE (µg/m^3)	3/11/09	-2500	4/30/09	-1400	8/5/09	2450	NS	NS
			Pressure differential (kPa)	3/11/09	-0.03	4/30/09	0.03	8/5/09	0	NS	NS
			TCA (µg/m^3)	3/11/09	-42,000	4/30/09	-6900	8/5/09	5910	NS	NS
			TCE (µg/m^3)	3/11/09	41.7	4/30/09	-1500	8/5/09	137	NS	NS
	12.5	10–15	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	8,510,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	51.3
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	9,390,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	4290
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/2/09	0.02
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-57,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	5090

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023 (cont.)	60	60–62	CO_2 (µg/m^3)	3/11/09	15,200,000	4/30/09	6,160,000	8/5/09	11,900,000	NS	NS
			Freon-11 (µg/m^3)	3/11/09	-835	4/30/09	140	8/5/09	-173	NS	NS
			H_2O (µg/m^3)	3/11/09	7,650,000	4/30/09	59[a]	8/5/09	13,500,000	NS	NS
			PCE (µg/m^3)	3/11/09	-5900	4/30/09	-4200	8/5/09	2020	NS	NS
			Pressure differential (kPa)	3/11/09	-0.11	4/30/09	0.05	8/5/09	-0.02	NS	NS
			TCA (µg/m^3)	3/11/09	-65,000	4/30/09	-8300	8/5/09	1390	NS	NS
			TCE (µg/m^3)	3/11/09	-2500	4/30/09	-248	8/5/09	2200	NS	NS
	62.5	60–65	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	13,700,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	122
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	9,780,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3980
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/2/09	0.08
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-80,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	5790
	100	100–102	CO_2 (µg/m^3)	3/11/09	13,900,000	4/30/09	3,370,000	8/5/09	10,300,000	NS	NS
			Freon-11 (µg/m^3)	3/11/09	-923	4/30/09	-590	8/5/09	-259	NS	NS
			H_2O (µg/m^3)	3/11/09	8,030,000	4/30/09	59[a]	8/5/09	12,700,000	NS	NS
			PCE (µg/m^3)	3/11/09	-5300	4/30/09	-1900	8/5/09	-1200	NS	NS
			Pressure differential (kPa)	3/11/09	-0.12	4/30/09	0.05	8/5/09	-0.02	NS	NS
			TCA (µg/m^3)	3/11/09	-57,000	4/30/09	-4000	8/5/09	6300	NS	NS
			TCE (µg/m^3)	3/11/09	-1700	4/30/09	1580	8/5/09	1600	NS	NS
	102.5	100–105	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	11,600,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	43.7

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023 (cont.)	102.5	100–105	H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	9,840,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3920
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/2/09	0.09
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-60,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	5310
	150	150–152	CO_2 (µg/m^3)	3/11/09	12,500,000	4/30/09	3,230,000	8/5/09	7,450,000	NS	NS
			Freon-11 (µg/m^3)	3/11/09	-685	4/30/09	-642	8/5/09	-47	NS	NS
			H_2O (µg/m^3)	3/11/09	8,380,000	4/30/09	58.8[a]	8/5/09	15,600,000	NS	NS
			PCE (µg/m^3)	3/11/09	-4600	4/30/09	3140	8/5/09	-1600	NS	NS
			Pressure differential (kPa)	3/11/09	-0.3	4/30/09	0.03	8/5/09	-0.13	NS	NS
			TCA (µg/m^3)	3/11/09	-50,000	4/30/09	-4200	8/5/09	6200	NS	NS
			TCE (µg/m^3)	3/11/09	-1700	4/30/09	-767	8/5/09	-351	NS	NS
	152.5	150–155	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	9,000,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	69
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	9,900,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3870
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/2/09	0.17
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-42,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3570
	200	200–202	CO_2 (µg/m^3)	3/11/09	9,790,000	4/30/09	4,380,000	8/5/09	6,450,000	NS	NS
			Freon-11 (µg/m^3)	3/11/09	-568	4/30/09	-483	8/5/09	-457	NS	NS
			H_2O (µg/m^3)	3/11/09	8,570,000	4/30/09	61[a]	8/5/09	15,100,000	NS	NS
			PCE (µg/m^3)	3/11/09	-2200	4/30/09	-1800	8/5/09	686	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023	200	200–202	Pressure differential (kPa)	3/11/09	-0.35	4/30/09	0	8/5/09	-0.19	NS	NS
			TCA (µg/m^3)	3/11/09	-37,000	4/30/09	-2600	8/5/09	2980	NS	NS
			TCE (µg/m^3)	3/11/09	-1200	4/30/09	1890	8/5/09	1980	NS	NS
	202.5	200–205	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	7,150,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-169
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	8,050,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3920
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/2/09	0.37
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-42,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	5090
	247	247–249	CO_2 (µg/m^3)	3/11/09	8,350,000	4/30/09	4,340,000	8/5/09	5,030,000	NS	NS
			Freon-11 (µg/m^3)	3/11/09	-759	4/30/09	-1100	8/5/09	-498	NS	NS
			H_2O (µg/m^3)	3/11/09	8,940,000	4/30/09	58.2[a]	8/5/09	13,100,000	NS	NS
			PCE (µg/m^3)	3/11/09	-2700	4/30/09	-3200	8/5/09	-302	NS	NS
			Pressure differential (kPa)	3/11/09	-0.29	4/30/09	0.06	8/5/09	-0.23	NS	NS
			TCA (µg/m^3)	3/11/09	-30,000	4/30/09	-1300	8/5/09	7210	NS	NS
			TCE (µg/m^3)	3/11/09	202	4/30/09	1730	8/5/09	3450	NS	NS
	247.5	245–250	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	5,950,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-92
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	10,500,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3840
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/2/09	0.56

