Sandia National Laboratories/New Mexico
Environmental Restoration Project

INVESTIGATION REPORT ON THE SOIL-VAPOR VOLATILE ORGANIC COMPOUNDS, TRITIUM, AND RADON SAMPLING AT THE MIXED WASTE LANDFILL

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EXECUTIVE SUMMARY

The Mixed Waste Landfill (MWL) is designated as a Solid Waste Management Unit at Sandia National Laboratories/New Mexico (SNL/NM). SNL/NM is located within the boundaries of Kirtland Air Force Base, immediately south of the City of Albuquerque in Bernalillo County, New Mexico. SNL/NM is managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy.

The MWL is located 4 miles south of SNL/NM's central facilities and 5 miles southeast of Albuquerque International Sunport. The landfill is a fenced, 2.6-acre site in the north-central portion of Technical Area III. The MWL was established in 1959 as a disposal area for low-level radioactive waste generated by SNL/NM research facilities. Low-level radioactive and minor amounts of mixed waste were disposed of at the MWL from March 1959 through December 1988. Approximately 100,000 cubic feet of low-level radioactive and mixed waste containing approximately 6,300 curies of activity were disposed of in the landfill.

Active soil-vapor volatile organic compound (VOC) samples, tritium soil samples, and radon samples were collected at the MWL in 1994, 1995, and 1997, respectively. In order to determine whether subsurface conditions at the MWL had changed since the mid-1990s, the New Mexico Environment Department (NMED) required that additional soil-vapor VOC and methane, tritium soil, and radon samples be collected at the site. A sampling and analysis plan describing the required sampling activities was approved by the NMED with modifications in February 2008, and the fieldwork for this investigation was completed at the site in April and May 2008.

A comparison of the 1997 and 2008 surface radon samples shows that radon emissions from the MWL and background areas have not significantly changed from 1997 to 2008. The maximum radon values at the MWL were 1.0 picocurie per meter squared per second (pCi/m^{2}s) in 1997 and 0.43 pCi/m^{2}s in 2008. The 2008 radon sampling data also confirmed that radon gas being released from the MWL is below background levels.

Because none of the 2008 tritium samples were collected from the same locations that were sampled in 1995, a direct comparison of the 1995 and 2008 tritium concentrations was not possible. However, in general, tritium concentrations in the majority of the 2008 samples are higher than those in the 1995 samples. The highest tritium concentrations were 7.80E+06 picocuries per liter (pCi/L) in 1995 and 3.95E+07 pCi/L in 2008. All of the 1995 tritium samples were collected from boreholes around the perimeter of the MWL, whereas 20 out of 24 of the 2008 samples were collected from the interior of the MWL. The overall higher tritium concentrations found in the 2008 samples were expected because most of these samples were collected in close proximity to waste pits and trenches in the landfill.

A risk assessment evaluation was performed based on the maximum tritium concentration detected in the 2008 samples. The calculated dose values for the hypothetical residential and industrial land-use scenarios (4.5E-01 and 6.7E-04 millirem per year [mrem/yr], respectively) are two to four orders of magnitude less than the respective dosage guidelines (75 and 15 mrem/yr, respectively). The risk assessment calculations show that the tritium concentrations at the MWL pose no threat to human health or the environment.

The 1994 and 2008 soil-vapor samples were not collected from the same locations; therefore a direct comparison of the 1994 and 2008 results was also not possible. However, in general, the 1994 and 2008 soil-vapor results for three individual VOCs that were detected at the highest concentrations in the 1994 and 2008 samples, as well as the 1994 and 2008 total VOC concentrations show that overall concentrations have declined substantially at the MWL since 1994. The maximum total VOC concentration detected in 1994 was 3.07E+04 parts per billion by volume (ppbv), and in 2008 it was 1.33E+03 ppbv. The 2008 soil-vapor samples were also analyzed for methane, which was not done in 1994. The maximum methane concentration is 2.30E+05 ppbv.

Because the findings of this investigation are consistent with the conceptual model of the MWL, the cover should be constructed. Radon and tritium surface sampling should be continued, and deeper vadose zone soil-vapor sampling should be completed, as described in the “Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill, Sandia National Laboratories/New Mexico” (September 2007a).