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-01023 (cont.)	247.5	245–250	TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-31,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	4090
	260.5	258–263	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	4,880,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-126
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	10,700,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3430
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/2/09	0.4
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	-23,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/2/09	3870
54-15461	Ambient	Ambient	CO_2 (µg/m^3)	3/9/09	970,000	4/29/09	774,000	8/6/09	811,000	12/1/09	985,000
			Freon-11 (µg/m^3)	3/9/09	199	4/29/09	-330	8/6/09	-40	12/1/09	-344
			H_2O (µg/m^3)	3/9/09	7,780,000	4/29/09	30.3[a]	8/6/09	9,070,000	12/1/09	7,090,000
			PCE (µg/m^3)	3/9/09	3290	4/29/09	-1100	8/6/09	1310	12/1/09	3030
			Pressure differential (kPa)	3/9/09	0	4/29/09	0	8/6/09	0	12/1/09	0
			TCA (µg/m^3)	3/9/09	-2200	4/29/09	-2700	8/6/09	-114	12/1/09	-4000
			TCE (µg/m^3)	3/9/09	2180	4/29/09	1110	8/6/09	2440	12/1/09	3380
	10	10–12	CO_2 (µg/m^3)	3/9/09	10,300,000	4/29/09	6,840,000	8/6/09	6,790,000	NS	NS
			Freon-11 (µg/m^3)	3/9/09	-524	4/29/09	-466	8/6/09	-136	NS	NS
			H_2O (µg/m^3)	3/9/09	10,900,000	4/29/09	61.3[a]	8/6/09	20,900,000	NS	NS
			PCE (µg/m^3)	3/9/09	-3000	4/29/09	-533	8/6/09	1060	NS	NS
			Pressure differential (kPa)	3/9/09	0	4/29/09	0	8/6/09	0	NS	NS
			TCA (µg/m^3)	3/9/09	-43,000	4/29/09	-11,000	8/6/09	1230	NS	NS
			TCE (µg/m^3)	3/9/09	-1300	4/29/09	-1600	8/6/09	952,000	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15461 (cont.)	11	10–12	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	9,000,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-43
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	15,500,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	3330
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.04
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-41,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	4420
	60	60–62	CO_2 (µg/m^3)	3/9/09	13,200,000	4/29/09	11,700,000	8/6/09	5,350,000	NS	NS
			Freon-11 (µg/m^3)	3/9/09	-835,000	4/29/09	-774	8/6/09	1100	NS	NS
			H_2O (µg/m^3)	3/9/09	11,600,000	4/29/09	61.8[a]	8/6/09	22,600,000	NS	NS
			PCE (µg/m^3)	3/9/09	-5400	4/29/09	-3100	8/6/09	488	NS	NS
			Pressure differential (kPa)	3/9/09	0.07	4/29/09	0.02	8/6/09	0.07	NS	NS
			TCA (µg/m^3)	3/9/09	-53,000	4/29/09	-14,000	8/6/09	-1700	NS	NS
			TCE (µg/m^3)	3/9/09	-1900	4/29/09	-618	8/6/09	-3100	NS	NS
	61	60–62	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	7,540,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-84.8
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	16,000,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	3850
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.12
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-32,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	3110
	95	95–97	CO_2 (µg/m^3)	3/9/09	13,800,000	4/29/09	11,500,000	8/6/09	7,640,000	NS	NS
			Freon-11 (µg/m^3)	3/9/09	-908	4/29/09	-1600	8/6/09	-370	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15461 (cont.)	95	95–97	H_2O (µg/m^3)	3/9/09	12,100,000	4/29/09	61.7[a]	8/6/09	19,700,000	NS	NS
			PCE (µg/m^3)	3/9/09	-5200	4/29/09	-5600	8/6/09	-2000	NS	NS
			Pressure differential (kPa)	3/9/09	0.07	4/29/09	0.02	8/6/09	0.08	NS	NS
			TCA (µg/m^3)	3/9/09	-54,000	4/29/09	-11,000	8/6/09	2270	NS	NS
			TCE (µg/m^3)	3/9/09	-2000	4/29/09	3450	8/6/09	13,800	NS	NS
	96	95–97	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	7,620,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-506
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	16,400,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	2370
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.12
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-30,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	4340
54-15462	Ambient	Ambient	CO_2 (µg/m^3)	4/2/09	796,000	4/29/09	871,000	8/6/09	771,000	12/1/09	885,000
			Freon-11 (µg/m^3)	4/2/09	-2600	4/29/09	-1500	8/6/09	553	12/1/09	96.6
			H_2O (µg/m^3)	4/2/09	24,300	4/29/09	35.3[a]	8/6/09	11,400,000	12/1/09	5,030,000
			PCE (µg/m^3)	4/2/09	5460	4/29/09	731	8/6/09	1370	12/1/09	4650
			Pressure differential (kPa)	4/2/09	0	4/29/09	0	8/6/09	0	12/1/09	0
			TCA (µg/m^3)	4/2/09	-4200	4/29/09	-6100	8/6/09	3380	12/1/09	-2500
			TCE (µg/m^3)	4/2/09	6080	4/29/09	1960	8/6/09	-507	12/1/09	4380
	10	10–12	CO_2 (µg/m^3)	4/2/09	2,510,000	4/29/09	8,560,000	8/6/09	3,460,000	NS	NS
			Freon-11 (µg/m^3)	4/2/09	-2200	4/29/09	153	8/6/09	38.7	NS	NS
			H_2O (µg/m^3)	4/2/09	54,400	4/29/09	59.8[a]	8/6/09	15,600,000	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	10	10–12	PCE (µg/m^3)	4/2/09	-3500	4/29/09	227	8/6/09	233	NS	NS
			Pressure differential (kPa)	4/2/09	0.15	4/29/09	0	8/6/09	0	NS	NS
			TCA (µg/m^3)	4/2/09	-4400	4/29/09	-13,000	8/6/09	-5100	NS	NS
			TCE (µg/m^3)	4/2/09	10,500	4/29/09	-1200	8/6/09	428	NS	NS
	12.5	10–15	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	13,400,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-303
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	10,900,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	2990
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.02
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-86,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	8070
	60	60–62	CO_2 (µg/m^3)	4/2/09	5,070,000	4/29/09	9,750,000	8/6/09	4,970,000	NS	NS
			Freon-11 (µg/m^3)	4/2/09	-1200	4/29/09	-2400	8/6/09	-72	NS	NS
			H_2O (µg/m^3)	4/2/09	58,400	4/29/09	60.6[a]	8/6/09	21,300,000	NS	NS
			PCE (µg/m^3)	4/2/09	7870	4/29/09	1990	8/6/09	3340	NS	NS
			Pressure differential (kPa)	4/2/09	0	4/29/09	0.06	8/6/09	0	NS	NS
			TCA (µg/m^3)	4/2/09	-19,000	4/29/09	-16,000	8/6/09	-5900	NS	NS
			TCE (µg/m^3)	4/2/09	1000	4/29/09	2030	8/6/09	-699	NS	NS
	62.5	60–65	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	12,600,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-530
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	11,800,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	5510

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	62.5	60–65	Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.18
			TCA ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	-73,000
			TCE ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	3740
	100	100–102	CO_2 ($\mu g/m^3$)	4/2/09	5,420,000	4/29/09	9,230,000	8/6/09	6,320,000	NS	NS
			Freon-11 ($\mu g/m^3$)	4/2/09	-2700	4/29/09	-1200	8/6/09	1250	NS	NS
			H_2O ($\mu g/m^3$)	4/2/09	53,100	4/29/09	60.7[a]	8/6/09	29,500,000	NS	NS
			PCE ($\mu g/m^3$)	4/2/09	-1700	4/29/09	-1800	8/6/09	581	NS	NS
			Pressure differential (kPa)	4/2/09	0	4/29/09	0.02	8/6/09	0	NS	NS
			TCA ($\mu g/m^3$)	4/2/09	-19,000	4/29/09	-13,000	8/6/09	-3700	NS	NS
			TCE ($\mu g/m^3$)	4/2/09	7080	4/29/09	1780	8/6/09	-2000	NS	NS
	102.5	100–105	CO_2 ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	10,400,000
			Freon-11 ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	-5
			H_2O ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	11,600,000
			PCE ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	4560
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.33
			TCA ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	-60,000
			TCE ($\mu g/m^3$)	NS	NS	NS	NS	NS	NS	12/1/09	3280
	150	150–152	CO_2 ($\mu g/m^3$)	4/2/09	3,450,000	4/29/09	5,990,000	8/6/09	4,560,000	NS	NS
			Freon-11 ($\mu g/m^3$)	4/2/09	-589	4/29/09	-1500	8/6/09	55	NS	NS
			H_2O ($\mu g/m^3$)	4/2/09	48,600	4/29/09	60.2[a]	8/6/09	22,900,000	NS	NS
			PCE ($\mu g/m^3$)	4/2/09	2440	4/29/09	-941	8/6/09	519	NS	NS
			Pressure differential (kPa)	4/2/09	-0.11	4/29/09	0.04	8/6/09	0	NS	NS
54-15462	150	150–152	TCA ($\mu g/m^3$)	4/2/09	-7200	4/29/09	-14,000	8/6/09	-3900	NS	NS
			TCE ($\mu g/m^3$)	4/2/09	2950	4/29/09	2640	8/6/09	799	NS	NS

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	152.5	150–155	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	9,400,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-1000
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	13,500,00
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	4690
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.59
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-48,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	6420
	200	200–202	CO_2 (µg/m^3)	4/2/09	4,230,000	4/29/09	5,960,000	8/6/09	3,990,000	NS	NS
			Freon-11 (µg/m^3)	4/2/09	-13,000	4/29/09	-1400	8/6/09	-1200	NS	NS
			H_2O (µg/m^3)	4/2/09	50,300	4/29/09	59.7[a]	8/6/09	21,200,000	NS	NS
			PCE (µg/m^3)	4/2/09	-4100	4/29/09	-2200	8/6/09	-391	NS	NS
			Pressure differential (kPa)	4/2/09	-0.11	4/29/09	0	8/6/09	-0.03	NS	NS
			TCA (µg/m^3)	4/2/09	-17,000	4/29/09	-7100	8/6/09	-5100	NS	NS
			TCE (µg/m^3)	4/2/09	55,900	4/29/09	4070	8/6/09	4210	NS	NS
	202.5	200–205	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	8,850,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	1630
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	13,600,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	7470
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.56
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-46,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-531

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	247.5	245–250	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	2,990,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-713
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	13,200,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	4550
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.73
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-19,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-68
	254	254–256	CO_2 (µg/m^3)	4/2/09	2,700,000	4/29/09	4,980,000	8/6/09	3,330,000	NS	NS
			Freon-11 (µg/m^3)	4/2/09	-11,000	4/29/09	-1600	8/6/09	-45.6	NS	NS
			H_2O (µg/m^3)	4/2/09	42,400	4/29/09	59.1[a]	8/6/09	20,600,000	NS	NS
			PCE (µg/m^3)	4/2/09	2060	4/29/09	-510	8/6/09	-291	NS	NS
			Pressure differential (kPa)	4/2/09	-0.03	4/29/09	0	8/6/09	-0.05	NS	NS
			TCA (µg/m^3)	4/2/09	-5400	4/29/09	7700	8/6/09	-133	NS	NS
			TCE (µg/m^3)	4/2/09	46,600	4/29/09	3930	8/6/09	512	NS	NS
	260.5	258-263	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	4,240,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	440
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	13,600,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	2230
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.58
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-24,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	2120
	282.5	280–285	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	7,110,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-473

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-15462 (cont.)	282.5	280–285	H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	13,600,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	1540
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.5
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-32,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	5680
	297.5	295–300	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	6,080,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-256
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	15,300,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	3310
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/1/09	0.69
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	-26,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/1/09	6770
54-609985	Ambient	Ambient	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	1,460,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	218
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3,060,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	1660
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	NS	NS
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	1410
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	2280
	6.5	4–9	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	6,170,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-10
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,130,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	2640

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985 (cont.)	6.5	4–9	Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	0
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-14,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3420
	62.5	60–65	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	16,900,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-178
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	46,100,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3970
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	0
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-50,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4940
	102.5	100–105	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	13,500,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-598
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,520,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	2890
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	-0.02
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-45,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	6530
	152.5	150–155	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	10,700,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-468
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,580,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3290
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	-0.15

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985 (cont.)	152.5	150–155	TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-39,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	5090
	202.5	200–205	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	9,300,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-82
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,550,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3170
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	-0.19
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-31,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3920
	247.5	245–250	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	7,460,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-263
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,230,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4940
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	-0.16
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-27,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4530
	260.5	258–263	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	6,370,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	220
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,620,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3580
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	-0.14
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-20,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3800

Table 4.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling-Port Depth or Interval (ft bgs)	Analyte (Unit)	2nd Quarter FY2009		3rd Quarter FY2009		4th Quarter FY2009		1st Quarter FY2010	
				Date	Result	Date	Result	Date	Result	Date	Result
54-609985 (cont.)	282.5	280–285	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	6,240,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-177
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,860,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3540
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	-0.14
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-23,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3740
	297.5	295–300	CO_2 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	5,800,000
			Freon-11 (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-96
			H_2O (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	4,950,000
			PCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	2170
			Pressure differential (kPa)	NS	NS	NS	NS	NS	NS	12/4/09	-0.13
			TCA (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	-20,000
			TCE (µg/m^3)	NS	NS	NS	NS	NS	NS	12/4/09	3380

Note: All results reported in µg/m^3 were converted from mg/m^3. B&K detection threshold is gas dependent, reliable values are typically above 1 ppm (1000 to 7000 µg/m^3 depending on the analyte).

[a] NS = Not sampled.

[b] Results presented in TDew (dew point).

Table 5.0-1
Pore-Gas VOCs Detected at MDA H, First Quarter FY2010 and Three Previous Quarters

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result ($\mu g/m^3$)	Date	Result (ppbv)	Result ($\mu g/m^3$)	Date	Result (ppbv)	Result ($\mu g/m^3$)	Date	Result (ppbv)	Result ($\mu g/m^3$)
54-01023	10	10–12	Acetone	3/11/09	5	12	4/30/09	ND[a]	ND	8/5/09	ND	ND	NS[b]	NS	NS
			Butanone[2-]	3/11/09	ND	ND	4/30/09	4.1	12	8/5/09	ND	ND	NS	NS	NS
			Dichlorodifluoromethane	3/11/09	3.1	15	4/30/09	1.7	8.3	8/5/09	3.8	19	NS	NS	NS
			Tetrachloroethene	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	1.1	7.2	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	1.4	11	NS	NS	NS
			Trichloroethane[1,1,1-]	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	3.7	20	NS	NS	NS
			Trichloroethene	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	1.2	6.3	NS	NS	NS
			Trichlorofluoromethane	3/11/09	7.1	40	4/30/09	2.9	16	8/5/09	10	58	NS	NS	NS
	12.5	10–15	Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	41	200
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	2.4	12
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	0.9	4.9
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	5.2	29
	60	60–62	Acetone	3/11/09	5.5	13	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Butanol[1-]	3/11/09	11 (J)	32 (J)	4/30/09	4.9 (J)	15 (J)	8/5/09	ND	ND	NS	NS	NS
			Butanone[2-]	3/11/09	ND	ND	4/30/09	3.4	10	8/5/09	ND	ND	NS	NS	NS
			Chlorobenzene	3/11/09	ND	ND	4/30/09	1.1	5	8/5/09	1.2	5.8	NS	NS	NS
			Dichlorodifluoromethane	3/11/09	5	25	4/30/09	2.1	10	8/5/09	4.8	24	NS	NS	NS
			Tetrachloroethene	3/11/09	1	6.9	4/30/09	ND	ND	8/5/09	1.3	9	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/11/09	1.2	9.3	4/30/09	ND	ND	8/5/09	1.7	13	NS	NS	NS
			Trichloroethane[1,1,1-]	3/11/09	2.7	15	4/30/09	ND	ND	8/5/09	4.5	25	NS	NS	NS
			Trichloroethene	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	1.9	10	NS	NS	NS
			Trichlorofluoromethane	3/11/09	11	61	4/30/09	3.9	22	8/5/09	13	75	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023 (cont.)	62.5	60–65	Carbon Disulfide	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	2	6.4
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	5.2	26
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.3 (J-)	9.8 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3	16
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.1	6.1
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	12	65
	100	100–102	Acetone	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	16	37	NS	NS	NS
			Butanol[1-]	3/11/09	6.4	20	4/30/09	9.2 (J)	28 (J)	8/5/09	5.2 (J)	16 (J)	NS	NS	NS
			Butanone[2-]	3/11/09	ND	ND	4/30/09	2.8	8.3	8/5/09	2.7	7.8	NS	NS	NS
			Chlorobenzene	3/11/09	0.93	4.3	4/30/09	2	9.2	8/5/09	2	9.1	NS	NS	NS
			Dichlorodifluoromethane	3/11/09	5.4	27	4/30/09	1.2	6.2	8/5/09	3.9	19	NS	NS	NS
			Dichloroethene[1,1-]	3/11/09	1.3	5	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Tetrachloroethene	3/11/09	0.9	6.1	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Tetrahydrofuran	3/11/09	ND	ND	4/30/09	5.9	17	8/5/09	ND	ND	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/11/09	1.7	13	4/30/09	ND	ND	8/5/09	1.4	10	NS	NS	NS
			Trichloroethane[1,1,1-]	3/11/09	2.5	14	4/30/09	ND	ND	8/5/09	3.5	19	NS	NS	NS
			Trichloroethene	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	1.2	6.3	NS	NS	NS
			Trichlorofluoromethane	3/11/09	11	64	4/30/09	1.8	10	8/5/09	10	56	NS	NS	NS
	102.5	100–105	Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	4.3	21
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.2 (J-)	9.5 (J-)

Table 5.0-1 (continued)