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ACRONYMS AND ABBREVIATIONS

AOP	Administrative Operating Procedure
AR/COC	analysis request/chain-of-custody
BA	butyl acetate
bgs	below ground surface
CFC-12	dichlorodifluoromethane
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CVR	Contract Verification Review
DI	deionized
DOE	U.S. Department of Energy
DP	direct-push
EB	equipment blank
EDD	Electronic Data Deliverable
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ERG	Environmental Restoration Group, Inc.
°F	degrees Fahrenheit
GPS	global positioning system
HASP	Health and Safety Plan
HWB	Hazardous Waste Bureau
ID	identification number
LLW	low-level radioactive waste
LTMMP	Long-Term Monitoring and Maintenance Plan
MDL	method detection limit
mrem/yr	millirem per year
MWL	Mixed Waste Landfill
ND	not detected
NMED	New Mexico Environment Department
NOD	Notice of Disapproval
PCE	tetrachloroethene
pCi/g	picocurie(s) per gram
pCi/L	picocurie(s) per liter
pCi/m^2s	picocurie(s) per meter squared per second
PID	photoionization detector
ppbv	parts per billion by volume
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RFI	RCRA Facility Investigation
RPD	relative percent difference

ACRONYMS AND ABBREVIATIONS (Concluded)

Sandia	Sandia Corporation
SNL/NM	Sandia National Laboratories/New Mexico
SOW	statement of work
SV SAP	Soil-Vapor Sampling and Analysis Plan
TA	Technical Area
TB	trip blank
TCE	trichloroethene
TEDE	total effective dose equivalent
TWD	Technical Work Document
VOC	volatile organic compound

1.0 INTRODUCTION

The Mixed Waste Landfill (MWL) at Sandia National Laboratories/New Mexico (SNL/NM) is a Solid Waste Management Unit undergoing corrective action in accordance with the Resource Conservation and Recovery Act (RCRA) regulations (Title 40, Code of Federal Regulations [CFR], Part 260); the New Mexico Secretary of the Environment Department's Final Order in the Matter of Request for a Class 3 Permit Modification for Corrective Measures for the Mixed Waste Landfill No. HWB 04-11(M) (Curry May 2005); the New Mexico Environment Department (NMED) Class 3 Permit Modification for the MWL (NMED August 2005); and the Compliance Order on Consent (the Order) (NMED April 2004).

SNL/NM is located within the boundaries of Kirtland Air Force Base, adjacent to the City of Albuquerque in Bernalillo County, New Mexico (Figure 1-1). SNL/NM is managed and operated by Sandia Corporation (Sandia), a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy (DOE). The MWL is located 4 miles south of SNL/NM's central facilities and 5 miles southeast of Albuquerque International Sunport. The landfill is located in the north-central portion of Technical Area (TA)-III at SNL/NM (Figure 1-2).

The MWL accepted containerized and uncontainerized low-level radioactive waste (LLW) and minor amounts of mixed waste from SNL/NM research facilities and off-site DOE and U.S. Department of Defense generators from March 1959 to December 1988. Approximately 100,000 cubic feet of LLW (excluding packaging, containers, demolition and construction debris, and contaminated soil) containing 6,300 curies of activity (at the time of disposal) were disposed of at the MWL.

Two distinct disposal areas are present at the MWL: the classified area (occupying 0.6 acres) and the unclassified area (occupying 2.0 acres) (Figure 1-3). Wastes in the classified area were disposed of in a series of vertical, cylindrical pits. Historical records indicate that early pits were 3 to 5 feet in diameter and 15 feet deep; later pits were 10 feet in diameter and 25 feet deep. Once pits were filled with waste, they were backfilled with soil and capped with concrete. Wastes in the unclassified area were disposed of in a series of parallel, north-south trenches. Records indicate that trenches were 15 to 25 feet wide, 150 to 180 feet long, and 15 to 20 feet deep. Trenches were backfilled with soil on a quarterly basis and, once filled with waste, were capped with the original soil that had been excavated and locally stockpiled. None of the pits or trenches were lined.

Containment and disposal of routine waste commonly occurred using tied, double-polyethylene bags, sealed A/N cans (military ordnance metal containers of various sizes), fiberboard drums, wooden crates, cardboard boxes, and 55-gallon steel and polyethylene drums. Larger items, such as glove boxes, spent fuel shipping casks, and contaminated soil, were disposed of in bulk without containment. With the exception of a one-time disposal of coolant water to Trench D, disposal of free liquids at other disposal pits and trenches was not allowed at the MWL. Liquids such as acids, bases, and solvents were solidified with commercially available agents before containerization and disposal (SNL/NM September 2007a). A detailed MWL waste inventory, by pit and trench, is provided in the Environmental Restoration (ER) Project "Responses to NMED Technical Comments on the Report of the Mixed Waste Landfill Phase 2 RCRA Facility Investigation [RFI] Dated September 1996" (SNL/NM June 1998).