				2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023 (cont.)	102.5	100–105	Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.7	20
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	0.88	4.7
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	7.6	42
	150	150–152	Acetone	3/11/09	4.6	11	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Butanol[1-]	3/11/09	15	45	4/30/09	19 (J)	57 (J)	8/5/09	9.3 (J)	28 (J)	NS	NS	NS
			Butanone[2-]	3/11/09	1.1	3.2	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Chlorobenzene	3/11/09	1.3	5.9	4/30/09	2.5	11	8/5/09	1.5	7.1	NS	NS	NS
			Dichlorodifluoromethane	3/11/09	4.8	24	4/30/09	1.3	6.4	8/5/09	3.7	18	NS	NS	NS
			Dichloroethene[1,1-]	3/11/09	1.4	5.4	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Toluene	3/11/09	1.5	5.6	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/11/09	1.6	12	4/30/09	ND	ND	8/5/09	1.3	9.7	NS	NS	NS
			Trichloroethane[1,1,1-]	3/11/09	2.5	14	4/30/09	ND	ND	8/5/09	4	22	NS	NS	NS
			Trichloroethene	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	1	5.6	NS	NS	NS
			Trichlorofluoromethane	3/11/09	9.2	52	4/30/09	1.6	9	8/5/09	7	39	NS	NS	NS
	152.5	150–155	Carbon Disulfide	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.4	4.2
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.2	16
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.1 (J-)	8.4 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.2	18
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.8	21
	200	200–202	Acetone	3/11/09	5	12	4/30/09	ND	ND	8/5/09	5	12	NS	NS	NS
			Butanone[2-]	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	0.95	2.8	NS	NS	NS
			Carbon Disulfide	3/11/09	ND	ND	4/30/09	2.8	8.6	8/5/09	2.2	7	NS	NS	NS
			Carbon Tetrachloride	3/11/09	1.1	7	4/30/09	ND	ND	8/5/09	1	6.6	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023 (cont.)	200	200–202	Dichlorodifluoromethane	3/11/09	5.8	29	4/30/09	1.8	8.8	8/5/09	4.2	21	NS	NS	NS
			Dichloroethene[1,1-]	3/11/09	2.1	8.4	4/30/09	ND	ND	8/5/09	ND	ND	NS	NS	NS
			Dichloropropane[1,2-]	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	0.93 (J)	4.3 (J)	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/11/09	2.4	19	4/30/09	ND	ND	8/5/09	2	15	NS	NS	NS
			Trichloroethane[1,1,1-]	3/11/09	3.7	20	4/30/09	ND	ND	8/5/09	5.2	28	NS	NS	NS
			Trichloroethene	3/11/09	ND	ND	4/30/09	ND	ND	8/5/09	0.97	5.2	NS	NS	NS
			Trichlorofluoromethane	3/11/09	6.7	38	4/30/09	1.9	11	8/5/09	5.5	31	NS	NS	NS
	202.5	200–205	Acetone	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	4.3	10
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.6	11
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	5.5	19
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.8	19
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.2	5.6
			Toluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.9	7.2
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.2	17
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.9	22
	247	247–249	Butanol[1-]	3/11/09	32	98	4/30/09	37 (J)	110 (J)	8/5/09	19 (J)	59 (J)	NS	NS	NS
			Carbon Tetrachloride	3/11/09	1.1	7	4/30/09	ND	ND	8/5/09	1.3	8.2	NS	NS	NS
			Chlorobenzene	3/11/09	4.8	22	4/30/09	7	32	8/5/09	8.4	39	NS	NS	NS
			Dichlorodifluoromethane	3/11/09	4.3	21	4/30/09	1.6	7.8	8/5/09	3.5	17	NS	NS	NS
			Methylene Chloride	3/11/09	ND	ND	4/30/09	1.8	6.1	8/5/09	ND	ND	NS	NS	NS
			Toluene	3/11/09	0.98	3.7	4/30/09	ND	ND	8/5/09	3	11	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	3/11/09	1.6	12	4/30/09	ND	ND	8/5/09	1.5	12	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-01023 (cont.)	247	247–249	Trichloroethane[1,1,1-]	3/11/09	1.3	7	4/30/09	ND	ND	8/5/09	2.3	12	NS	NS	NS
			Trichlorofluoromethane	3/11/09	4.6	26	4/30/09	1.7	9.8	8/5/09	4.1	23	NS	NS	NS
	247.5	245–250	Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	6.6	23
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	2.4	12
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	0.92	4.2
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.3	6.9
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	2.4	13
	260.5	258–263	Acetone	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	5.8	14
			Butanone[2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	0.9	2.6
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	4	14
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	2.1	10
			Propylene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	3.5	6
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/2/09	1.8	10
54-15461	10	10–12	Carbon Disulfide	3/9/09	2.2	6.7	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Dichlorodifluoromethane	3/9/09	2.6	13	4/29/09	1.2	5.8	8/6/09	1.5	7.3	NS	NS	NS
			Toluene	3/9/09	ND	ND	4/29/09	2.1	8	8/6/09	ND	ND	NS	NS	NS
			Trichloroethane[1,1,1-]	3/9/09	1.3	7.3	4/29/09	ND	ND	8/6/09	1.1	5.9	NS	NS	NS
			Trichlorofluoromethane	3/9/09	1.6	9	4/29/09	ND	ND	8/6/09	1.1	6	NS	NS	NS
	11	10–12	Carbon Disulfide	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.9	2.8
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.4	12
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.7	9.3
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.4	7.8
	60	60–62	Carbon Disulfide	3/9/09	1.4	4.3	4/29/09	2	6.2	8/6/09	ND	ND	NS	NS	NS
			Dichlorodifluoromethane	3/9/09	3.2	16	4/29/09	3.3	16	8/6/09	1.8	9.1	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result ($\mu g/m^3$)	Date	Result (ppbv)	Result ($\mu g/m^3$)	Date	Result (ppbv)	Result ($\mu g/m^3$)	Date	Result (ppbv)	Result ($\mu g/m^3$)
54-15461 (cont.)	60	60–62	Trichloroethane[1,1,1-]	3/9/09	1.8	9.7	4/29/09	1.4	7.7	8/6/09	1.1	6.1	NS	NS	NS
			Trichlorofluoromethane	3/9/09	2.3	13	4/29/09	2.6	14	8/6/09	1.2	7	NS	NS	NS
	61	60–62	Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.2	11
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.3	7.1
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.5	8.7
	95	95–97	Acetone	3/9/09	11	27	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Butanone[2-]	3/9/09	1.8	5.3	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Carbon Disulfide	3/9/09	ND	ND	4/29/09	ND	ND	8/6/09	2.9	9	NS	NS	NS
			Dichlorodifluoromethane	3/9/09	3.5	17	4/29/09	3.4	16	8/6/09	1.9	9.3	NS	NS	NS
			Trichloroethane[1,1,1-]	3/9/09	2	11	4/29/09	1.4	7.4	8/6/09	1.1	5.9	NS	NS	NS
			Trichlorofluoromethane	3/9/09	2.9	16	4/29/09	2.7	15	8/6/09	1.6	8.8	NS	NS	NS
	96	95–97	Acetone	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	3.6	8.5
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.7	8.3
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.7	13
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.5	8.2
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2	12
54-15462	10	10–12	Acetone	4/2/09	10	25	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Benzene	4/2/09	4.9	16	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Butanone[2-]	4/2/09	2.8	8.4	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Cyclohexane	4/2/09	2.7	9.4	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Dichlorodifluoromethane	4/2/09	1.7	8.6	4/29/09	3.4	17	8/6/09	1	4.9	NS	NS	NS
			Dichloroethene[1,1-]	4/2/09	ND	ND	4/29/09	1.6	6.6	8/6/09	ND	ND	NS	NS	NS
			Ethylbenzene	4/2/09	1.3	5.8	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Hexane	4/2/09	2.5	8.8	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	10	10–12	n-Heptane	4/2/09	1.4	6	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Propanol[2-]	4/2/09	96	240	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Propylene	4/2/09	10	18	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Tetrahydrofuran	4/2/09	1.6	4.6	4/29/09	ND	ND	8/6/09	1.1	3.4	NS	NS	NS
			Toluene	4/2/09	280	1000	4/29/09	5.4	20	8/6/09	ND	ND	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/2/09	ND	ND	4/29/09	1.4	11	8/6/09	ND	ND	NS	NS	NS
			Trichloroethane[1,1,1-]	4/2/09	1.7	9.5	4/29/09	4.6	25	8/6/09	2.3	12	NS	NS	NS
			Trichlorofluoromethane	4/2/09	1.1	6.1	4/29/09	3	17	8/6/09	ND	ND	NS	NS	NS
			Xylene[1,2-]	4/2/09	1.8	7.6	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Xylene[1,3-]+Xylene[1,4-]	4/2/09	3.5	15	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
	12.5	10–15	Butanone[2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.5	4.4
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	90	440
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	4.6	22
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2 (J-)	15 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	9.9	54
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	4.1	23
	60	60–62	Acetone	4/2/09	35	84	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Butanol[1-]	4/2/09	12	37	4/29/09	7 (J)	21 (J)	8/6/09	4.9 (J)	15 (J)	NS	NS	NS
			Butanone[2-]	4/2/09	4.8	14	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Carbon Disulfide	4/2/09	6.5	20	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Chlorobenzene	4/2/09	1.3	5.9	4/29/09	1.8	8.4	8/6/09	2.2	10	NS	NS	NS
			Dichlorodifluoromethane	4/2/09	4.1	20	4/29/09	6.6	32	8/6/09	2.8	14	NS	NS	NS
			Dichloroethene[1,1-]	4/2/09	ND	ND	4/29/09	3.9	15	8/6/09	ND	ND	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	60	60–62	Methanol	4/2/09	ND	ND	4/29/09	ND	ND	8/6/09	190 (J)	250 (J)	NS	NS	NS
			Propanol[2-]	4/2/09	92	230	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Tetrahydrofuran	4/2/09	2.5	7.3	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Toluene	4/2/09	45	170	4/29/09	1.4	5.3	8/6/09	1	3.9	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/2/09	1.5	11	4/29/09	2.8	22	8/6/09	1.1	8.7	NS	NS	NS
			Trichloroethane[1,1,1-]	4/2/09	5.3	29	4/29/09	10	56	8/6/09	5.5	30	NS	NS	NS
			Trichlorofluoromethane	4/2/09	2.8	16	4/29/09	5.7	32	8/6/09	2.4	13	NS	NS	NS
			Xylene[1,3-]+Xylene[1,4-]	4/2/09	0.89	3.9	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
	62.5	60–65	Bromodichloromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.88	5.9
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	170	820
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	7.4	36
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.1	7.6
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.9 (J-)	22 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	17	91
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.1	5.7
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	7.1	40
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.4	6.2
	100	100–102	Acetone	4/2/09	30	70	4/29/09	10	24	8/6/09	ND	ND	NS	NS	NS
			Benzene	4/2/09	0.85 (J)	2.7 (J)	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Butanol[1-]	4/2/09	18	53	4/29/09	14 (J)	41 (J)	8/6/09	47 (J)	140 (J)	NS	NS	NS
			Butanone[2-]	4/2/09	4.2	12	4/29/09	1.7	5.1	8/6/09	ND	ND	NS	NS	NS
			Chlorobenzene	4/2/09	2.3	10	4/29/09	2.8	13	8/6/09	4.4	20	NS	NS	NS
			Dichlorodifluoromethane	4/2/09	3.9	19	4/29/09	7	35	8/6/09	3.6	18	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	100	100–102	Dichloroethene[1,1-]	4/2/09	ND	ND	4/29/09	4.1	16	8/6/09	ND	ND	NS	NS	NS
			Propanol[2-]	4/2/09	ND	ND	4/29/09	20	50	8/6/09	26	63	NS	NS	NS
			Tetrahydrofuran	4/2/09	2.9	8.4	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Toluene	4/2/09	22	84	4/29/09	1.7	6.5	8/6/09	2.2	8.4	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/2/09	1.4	11	4/29/09	3.1	24	8/6/09	1.6	12	NS	NS	NS
			Trichloroethane[1,1,1-]	4/2/09	6	33	4/29/09	14	74	8/6/09	7.8	43	NS	NS	NS
			Trichloroethene	4/2/09	ND	ND	4/29/09	1	5.4	8/6/09	ND	ND	NS	NS	NS
			Trichlorofluoromethane	4/2/09	2.8	16	4/29/09	6.4	36	8/6/09	3.4	19	NS	NS	NS
	102.5	100–105	Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	100	490
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.85 (J)	2.9 (J)
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	6.6	32
			Dichloroethane[1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.87	3.5
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.85 (J)	5.8 (J)
			Toluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1	3.8
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.5 (J-)	19 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	14	80
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.2	6.5
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	6.2	35
	150	150–152	Acetone	4/2/09	49	120	4/29/09	11	27	8/6/09	ND	ND	NS	NS	NS
			Benzene	4/2/09	1.2	3.7	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Butanol[1-]	4/2/09	29	89	4/29/09	29 (J)	88 (J)	8/6/09	67 (J)	200 (J)	NS	NS	NS
			Butanone[2-]	4/2/09	0.89	2.6	4/29/09	2	5.9	8/6/09	ND	ND	NS	NS	NS
			Carbon Disulfide	4/2/09	ND	ND	4/29/09	ND	ND	8/6/09	8.8	28	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	150	150–152	Chlorobenzene	4/2/09	5.2	24	4/29/09	6.6	30	8/6/09	6.8	31	NS	NS	NS
			Dichlorodifluoromethane	4/2/09	3.1	15	4/29/09	7.4	37	8/6/09	2.8	14	NS	NS	NS
			Dichloroethene[1,1-]	4/2/09	ND	ND	4/29/09	3.5	14	8/6/09	ND	ND	NS	NS	NS
			Propanol[2-]	4/2/09	ND	ND	4/29/09	ND	ND	8/6/09	4	10	NS	NS	NS
			Toluene	4/2/09	31	120	4/29/09	3.1	12	8/6/09	2.6	9.7	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/2/09	1.1	8.4	4/29/09	3.3	25	8/6/09	1.1	8.7	NS	NS	NS
			Trichloroethane[1,1,1-]	4/2/09	3.3	18	4/29/09	9.8	54	8/6/09	5.3	29	NS	NS	NS
			Trichloroethene	4/2/09	ND	ND	4/29/09	0.89 (J)	4.8 (J)	8/6/09	ND	ND	NS	NS	NS
			Trichlorofluoromethane	4/2/09	1.9	11	4/29/09	5.8	32	8/6/09	2.4	13	NS	NS	NS
	152.5	150–155	Bromodichloromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1	6.9
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	290	1400
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.3	4.5
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	6.3	31
			Ethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.97	4.2
			Propylene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	4.8	8.3
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.98	6.6
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.3 (J-)	18 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	10	57
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.9	4.8
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	5	28
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.3	5.8

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m3)	Date	Result (ppbv)	Result (µg/m3)	Date	Result (ppbv)	Result (µg/m3)	Date	Result (ppbv)	Result (µg/m3)
54-15462 (cont.)	200	200–202	Acetone	4/2/09	33	78	4/29/09	9	21	8/6/09	ND	ND	NS	NS	NS
			Benzene	4/2/09	ND	ND	4/29/09	1.3	4.3	8/6/09	1.3	4.2	NS	NS	NS
			Butanol[1-]	4/2/09	42	130	4/29/09	53 (J)	160 (J)	8/6/09	120 (J)	370 (J)	NS	NS	NS
			Butanone[2-]	4/2/09	5.7	17	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Carbon Disulfide	4/2/09	ND	ND	4/29/09	ND	ND	8/6/09	2.7	8.4	NS	NS	NS
			Chlorobenzene	4/2/09	6.2	29	4/29/09	13	60	8/6/09	14	66	NS	NS	NS
			Dichlorodifluoromethane	4/2/09	4.5	22	4/29/09	7.1	35	8/6/09	2.4	12	NS	NS	NS
			Dichloroethene[1,1-]	4/2/09	ND	ND	4/29/09	2.8	11	8/6/09	ND	ND	NS	NS	NS
			Ethanol	4/2/09	32	60	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Propanol[2-]	4/2/09	ND	ND	4/29/09	110	280	8/6/09	78	190	NS	NS	NS
			Tetrahydrofuran	4/2/09	2.9	8.4	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Toluene	4/2/09	53	200	4/29/09	5.6	21	8/6/09	6.2	23	NS	NS	NS
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/2/09	ND	ND	4/29/09	3.1	24	8/6/09	0.95	7.2	NS	NS	NS
			Trichloroethane[1,1,1-]	4/2/09	5	27	4/29/09	9.7	53	8/6/09	3.7	20	NS	NS	NS
			Trichloroethene	4/2/09	ND	ND	4/29/09	0.96	5.1	8/6/09	ND	ND	NS	NS	NS
			Trichlorofluoromethane	4/2/09	2.8	15	4/29/09	5.3	30	8/6/09	1.9	11	NS	NS	NS
	202.5	200–205	Benzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.4	4.5
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	160	760
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.3	7.9
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	6	30

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462	202.5	200–205	Ethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.86	3.7
			Propylene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	5	8.6
			Toluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	0.97	3.7
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.1 (J-)	16 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	7.8	42
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	4.3	24
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.5	6.5
	247.5	245–250	Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	77	380
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.8	9.1
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1	5.6
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1	5.9
	254	254–256	Acetone	4/2/09	300	720	4/29/09	ND	ND	8/6/09	ND	ND	NS	NS	NS
			Benzene	4/2/09	ND	ND	4/29/09	1.9	6.2	8/6/09	3.5	11	NS	NS	NS
			Butanol[1-]	4/2/09	50	150	4/29/09	67 (J)	200 (J)	8/6/09	200 (J)	600 (J)	NS	NS	NS
			Butanone[2-]	4/2/09	8.4	25	4/29/09	3.9	11	8/6/09	ND	ND	NS	NS	NS
			Carbon Disulfide	4/2/09	ND	ND	4/29/09	ND	ND	8/6/09	1	3.1	NS	NS	NS
			Chlorobenzene	4/2/09	11	49	4/29/09	17	79	8/6/09	25	110	NS	NS	NS
			Dichlorobenzene[1,4-]	4/2/09	ND	ND	4/29/09	0.95	5.7	8/6/09	1.1	6.9	NS	NS	NS
			Dichlorodifluoromethane	4/2/09	ND	ND	4/29/09	6.6	33	8/6/09	1.8	9	NS	NS	NS
			Ethanol	4/2/09	ND	ND	4/29/09	ND	ND	8/6/09	3.8 (J)	7.1 (J)	NS	NS	NS
			Propanol[2-]	4/2/09	ND	ND	4/29/09	ND	ND	8/6/09	170	410	NS	NS	NS
			Propylene	4/2/09	ND	ND	4/29/09	6.1	10	8/6/09	ND	ND	NS	NS	NS
			Toluene	4/2/09	200	750	4/29/09	210	800	8/6/09	28	110	NS	NS	NS

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-15462 (cont.)	254	254–256	Trichloro-1,2,2-trifluoroethane[1,1,2-]	4/2/09	ND	ND	4/29/09	2.7	21	8/6/09	ND	ND	NS	NS	NS
			Trichloroethane[1,1,1-]	4/2/09	ND	ND	4/29/09	6.9	38	8/6/09	2.8	15	NS	NS	NS
			Trichlorofluoromethane	4/2/09	ND	ND	4/29/09	4.4	25	8/6/09	1.5	8.2	NS	NS	NS
			Xylene[1,2-]	4/2/09	ND	ND	4/29/09	2.3	10	8/6/09	1.9	8.4	NS	NS	NS
			Xylene[1,3-]+Xylene[1,4-]	4/2/09	ND	ND	4/29/09	1.3	5.7	8/6/09	ND	ND	NS	NS	NS
	260.5	258–263	Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	74	360
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.7	5.8
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2.4	12
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.6	8.5
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.5	8.4
	282.5	280–285	Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	77	370
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	8.4	29
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	6.2	30
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	2 (J-)	15 (J-)
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	4.3	23
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	3.9	22
	297.5	295–300	Butanone[2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	3.4	10
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	4.4	14
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	92	450
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	8.8	30
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	5.3	26
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	1.8 (J-)	13 (J-)

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-15462 (cont.)	297.5	295–300	Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	3	16
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/1/09	3.3	19
54-609985	6.5	4–9	Acetone	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	4.6	11
			Benzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.3	7.3
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.94	3.2
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.2	6.1
			Hexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.6	5.6
			n-Heptane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5
			Toluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.1	8
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.7	9.1
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.86	4.8
	62.5	60–65	Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	34	160
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	8.3	41
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.7	13
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	8.1	44
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.86	4.6
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	8	45
	102.5	100–105	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.94	5.9
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	21	100
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	8	39
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.7	13
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	8	44

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-609985 (cont.)	102.5	100–105	Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.95	5.1
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	6.7	38
	152.5	150–155	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.97	6.1
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.98	4.8
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.5	8.6
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	7.9	39
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.9	15
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	8.6	47
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.1	6
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	6.4	36
	202.5	200–205	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	3	19
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	5	18
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	55	270
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	10	34
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	9.2	45
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5.7
			Tetrachloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.84	5.7
			Toluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.8	6.6
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.5	19
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	7.3	40
			Trichloroethene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.88	4.7
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	6.6	37