A Phase 1 RFI was conducted in 1989 and 1990 to determine whether a release of RCRA contaminants had occurred at the MWL (SNL/NM September 1990). A Phase 2 RFI was conducted from 1992 to 1995 to determine the contaminant source, define the nature and extent of contamination, identify potential contaminant transport pathways, evaluate potential risks posed by the levels of contamination identified, and provide remedial action alternatives for the landfill. Analytical results for the Phase 2 RFI were presented and discussed in the "Report of the Mixed Waste Landfill Phase 2 RCRA Facility Investigation, Sandia National Laboratories, New Mexico" (SNL/NM September 1996). Both investigations revealed that tritium had migrated from the pits and trenches of the MWL. Results of the Phase 2 RFI soil and soil-vapor investigations are further discussed in Chapters 2.0 and 6.0.

The work completed for this 2008 field investigation was based upon requirements set forth in a Notice of Disapproval (NOD) letter dated November 20, 2006 (NMED November 2006) on the MWL Corrective Measures Implementation (CMI) Plan that was prepared by the DOE/Sandia and submitted to the NMED Hazardous Waste Bureau (HWB) in November 2005 (SNL/NM November 2005). Among other comments, the NMED HWB disapproval letter included a requirement for additional sampling at the landfill. The NMED was concerned that most of the site characterization data for the MWL was collected prior to the mid-1990s, and more current data were required to ensure that conditions had not changed.

To meet the NMED requirements, samples were collected and analyzed in April and May 2008. These samples were collected at 20 locations in and near the landfill and analyzed for radon (12 locations at the current land surface); tritium (8 locations at depths of 10, 30, or 50 feet below ground surface [bgs]); and volatile organic compounds (VOCs) and methane (8 locations at depths of 10, 30, or 50 feet bgs). As used in this report (and described in detail in Chapter 4.0), "radon samples" are gas samples collected in radon-flux canisters and analyzed using U.S. Environmental Protection Agency (EPA) Method 115 (EPA April 1996). "Tritium samples" are soil-moisture samples (incorporated in a soil matrix) collected in plastic sleeves and analyzed using EPA Method 906.0 (EPA August 1980). "VOC/methane samples" refer to soil-vapor samples that were collected in SUMMA™ canisters and analyzed using EPA Method TO-14A (EPA January 1999).

The outline of this report is based upon the required elements of an "Investigation Report" described in Section X.C of the Order (NMED April 2004):

- Chapter 2.0 discusses background information of pertinent earlier studies at the MWL.
- Chapter 3.0 presents the regulatory requirements for the work performed during the 2008 investigation.
- Chapter 4.0 describes the pre-fieldwork activities as well as the procedures used during the collection of the samples.
- Chapter 5.0 discusses the analytical results of the 2008 investigation.
- Chapter 6.0 compares the analytical data from the 2008 and mid-1990s previous investigations and incorporates the results into a current conceptual model of site contamination.

- Chapter 7.0 provides recommendations for future site activities based upon the current understanding of the distribution of contaminants at the site.
- The report figures, tables, and appendices are provided at the end of the document.

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2.0 PREVIOUS INVESTIGATIONS

This chapter summarizes three investigations that have been conducted at the MWL for VOCs, tritium, and radon prior to the 2008 investigation.

2.1 1994 Soil-Vapor Investigation

Active soil-vapor samples were collected from 43 locations in and around the MWL from June to October 1994. Soil-vapor samples were retrieved from target depths of 10 and 30 feet bgs with Geoprobe® soil-vapor collection equipment at each location and collected in both 500-milliliter glass bulbs and SUMMA™ canisters. The glass-bulb samples were analyzed with an on-site gas chromatograph/mass spectrometer, and the SUMMA™-canister samples were analyzed by an off-site commercial laboratory for VOCs by EPA Method TO-14A (EPA January 1999).

Analytical results from the 1994 active soil-vapor samples were presented and discussed in the Phase 2 RFI report (SNL/NM September 1996). Eight individual VOCs were detected in the 10- and 30-foot samples, with total VOC concentrations ranging from 30 to 3.07E+04 parts per billion by volume (ppbv) in the 10-foot-bgs samples, and from 107 to 2.77E+04 ppbv in the 30-foot-bgs samples. The 1994 soil-vapor borehole locations and sampling results are discussed in Chapter 6.0.

2.2 1995 Tritium Investigation

Soil samples were collected from 15 boreholes drilled with a resonant sonic drill rig around the perimeter of the MWL from April through June 1995. Boreholes 1 to 13 were drilled adjacent to the MWL fence at a 30-degree angle, and Boreholes 14 and 15 were drilled vertically 60 feet east of the classified area fence. Boreholes were drilled to a minimum target depth of 120 linear feet. Samples for tritium analysis were obtained every 20 linear feet in the boreholes beginning at 10 feet and continuing to total depth.

A total of 120 surface and subsurface soil samples were collected for tritium analysis. The samples were analyzed by Lockheed Analytical Services using Method LAL-91-SOP-0066. Tritium concentrations ranged from not detected (ND) to 7.80E+06 picocuries per liter (pCi/L) in the samples. Analytical results for the 1995 subsurface tritium soil samples are also presented in the Phase 2 RFI report (SNL/NM September 1996). The 1995 tritium soil borehole locations and sampling results are discussed in Chapter 6.0.

2.3 1997 Radon Investigation

Radon was measured using activated charcoal radon canisters at the MWL from September 30 to October 1, 1997. A total of 71 canisters were placed on the surface of the MWL, and an additional 18 canisters were placed at perimeter locations outside of the MWL fence. The radon canisters were analyzed by Thermo NUtech using gamma spectroscopy. Analytical results for the 1997 radon flux measurements ranged from 0.026 to 1 picocurie per meter squared per second (pCi/m^{2}s) and were presented in a report titled “Radon flux testing at the Mixed Waste

and the adjacent Classified Waste Landfills, Technical Area III, SNL/NM" (SNL/NM January 1998). The 1997 radon canister sampling locations and results are discussed in Chapter 6.0.

3.0 REGULATORY CRITERIA

This chapter addresses the regulatory criteria for this MWL investigation. The MWL CMI Plan was submitted to the NMED HWB in November 2005 (SNL/NM November 2005). The NMED HWB issued an NOD dated November 20, 2006 (NMED November 2006), which listed a number of deficiencies related to the MWL cover construction plans, performance modeling, fate and transport model, and monitoring triggers.

3.1 NMED Requirements

The NMED NOD for the MWL CMI Plan included a requirement for additional soil-vapor sampling at the landfill, as follows:

> As the Permittees are aware, most site characterization data for the MWL (other than groundwater data) dates before the mid 1990's. Because the rupturing of containers and leaking of their contents could have occurred since the mid 1990's, the NMED requires more current soil-gas data to help resolve this issue. The Permittees shall therefore collect and analyze active soil-gas samples taken at depths of 10 and 30 feet at a minimum of three locations within the landfill where previous sampling has detected the highest soil-gas concentrations in the past. The soil-gas samples shall be analyzed for volatile organic compounds, tritium, and radon. Pursuant to Section VI.A of the Order on Consent (April 29, 2004), the Permittees shall provide for approval to the NMED within 30 days of receipt of this letter a work plan to conduct the active soil-vapor sampling described above. The work plan shall be prepared in accordance with Section X.B of the Consent Order. (NMED November 2006).

The DOE/Sandia submitted a response to the NOD that included a work plan for the required VOC, tritium, and radon sampling titled, "Sampling and Analysis Plan for Soil-Gas Volatile Organic Compounds, Tritium, and Radon at the Mixed Waste Landfill" (SNL/NM December 2006).

Based upon the NMED review of the Soil-Vapor Sampling and Analysis Plan (SV SAP), and in consideration of public comments received, the NMED approved the SV SAP with modifications (NMED February 2008). The approval letter is provided in Appendix A. The modifications included the following:

- Six boreholes for the collection of soil-vapor and soil samples shall be drilled at the locations shown on a map provided by the NMED (Appendix A). Two other boreholes may be drilled at the background locations as proposed in the SV SAP.

- Soil-vapor and soil samples for VOC and tritium analysis, as appropriate, from three designated boreholes shall be collected at depths of 10, 30, and 50 feet. All other samples shall be collected at depths of 10 and 30 feet.

- The track-etch type radon detectors proposed in the SV SAP are not the same type used in the 1997 survey at the MWL. To ensure that radon data are directly comparable with the 1997 data, the DOE/Sandia shall use the same type of detector used in the 1997 survey.

- Nine radon detectors shall be deployed at locations shown on a map provided by the NMED (Appendix A).
- The radon data shall be submitted at the same time as the tritium and VOC data.
- In addition to VOCs, all soil-vapor samples shall be analyzed for methane.
- The report shall be submitted by a specified due date (that was subsequently extended).

Tritium soil sampling analytical results are included in this report and are provided voluntarily by the DOE/Sandia. The voluntary inclusion of such radionuclide information shall not be enforceable and shall not constitute the basis for any enforcement because such information falls wholly outside the requirements of the Order. Additional information on radionuclides and the scope of the Order is available in Section III.A of the Order (NMED April 2004).