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)	Date	Result (ppbv)	Result (µg/m³)
54-609985 (cont.)	202.5	200–205	Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.4	5.9
	247.5	245–250	Benzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	4.4	14
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	3	19
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	5.7	20
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	27	130
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	19	64
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	8	39
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5.5
			Ethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.8 (J)	3.5 (J)
			Ethyltoluene[4-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.92	4.5
			Hexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	4.6	16
			n-Heptane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	4.2	17
			Toluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.5	5.8
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.9	15
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	3.7	20
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	5.1	29
			Xylene[1,3-]+Xylene[1,4-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.2	5.3
	260.5	258–263	Acetone	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	3.7	8.8
			Butanone[2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.91	2.7
			Carbon Disulfide	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.86	2.7
			Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.7	17
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	5.2	18
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	24	120

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-609985 (cont.)	260.5	258–263	Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	17	59
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	6.8	34
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1	4.7
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.6	12
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.9	16
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	4.4	25
	282.5	280–285	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	3.1	19
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	5.2	18
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	24	120
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	22	78
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	6.3	31
			Dichloropropane[1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	0.96	4.4
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.6	12
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.3	13
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	4	22

Table 5.0-1 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	Analyte	2nd Quarter FY09			3rd Quarter FY09			4th Quarter FY09			1st Quarter FY10		
				Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)	Date	Result (ppbv)	Result (µg/m^3)
54-609985 (cont.)	297.5	295–300	Carbon Tetrachloride	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	2.8	18
			Chlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	4.8	17
			Chloroform	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	11	54
			Cyclohexane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	24	81
			Dichlorodifluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	5.7	28
			Trichloro-1,2,2-trifluoroethane[1,1,2-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.4	10
			Trichloroethane[1,1,1-]	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	1.7	9.3
			Trichlorofluoromethane	NS	NS	NS	NS	NS	NS	NS	NS	NS	12/4/09	3.5	20

Note: See Appendix A for data qualifier definitions.

[a] ND = Not detected.

[b] NS = Not sampled.

Table 5.0-2
Tritium Pore-Vapor Results at MDA H, First Quarter FY2010 and Three Previous Quarters

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	2nd Quarter FY09		3rd Quarter FY09		4th Quarter FY09		1st Quarter FY10	
			Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)
54-01023	10	10–12	3/10/09	4,635,190	5/4/09	16,424,700	8/6/09	6,836,460	NS[a]	NS
	12.5	10–15	NS	NS	NS	NS	NS	NS	12/15/09	271,780 (J)
	60	60–62	3/10/09	3,998,480	5/4/09	9,284,720	8/6/09	2,963,040	NS	NS
	62.5	60–65	NS	NS	NS	NS	NS	NS	12/15/09	398,879 (J)
	100	100–102	3/10/09	2,337,200	5/4/09	5,507,850	8/6/09	2,057,790	NS	NS
	102.5	100–105	NS	NS	NS	NS	NS	NS	12/15/09	284, 857 (J)
	150	150–152	3/10/09	1,155,930	5/4/09	2,382,130	8/6/09	1,320,480	NS	NS
	152.5	150–155	NS	NS	NS	NS	NS	NS	12/15/09	132,499 (J)
	200	200–202	3/10/09	1,244,830	5/4/09	2,149,850	8/6/09	699,163	NS	NS
	202.5	200–205	NS	NS	NS	NS	NS	NS	12/15/09	7090.85 (J)
	247	247–249	3/10/09	746,273	5/11/09	ND[b]	8/6/09	860,847	NS	NS
	247.5	245–250	NS	NS	NS	NS	NS	NS	12/16/09	86,977 (J)
	260.5	258–263	NS	NS	NS	NS	NS	NS	12/16/09	104,258 (J)
54-15461	10	10–12	3/11/09	2369.83	4/30/09	4937.48	8/7/09	3112.83	NS	NS
	11	10–12	NS	NS	NS	NS	NS	NS	12/14/09	2928.45
	60	60–62	3/11/09	8706.76	4/30/09	937.567	8/10/09	1183.58	NS	NS
	61	60–62	NS	NS	NS	NS	NS	NS	12/14/09	ND
	95	95–97	3/11/09	21,854.8	4/30/09	621.228	8/7/09	1558.41	NS	NS
	96	95–97	NS	NS	NS	NS	NS	NS	12/14/09	ND
54-15462	10	10–12	4/6/09	ND[b]	5/1/09	1161.33	8/7/09	864.929	NS	NS
	12.5	10–15	NS	NS	NS	NS	NS	NS	12/10/09	2304.88
	60	60–62	4/6/09	ND	5/1/09	1130.24	8/7/09	1068.52	NS	NS
	62.5	60–65	NS	NS	NS	NS	NS	NS	12/11/09	ND
	100	100–102	4/6/09	ND	5/1/09	904.313	8/10/09	668.452	NS	NS

Table 5.0-2 (continued)

Borehole ID	Port Depth (ft bgs)	Sampling Port Depth or Interval (ft bgs)	2nd Quarter FY09		3rd Quarter FY09		4th Quarter FY09		1st Quarter FY10	
			Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)	Date	Result (pCi/L)
54-15462 (cont.)	102.5	100–105	NS	NS	NS	NS	NS	NS	12/14/09	ND
	150	150–152	4/3/09	ND	5/4/09	701.119	8/7/09	475.882	NS	NS
	152.5	150–155	NS	NS	NS	NS	NS	NS	12/15/09	3037.27
	200	200–202	4/3/09	369.9	5/4/09	797.65	8/7/09	566.728	NS	NS
	202.5	200–205	NS	NS	NS	NS	NS	NS	12/15/09	043.86 (J)
	247.5	245–250	NS	NS	NS	NS	NS	NS	12/14/09	ND
	254	254–256	4/3/09	ND	5/1/09	1026.2	8/10/09	1492.27	NS	NS
	260.5	258–263	NS	NS	NS	NS	NS	NS	12/15/09	-46.98 (R)
	282.5	280–285	NS	NS	NS	NS	NS	NS	12/14/09	ND
	297.5	295–300	NS	NS	NS	NS	NS	NS	12/14/09	ND
54-609985	6.5	4–9	NS	NS	NS	NS	NS	NS	12/15/09	ND
	62.5	60–65	NS	NS	NS	NS	NS	NS	12/16/09	ND
	102.5	100–105	NS	NS	NS	NS	NS	NS	12/16/09	ND
	152.5	150–155	NS	NS	NS	NS	NS	NS	12/16/09	ND
	202.5	200–205	NS	NS	NS	NS	NS	NS	12/16/09	ND
	247.5	245–250	NS	NS	NS	NS	NS	NS	12/16/09	ND
	260.5	258–263	NS	NS	NS	NS	NS	NS	12/16/09	ND
	282.5	280–285	NS	NS	NS	NS	NS	NS	12/16/09	ND
	297.5	295–300	NS	NS	NS	NS	NS	NS	12/16/09	ND

Note: See Appendix A for data qualifier definitions.

[a] NS = Not sampled.

[b] ND = Not detected.

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

B&K	Brüel and Kjær
bgs	below ground surface
CAS	Chemical Abstract Service
DCE	1,1-dichloroethylene
DER	duplicate error ratio
EPA	Environmental Protection Agency (U.S.)
FLUTe	Flexible Liner Underground Technology
FY	fiscal year
LANL	Los Alamos National Laboratory
LCS	laboratory control sample
MCL	maximum contaminant level
MDA	material disposal area
MDC	minimum detectable concentration
ND	not detected
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NS	not sampled
PCE	tetrachloroethene
PID	photoionization detector
QA	quality assurance
QC	quality control
RPD	relative percent difference
RPF	Records Processing Facility
SL	screening level
SV	screening value
SOP	standard operating procedure
SOW	statement of work
TA	technical area
TCA	1,1,1-trichloroethane
TCE	trichloroethene
TPU	total propagated uncertainty
VOC	volatile organic compound

A-2.0 METRIC CONVERSION TABLE

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

A-3.0 DATA QUALIFIER DEFINITIONS

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

Appendix B

Quality Assurance/Quality Control Program

B-1.0 INTRODUCTION

This appendix discusses analytical methods and data quality review and summarizes the effects of data quality exceptions on the acceptability of the analytical laboratory data.

Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the Los Alamos National Laboratory (LANL or the Laboratory) "Quality Assurance Project Plan Requirements for Sampling and Analysis" (LANL 1996, 054609) and the Laboratory's statement of work (SOW) for analytical services (LANL 2000, 071233). The results of the QA/QC activities were used to estimate the accuracy, bias, and precision of the analytical measurements. QC samples, including method blanks, blank spikes, matrix spikes, laboratory control samples (LCS), 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 contract. Other QC factors, such as sample preservation and holding times, were also assessed. The requirements for sample preservation and holding times are given in Standard Operating Procedure (SOP) ER-ERSS-SOP-5056, Sample Containers and Preservation. Evaluating these QC indicators allows estimates to be made of the accuracy, bias, and precision of the analytical suites. A focused data validation was also performed for all the data packages (identified by request number) that included a more detailed review of the raw data results. The procedures used for data validation are listed in Table B-1.0-1. Copies of the raw analytical data, laboratory logbooks, and instrument printouts are provided in data packages as part of Appendix C (on CD included with this document).