3.2 Report Organization

This report satisfies the reporting requirements as defined in the Order (NMED April 2004). The following table provides a cross-reference of each NMED report requirement and its correlation to sections within this document:

Required Elements of an Investigation Report (NMED April 2004)	Investigation Report on the Soil-Vapor VOCs, Tritium, and Radon Sampling at the MWL
1. Title Page and Signature Block (for the name, title, and organization of the preparer and the responsible DOE and Sandia Corporation representative)	Title Page Signatures for full SNL/NM and DOE chain-of-command on the transmittal document that accompanies the report from SNL/NM to the DOE to the NMED
2. Executive Summary	Executive Summary
3. Table of Contents	Table of Contents
4. Introduction	Chapter 1.0 Introduction
5. Background Information	Chapter 2.0 Previous Investigations
6. Scope of Activities	Chapter 4.0 Scope of Activities
7. Field Investigation Results	Chapter 5.0 2008 Field Investigation Results
8. Regulatory Criteria	Chapter 3.0 Regulatory Criteria
9. Site Contamination	Chapter 6.0 Summary of Results and Comparison of Investigations
10. Recommendations	Chapter 7.0 Recommendations
11. Tables	Tables 4-1, 4-2; 5-1 through 5-11; 6-1, 6-2, and 6-3
12. Figures	Figures 1-1, 1-2, 1-3; 4-1 through 4-4; 5-1 through 5-6; and 6-1 through 6-10
13. Appendices	Appendices A through E

4.0 SCOPE OF ACTIVITIES

This chapter describes the pre-fieldwork activities as well as procedures used during the collection of the radon, tritium, and VOC/methane samples.

4.1 Pre-Fieldwork Planning and Preparation

Planning and preparation for the fieldwork commenced immediately after SNL/NM received NMED approval of the modified SV SAP (Appendix A). The following lists the various plans, permits, and health and safety-related documents that were completed prior to the start of fieldwork:

- SNL/NM Excavation Permit (for identification of underground utilities)
- SNL/NM site-specific Health and Safety Plan (HASP)
- Programmatic and site-specific HASPs provided by the Geoprobe® contractor
- SNL/NM Preliminary Hazard Screening documents for sampling and waste management
- Radiological Work Permit and Technical Work Document (TWD) to address radiological health and safety issues at the site
- Contractor statement of work (SOW)
- SNL/NM Field Implementation Plan
- Biological survey to ensure that project activities would not significantly impact wildlife in the project area
- National Environmental Policy Act review and approval
- Safety inspection of Geoprobe® equipment
- Waste management plan and TWD, to address characterization and management of waste (soil, personal protective equipment [PPE]), and miscellaneous debris) generated as a result of project activities
- Analytical Laboratory SOW/Sampling Bottle Order

4.2 Sample Specifications and Locations

In the February 2008 approval letter (Appendix A), the NMED specified locations for radon, tritium, and VOC/methane samples; these locations are shown in Figure 4-1. To determine field locations, SNL/NM ER Project personnel digitized the NMED-specified locations, generated

New Mexico State Plane coordinates, and used global positioning system (GPS) equipment to place pin flags in the ground. For tritium and VOC/methane sampling, multiple direct pushes were required to retrieve the required sample volume (discussed in Section 4.4.1). All multiple direct pushes for a single location were placed within several feet of the original GPS-located pin flag.

For radon samples, the NMED required nine locations (RN1 through RN9) in the MWL. Duplicate radon samples were also collected adjacent to primary locations at RN1 and RN8, with a triplicate sample collected at RN3. For comparison purposes, three background samples (RN10 through RN12) were also collected at locations northwest, northeast, and southeast of the MWL outside the surface water pollution prevention earth berm that surrounds the MWL (Figure 4-1). Table 4-1 summarizes the sampling specifications for the radon samples. As shown in the table, each radon sample was identified with a unique location identification number (ID).

The NMED required six direct-push (DP) locations (DP1 through DP6) for tritium and VOC/methane samples within the MWL footprint, and two additional background locations (DP7 and DP8) southwest of the MWL. Five of the tritium and VOC/methane sampling locations were to be drilled to a depth of 30 feet bgs, and three were pushed to a depth of 50 feet below the original MWL surface grade (discussed in Section 4.4).

In order to protect site workers and to avoid potentially contacting buried waste, the NMED allowed a slight adjustment to the NMED-approved locations in the landfill of a maximum horizontal distance of 20 feet. After reviewing maps of waste burial locations (SNL/NM September 2007a), the locations for DP2 and DP3 were moved 20 feet west and 15 feet southwest, respectively, of the NMED-approved locations. The other four boring locations in the MWL were drilled at the NMED-approved locations. DP7 and DP8 were located approximately 525 and 665 feet, respectively, southwest of the MWL (Figure 4-1).

Table 4-2 summarizes the specifications and requirements for the tritium and VOC/methane samples. As shown in Table 4-2, samples were identified with a unique location ID, and duplicate samples were collected from Boreholes DP5 and DP6. In addition, aqueous equipment blank (EB) samples were collected during tritium sampling.

4.3 Radon Sampling

Radon sampling was conducted on April 1 and April 2, 2008, at 12 locations in and near the MWL.

4.3.1 Radon Sample Collection Procedures

As shown in Figure 4-1, sampling for radon using activated charcoal radon canisters was conducted at nine locations in the landfill and at three background locations outside of the MWL. For comparability of data, the same type of radon-flux detection canisters were used for both the 1997 and 2008 sampling events. The 8-inch-diameter radon canisters used for the 2008 sampling event were provided by Environmental Restoration Group, Inc. (ERG) located in Albuquerque, New Mexico.

On April 1, 2008, personnel from ERG and the SNL/NM ER Project placed a total of 16 radon canisters. The field crew placed primary canisters at nine locations, duplicate canisters at two locations, and triplicate canisters at one location in the MWL. In addition, canisters were placed at three background locations. The canisters were removed from the site by the field crew on April 2, 2008.

The radon-flux canisters were required to remain in position for a minimum of 24 hours, and actually remained on site for approximately 25 hours (from approximately 11 a.m. on April 1 to 12 p.m. on April 2). The radon analytical results (discussed in Section 5.1.1) are reported as flux, or the rate of concentration through an area, per unit time in pCi/m^2s. Therefore, the field crew was required to accurately measure and record the canister exposure time. To operate effectively and accurately, the radon canisters require dry conditions and temperatures above 35 degrees Fahrenheit (°F). During the canister exposure time, no precipitation was reported, and the temperature never fell below 35°F. In addition, 1 trip blank (TB) canister was included with the batch and analyzed (counted) with the other 16 canisters.

4.3.2 Radon Sample Analysis

The 17 canisters (including the TB) were analyzed at the ERG laboratory in Albuquerque, New Mexico, using EPA Method 115 (EPA April 1996). The EPA Method requirements were met for the measurements. In accordance with method quality assurance requirements, two independent standard charcoal sources (each containing a known quantity of radium-226) were used to calibrate the spectrometer, using identical geometry conditions to that of the canisters. The agreement between the two calibration factors was sufficient to meet quality assurance criteria (ERG April 2008, Appendix B).

4.4 Tritium Soil Sampling

The Geoprobe® sampling system was selected for tritium and VOC/methane sampling because, compared to hollow-stem auger or air-rotary drilling techniques, Geoprobe™ sampling techniques produce far less waste soil and minimize contaminant exposures to site workers and the environment. All materials retrieved from the subsurface with the Geoprobe® sampling system are fully contained in the butyl acetate (BA) sampling sleeves. In contrast, conventional drilling produces cuttings that could expose contaminants to site personnel or the environment, especially during windy conditions.

Tritium soil sampling activities occurred from April 8 through April 11, 2008, and May 5 through May 27, 2008. The field program took considerably more time to complete than originally expected; as a consequence, the sampling activities were conducted during two different time periods.

The elevation of the MWL land surface that existed in 1995 (hereafter referred to as the “original grade”) had been modified by the recently installed subgrade soil layer (SNL/NM November 2005). The thickness of the subgrade soil layer was accounted for during the 2008 field program to facilitate collecting samples from depths similar to those collected in 1995. The ER Geographic Information System personnel provided data that were used to calculate the location-specific depths to the original grade. The depth to the original grade at the sampling locations ranges up to 2.5 feet below the current MWL land surface.

As shown in Table 4-2, tritium samples were collected from three locations in the MWL at depths of 10 and 30 feet below the original grade and from three locations (DP2, DP3, and DP5) at depths of 10, 30, and 50 feet below the original grade. Samples from the two background locations were collected at depths starting at 10 and 30 feet bgs.

4.4.1 Tritium Sample Collection Procedures

Tritium samples were collected with a large, track-mounted, direct-push (Geoprobe®) Model 6620 DT rig provided by Earth Worx Environmental Services, LLC of Los Lunas, New Mexico (Figure 4-2). The Geoprobe® rig and related equipment were initially decontaminated with a pressure washer at the decontamination facility in TA-III prior to sampling operations. Soil samples were collected with a 4-foot-long by 1-inch inside diameter Geoprobe® sampling tube lined with a BA sampling sleeve.