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines, where applicable (EPA 1999, 066649). Data have also been assessed using guidelines established in SW-846 (EPA 1997, 057589). As a result of the data validation and assessment efforts, qualifiers have been assigned to some of the analytical records.

B-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 EP-ERSS-SOP-5058, 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 Appendix C (on CD).

B-1.2 Sample Documentation

Establishing sample documentation acceptability, described in EP-ERSS-SOP-5058, is the first step toward verifying 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.

B-1.3 Sample Preservation

Sample preservation is the use of specific types of sample containers and preservation techniques, as described in EP-ERSS-SOP-5056, Sample Containers and Preservation. Sample preservation is mandatory for hazardous site investigations because the integrity of any sample decreases over time.

Physical factors (light, pressure, temperature, etc.), chemical factors (changes in pH, volatilization, etc.), 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.

B-1.4 Holding Time

Holding time, the maximum amount of time a sample can be stored without unacceptable changes in analyte concentrations, is described in EP-ERSS-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.

B-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.

B-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, multipeak pattern matching, and mass spectral library searches are tools for making analyte identification determinations.

B-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, and internal standards 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.

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

B-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 which 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 2000, 071233).

B-1.9 Matrix Spike Recoveries

A matrix spike is an aliquot of 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 2000, 071233).

B-1.10 Surrogate Recoveries

A surrogate (an organic chemical compound) is similar in composition and behavior to target analytes but is 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 2000, 071233).

B-1.11 Internal Standard Responses

Internal standards are chemical compounds that are 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 ≥50% to ≤200% (LANL 2000, 071233).

B-1.12 LCS Recoveries

An LCS is a known matrix that has been spiked with compound(s) that are 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 2000, 071233).

B-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) used to assess or demonstrate acceptable laboratory-method precision at the time of analysis. Each duplicate sample is equally representative of the original material. Duplicate analyses are also performed to generate data and to determine the long-term precision of an analytical method on various matrices. All relative percent differences (RPD) for laboratory duplicates should be within 20% (LANL, 2000 071233). Field duplicates are independent samples collected as closely as possible at the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently and should have RPDs less than 20% as described in EP-ERSS-SOP-5059. The RPD is defined by the equation RPD[|D1-D2|]/[(D1+D2)/2) × 100, where D1 and D2 represent the analytical measurements on duplicate samples.

Serial dilution checks are performed for certain inorganic analyses to determine if dilutions have been prepared correctly and to identify any effects that may arise from characteristics of the sample matrix.

For radionuclides, the duplicate error ratio (DER) may also be used to quantify precision. The DER is defined by the equation DER = |S–D| / sqrt(2σS^2 + 2σD^2), where S represents the original sample value, D represents the duplicate value, and 2σS and 2σD represent the 2-sigma uncertainties surrounding the original and duplicate samples, respectively. A DER below 3 indicates sample-to-duplicate precision that is in control.

B-1.14 Field Blanks

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.

B-2.0 LABORATORY ANALYSIS SUMMARY

During the first quarter fiscal year (FY) 2010, 28 pore-gas volatile organic compound (VOC) samples, 3 VOC field duplicates, 3 VOC field blanks, 3 VOC performance evaluation samples, 28 tritium samples, 3 tritium field duplicates, and 3 tritium field blanks were collected at Solid Waste Management Unit 54-004, also known as Material Disposal Area (MDA) H. Analyses for VOCs were performed using EPA Method TO-15 and for tritium using EPA Method 906.0. All QC procedures were followed as required by the analytical services SOW (LANL 2000, 071233). Table B-2.0-1 lists the analytical methods used for VOC and tritium analyses.

Sampling locations, sampling ports, and validated analytical results are presented in Tables 5.0-1 and 5.0-2 of the periodic monitoring report. The data, including the qualified data, are usable for evaluation purposes.

The tritium and VOCs analyses are summarized in the following sections. The required minimum detectable activity or estimated quantitation limit is prescribed in the analytical services SOW (LANL 2000, 071233).

B-3.0 ORGANIC CHEMICAL ANALYSES

All VOC data were accepted. No VOC data were rejected.

B-3.1 Maintenance of Chain of Custody

Chain of custody was properly maintained for all samples.

B-3.2 Sample Documentation

All samples were properly documented in the field.

B-3.3 Sample Preservation

No sample preservation is required for VOCs.

B-3.4 Holding Time

The holding times were met for all samples.

B-3.5 Initial and Continuing Calibration Verification

Initial calibration criteria were not met for 28 VOC results. Affected analytes were analyzed with an initial calibration curve that exceeded the percent standard deviation criteria and/or the associated multipoint calibration correlation coefficient was <0.995. Affected results were qualified as estimated not detected (UJ).

Initial and/or continuing calibration verification were recovered outside the method-specific limits for 28 VOC results. Affected results were qualified as estimated not detected (UJ).

B-3.6 Analyte Identification (Including Internal Standards, and Spectra Review)

Four sample results were detected at a concentration less than 5 times the concentration of the related analyte in the trip blank and were qualified as not detected (U),

B-3.7 Method Blank

Method blank results for VOC analyses were within acceptable limits for all results.

B-3.8 Surrogate Recoveries

All surrogate recoveries for VOC analyses were within acceptable limits.

B-3.9 Internal Standard Responses

All internal standard responses for VOC analyses were within acceptable limits.

B-3.10 LCS Recoveries

Laboratory control spike percent recoveries were outside acceptable limits for 38 sample results. The LCS percent recovery was less than the lower allowable limit but greater than 10%. Of the affected results, 10 were qualified as estimated biased low (J-), and 28 were estimated not detected (UJ).

B-3.11 Laboratory and Field Duplicates

Laboratory and field duplicates were within acceptable ranges for all samples.

B-3.12 Field Blanks and Equipment Blanks

One field blank collected on December 1, 2009, from borehole 54-15462 contained a detectable level of acetone at 10 µg/m^3 just above the standard quanititation limit of 9.8 µg/m^3.

Four sampling results were qualified as not detected (U) because the concentration of the analyte was ≤5 times the concentration for the related analyte in the trip blank.

B-4.0 RADIOCHEMICAL ANALYSES

One tritium result, collected on December 15, 2009 from borehole 54-15462 at 260.5 ft depth was rejected because the associated sample had a DER or relative error ratio greater than the analytical laboratories' acceptance limits.

B-4.1 Maintenance of Chain of Custody

Chain of custody was properly maintained for all samples.

B-4.2 Sample Documentation

Samples were properly documented in the field.

B-4.3 Analyte Identification

Ten tritium results were qualified as not detected (U) because the sample result was ≤ 5 times the concentration in the associated field blank. Six tritium results were qualified as not detected (U) because the sample concentration was less than the minimum detectable concentration (MDC).

B-4.3 Sample Preservation

No sample preservation is required for tritium.

B-4.4 Holding Times

The holding times were met for all tritium analyses.

B-4.5 Method Blanks

Method blank results were within acceptable limits for all tritium analyses.

B-4.6 LCS Recoveries

The LCS recoveries were within acceptable limits for all tritium analyses.

B-4.7 Laboratory Duplicates and Field Duplicates

Laboratory duplicate analyses indicate acceptable precision for all but nine tritium analyses. One result was qualified as not detected because the sample was detected at less than 3 times the 1 sigma uncertainty; it was also qualified as rejected because it had an associated DER greater than the analytical laboratories acceptance limits. Eight sample results were qualified as estimated (J) because they had DERs greater than the analytical laboratories' acceptance limits.

B-4.8 Field Blanks and Equipment Blanks

One field blank collected on December 16, 2009, from borehole 54-609985 had detectable levels of tritium. No associated field samples collected at 54-609985 had detectable concentrations of tritium.

B-5.0 FIELD-MONITORING SUMMARY

B-5.1 Volatile Organic Compounds

Field-monitoring data are less costly to generate than analytical laboratory data and are immediately available to guide field decisions. Field-monitoring results are generated by rapid methods of analysis that provide less precision than laboratory analyses. Field-monitoring data provide analyte (or at least chemical class) identification and quantification, although the quantification may be relatively imprecise.

Field monitoring of subsurface vapor monitoring at MDA H is conducted using guidance provided in ER-ERSS-SOP-5074, Sampling of Sub-Atmospheric Air. This procedure covers the use of the Brüel and Kjær (B&K) Type 1302 multigas analyzer and the Landtec GEM 500 photoionization detector (PID).

The B&K is maintained through calibration and changing or cleaning of filters as needed. The B&K is calibrated before use each quarter by a certified calibration laboratory. The B&K is adjusted before each day's use to compensate for ambient pressure and temperature. A daily operational check is conducted through the analysis of ambient air readings and triplicate readings of known quantities of organic analytes in nitrogen. These verification check analyses confirm analytical stability, the instrument zero point for each analyte is correctly set, and the stored calibration curve remains applicable to current instrument response to the presence of organic chemicals. Concentrations of gas standards analyzed before each day's use are expected to be within ±20% of their known values. Additionally, during each sample analysis, a low-sample flow condition will trigger an alarm on the B&K and the VOC measurement is not completed.