The tritium analysis measures concentrations of tritium in soil moisture. Because of the relatively dry subsurface soil conditions in and around the MWL, a minimum of 2 liters of soil was required by the analytical laboratory. In order to obtain 2 liters of soil, a minimum of approximately 13 linear feet of soil-filled BA sleeves was required at each sampling depth interval. Therefore, each sampling interval required a minimum of four 4-foot-long direct pushes. Commonly, the BA sleeves were not completely filled with soil after a direct push into the sampling interval; therefore multiple direct pushes were required at one sampling location. In most cases, up to six direct pushes were necessary to meet the sample volume requirements.

The Geoprobe® soil sample collection procedure is described as follows:

- A solid, steel plug is fitted into the drive shoe at the bottom of the steel sampling tube.
- The tube is driven in a direct push (in the closed position) to either the top of the first designated sampling interval or until subsurface refusal occurs (typically at 7 or 8 feet below the original grade). At depth, the steel plug is removed, and the sampling tube is fitted with a BA sleeve.
- The now-opened sampling tube with the BA sleeve is then driven with the hydraulic hammer in a direct push to the top of the first sampling interval (10 feet below the original grade).
- The BA sleeve is retrieved from the borehole, and waste soil that has collected in the BA sleeve above or below the designated sampling interval is emptied into a waste soil drum at the site.
- The steel sampling tube is fitted with a new BA sleeve and then driven a total of 4 feet into undisturbed soil to collect the soil sample.
- The partially or completely soil-filled BA sleeve is retrieved, and the unfilled portion of the 4-foot BA sleeve is cut off with plastic cutting shears.

- The remaining filled portion of the sleeve is immediately capped with rubber end caps and sealed with tape.
- The soil-filled BA sleeve was scanned for radiological contamination as described in Section 4.6 (Figure 4-3).

Multiple direct pushes were completed using this procedure at each sampling location until the 2-liter sample volume was collected. Additional direct pushes were necessary to collect the NMED-required duplicate soil samples at two of the six MWL locations (DP5 and DP6). Duplicate soil samples were collected from the same depths as the corresponding primary soil samples. The soil samples consisted of slightly damp to dry, compacted fine sand, silty sand, and silt. A 2 to 3-foot-thick layer of rocky, caliche-rich soil that was difficult to penetrate was encountered in the six MWL borings at depths starting at 25 to 30 feet, depending on the location.

Reusable Geoprobe® sample collection equipment was decontaminated in the following manner:

- After each direct push, the reusable steel drive shoe is detached, and any excess soil adhering to the shoe is removed with a wire brush as a dry decontamination method.
- The drive shoe is then decontaminated inside and out with a heavy paper wipe moistened with deionized (DI) water.
- The decontaminated shoe is then attached to the sampling tube, and another sampling run is completed. This is repeated for all direct pushes at a sampling location.
- After the last direct push is completed at a location, the drive shoe, sampling tube, and drive pipe are all decontaminated using heavy paper wipes moistened with DI water.
- The decontaminated equipment is then transported to the next location.

4.4.2 Tritium Sample Analysis

Aqueous EB samples were collected and analyzed for tritium by pouring DI water through a decontaminated sampling tube drive shoe and collecting the rinsate in the appropriate sample container.

In order to prevent the loss of soil moisture during transfer into bottles, the samples were shipped in the capped BA sleeves. Tritium EB and soil samples were shipped to the analytical laboratory (General Engineering Laboratories, Inc. in Charleston, South Carolina) with an analysis request/chain-of-custody (AR/COC) form containing the sample ID, sampling location, date, time, and depth. The soil and EB samples required no special preservation during transport and storage and were analyzed for tritium by EPA Method 906.0 (EPA August 1980).

All analytical data provided by the laboratory were reviewed and validated according to “Data Validation Procedure for Chemical and Radiochemical Data,” Administrative Operating Procedure (AOP) 00-03, Rev. 02 (SNL/NM July 2007).

4.5 VOC/Methane Sampling

VOC/methane sampling activities occurred during April 9 and April 10, 2008, at the two background locations, DP7 and DP8, and from May 8 to May 27, 2008, at the remaining six locations (DP1 through DP6) in the MWL. As shown in Figure 4-1 and Table 4-2, VOC/methane samples were collected from the same sampling locations and starting sampling depths as the tritium samples. The VOC/methane locations were also specified by the NMED (NMED February 2008). To avoid potentially drilling through buried waste, the sampling locations DP2 and DP3 were relocated 20 feet west and 15 feet southwest, respectively, from their NMED-designated locations.