The presence of nontarget VOCs bias B&K target analytes may skew results if they have an acoustic response to infrared light similar to the target analyte. Trichlorofluoromethane (Freon-11) generates a measurable acoustic signal in response to light with a wavelength of 11.6 µm proportional to its concentration. Other VOCs generating an acoustic signal to light at this wavelength include (Freon-114) (Chemical Abstract Service [CAS] 76-14-2; 1,2-dichloro-1,1,2,2-tetrafluoroethane) and Freon-21 (CAS 75-43-4; dichlorofluoromethane), neither of which is reported by EPA Method TO-15. Tetrachloroethene (PCE) generates an acoustic signal in response to light with a wavelength of 11.1 µm. Other VOCs responding to light at this wavelength include styrene (CAS 100-42-5) and (Freon-113) (CAS 76-13-1, 1,1,2-trichloro-1,2,2-trifluoroethane), neither of which is reported by EPA Method TO-15; Freon-12 (CAS 75-71-8, dichlorodifluoromethane); ethanol (CAS 64-17-5); and 1,1-dichloroethylene (DCE) (CAS 75-35-4). Results indicate that DCE and Freon-113 are detected in most samples at MDA H at concentrations that generate a measurable acoustic signal in response to light with a wavelength included in the acoustic signal interpreted as PCE, which may make the PCE readings appear higher on the B&K. Table B-5.1-1 presents VOCs that interfere with each of the four B&K target analytes.

Data generated using the B&K Type 1302 are supported by calibration records that bracket the periods of analyses. Calibration information is reported below for the B&K Type 1302 photoacoustic analyzer used to generate results presented in this periodic monitoring report.

- On April 23, 2009, the B&K with serial number 1692083 was calibrated before the first quarter monitoring event. The zero points were set for 1,1,1-trichloroethane (TCA), trichloroethene (TCE), Freon-11, PCE, carbon dioxide (CO2), and water vapor. Span concentrations of TCA at 10.5 ppm, TCE at 9.2 ppm, Freon-11 at 22.1 ppm, PCE at 19.36 ppm, and CO2 at 2500 ppm were used to generate calibration response curves.
- After the first quarter FY2010 monitoring event, the B&K with serial number 1692083 was calibrated.

The Landtec GEM 500 PID is calibrated by a certified calibration laboratory. During calibration, methane (CH_4), oxygen (O_2), and CO_2 zero points are set, and each analyte's calibration response curve is developed. The CH_4 reading is filtered to an infrared absorption frequency of 3.41 mm (nominal), the frequency specific to hydrocarbon bonds. Landtec instruments are calibrated using certified CH_4 mixtures and will give correct readings, provided no other hydrocarbon gases present are present within the sample (e.g., ethane, propane, butane). If other hydrocarbons are present, the CH_4 reading will be higher (never lower) than the actual CH_4 concentration being monitored. The extent to which the CH_4 reading is affected depends upon the concentration of the CH_4 in the sample and the concentration of the other hydrocarbons. The effect of other hydrocarbons is nonlinear and difficult to predict. The CO_2 reading is filtered to an infrared absorption frequency of 4.29 μm (nominal), the frequency specific to CO_2. Therefore, any other gases usually found on landfill sites will not affect the CO_2 reading. The O_2 sensor is a galvanic cell type and suffers no influence from CO_2, hydrogen sulfide, nitrate, sulfide, or hydrogen.

Calibration of the Landtec GEM-500 PID is confirmed before each day's use through multiple readings of ambient air. Zero readings of CH_4 and CO_2 are expected. O_2 is expected to read 20.9%. The Landtec reads with an accuracy of +/-1% over an O_2% concentration range of 0–25%.

Data generated using the Landtec GEM-500 PID is supported by calibration records that arrive with the rented instrument before the period of analyses. Calibration is performed by Geotech's Colorado Service Center in Denver, CO. Calibration information is reported below for the Landtec PID used to generate results presented in this periodic monitoring report.

- Unit 937 was calibrated on October 19, 2009. The zero points were set for CH_4, CO_2, and O_2. Calibration was performed so that CH_4 and CO_2 reached ±15% of a known concentration, and O_2 was set to read ambient air at 20.9%. Pump flow was confirmed to be 525 cc/min.

B-5.2 Tritium

Silica gel is the medium used at the Laboratory to collect moisture from pore-vapor samples. This moisture is analyzed for tritium using liquid scintillation counting. Dry silica gel contains bound water, which dilutes the tritium sample. A correction factor for this dilution is developed for each sample based on the percent moisture value determined by the analytical laboratory (Marczak 2009, 106500; Whicker et al. 2009, 106429).

Silica gel is prepared for sampling by drying it at a temperature above 100^oC. This drying removes moisture from the silica gel but does not remove bound water. The amount of silica gel used in each sample is weighed before the sample is collected (typically about 135 g). The sample canister with silica gel is weighed before sampling. The sampling procedure, EP-ERSS-SOP-5074, Sampling of Sub-Atmospheric Air, requires collecting at least 5 g of moisture. After sampling, the sample canister with silica gel is weighed again to verify that 5 g of water vapor has been collected.

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

The correction factor for the impact of bound water is determined for each sample using the percent moisture value determined by the analytical laboratory (Marczak 2009, 106500). Tritium results presented in this report have been corrected for bound-water dilution.

B-6.0 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 New Mexico Environment Department 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),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), December 2000. "University of California, Los Alamos National Laboratory (LANL), I8980SOW0-8S, Statement of Work for Analytical Laboratories," Rev.1, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 071233)

Marczak, S., July 2009. "Technical Implementation of the Correction Factor Calculation for Tritium in Pore-Gas Data," Los Alamos National Laboratory document LA-UR-09-4629, Los Alamos, New Mexico. (Marczak 2009, 106500)

Whicker, J.J., J.M. Dewart, S.P. Allen, W.F. Eisele, M.C. McNaughton, and A.A. Green, June 17, 2009. "Corrections for Measurement of Tritium in Subterranean Vapor Using Silica Gel," Los Alamos National Laboratory document LA-UR-09-03837, Los Alamos, New Mexico. (Whicker et al. 2009, 106429)

Table B-1.0-1
Data Validation Procedures

Procedure	Title	Effective Date
SOP-1561, Rev. 0	Routine Validation of Volatile Organic Compound (VOC) Analytical Data	6/10/2008
SOP-1566, Rev. 0	Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data	6/30/2008

Table B-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 SOW (LANL 2000, 071233)
EPA Method 906.0	Tritium in pore gas	Tritium

Table B-3.0-1
B&K Target Analytes
and Potential Interfering Analytes

Target	Potential Interfering Analyte
PCE	Styrene
PCE	Freon-113
PCE	Freon-12
PCE	DCE
PCE	Ethylene oxide
PCE	Ethanol
PCE	Dipropylnitrosamine
PCE	1,1-Dimethylhydrazine
PCE	1,4-Diethylene dioxide
PCE	Cyclohexene
PCE	tert-Butyl alcohol
PCE	m-Vinyltoluene
PCE	Vinyl chloride
PCE	Tetrahydrofurane
PCE	Silicium tetrafluoride
PCE	Nitromethane
PCE	Nitrogen trifluoride
PCE	α-Methylstyrene
PCE	Monomethyl hydrazine
PCE	Methyl iodide
PCE	n-Hexane
PCE	Acetic anhydride
PCE	1,3-Butadiene
Freon-11	Freon-114
Freon-11	Freon-21
Freon-11	Carbonyl sulphide
Freon-11	Methyl acetate
Freon-11	Chloropicrine
Freon-11	Cyclohexane
Freon-11	Dimethylnitrosamine
Freon-11	Epichlorohydrine
Freon-11	Ethane
Freon-11	Ethylene oxide
Freon-11	Ethyl formate
Freon-11	2-Nitropropane

Table B-3.0-1 (continued)

Target	Potential Interfering Analyte
Freon-11	Phosgene
Freon-11	Vinyl acetate
TCA	Fluorobenzene
TCA	Ethyl benzene
TCA	Dimethyl formamide
TCA	Dichloromethane
TCA	1,2-Dichloroethane
TCA	o-Dichlorobenzene
TCA	Dibutyl phthalate
TCA	Chloromethane
TCA	m-Xylene
TCA	1,1,2-Trichloroethane
TCA	o-Toluidine
TCA	Toluene
TCA	Phenol
TCA	Chlorobenzene
TCA	Carbon dioxide
TCA	Boron trifluoride
TCA	Aniline
TCA	Acetophenone
TCA	Hydrogen cyanide
TCA	n-Heptane
TCE	Arsine
TCE	Butanone
TCE	1,2-Difluoroethane
TCE	Diethyl ketone
TCE	Dinitrogendifluoride
TCE	2-Pentanone
TCE	2-Propanol
TCE	Sulfur hexafluoride
TCE	Vinyl chloride

Appendix C

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