4.5.1 VOC/Methane Sample Collection Procedures

VOC/methane sampling was conducted in accordance with procedures specified in SNL/NM Field Operations Procedure 94-21 “Shallow Soil Gas Sampling” (SNL/NM March 1994). VOC/methane samples were collected with the same Geoprobe® rig used for soil sample collection. The soil-vapor sampling equipment was initially decontaminated at the TA-III decontamination pad prior to collecting VOC/methane samples.

At each sampling location, the following procedures were used to collect the VOC/methane samples:

- A reusable steel drive-point tip is attached to the steel drive pipe, and the tip and drive pipe are pushed to the desired sampling depths (10, 30, or 50 feet below the original grade of the MWL, and 10 and 30 feet bgs at the two background locations) using the Geoprobe® hydraulic hammer (Figure 4-4).

- At the designated sampling depth, the drive pipe is extracted approximately 6 inches to create a void between the tip and drive pipe that exposes the sampling equipment to the open borehole.

- A new piece of ¼-inch-diameter polyethylene tubing is inserted into the drive pipe and attached to the steel drive point.

- The tubing is then connected to a vacuum pump and the line is purged to remove stagnant gas from the sampling port and tubing.

- A minimum of 1 cubic foot (28.3 liters) of soil-vapor is purged from the sampling tubing and formation. During presample purging, soil-vapor is continuously screened for VOCs with a photoionization detector (PID) containing an ultraviolet lamp with an ionization potential of 11.8 electron volts. (No VOCs were detected during field screening at any sampling interval at the VOC/methane locations.)

- The pressure gauge on each 6-liter SUMMA™ canister is checked to confirm that the canister has not leaked since it left the laboratory. Each SUMMA™ canister contains the proper presample vacuum of minus 26 inches of mercury.

- The SUMMA™ canister is filled until the pressure gauge on the canister reads minus 10 inches of mercury, and the canister valve is closed tightly.
- After sampling is completed at a particular depth interval, the drive-point tip and drive pipe are then driven to the next sampling depth and the process repeated.
- Field equipment used during the process is removed from the borehole and decontaminated by wiping the equipment with paper wipes moistened with DI water.
- Decontaminated sampling equipment is then transported to the next sampling location.

Duplicate VOC/methane samples were required from all sampling depths at Locations DP5 and DP6 in the MWL (Figure 4-1). These duplicate samples were collected from the same depth interval as the primary samples by filling a second SUMMA™ canister immediately after the primary sample had been collected.

4.5.2 VOC/Methane Sample Analysis

The filled SUMMA™ canisters were shipped to the analytical laboratory (TestAmerica in Santa Ana, California) with an AR/COC form containing the sample ID, sampling location, date and time, depth, and ambient pressure. The SUMMA™ canisters required no special preservation during transport and storage. The soil-vapor samples were analyzed for VOCs plus methane by EPA Method TO-14A (EPA January 1999). All analytical data provided by the laboratory were reviewed and validated according to “Data Validation Procedure for Chemical and Radiochemical Data,” AOP 00-03, Rev. 02 (SNL/NM July 2007).

4.6 Field Screening for VOCs and Radiation

A PID was also used during drilling activities to monitor VOC concentrations in the breathing zone (5 feet above ground). No evidence of a release of VOCs to the surface as a result of the drilling and sampling activities was detected with the PID during the project.

Because of the potential to drill into buried radioactive waste at the MWL, a radiological control technician (RCT) was present at all times during intrusive activities at the site. The RCT performed continuous radiological screening of equipment used for subsurface sampling and of soil samples collected from the boreholes. Equipment and soil samples were characterized by the RCT using real-time field instruments to survey sampling equipment and samples as soon as they were extracted from the subsurface.

In addition, radiological screening was conducted using 2-inch-diameter paper disks that were swiped on the outside surfaces of all reusable sampling equipment and soil-filled sampling sleeves as they were removed from boreholes. The swipe samples were analyzed via gamma spectroscopy and liquid scintillation methods by an on-site SNL/NM radiological laboratory. The samples were temporarily stored in a secure storage building at the site pending the results of the radiological swipe surveys. After Radiation Protection and Sample Management Office personnel determined the screening results acceptable, the samples were shipped to the off-site contract laboratory.

No evidence of radiological contamination was found on sampling equipment or samples during this project. At the conclusion of the project, the Geoprobe® rig and associated equipment were screened for radiological contamination. All equipment was cleared for release from the site by the RCT and allowed to leave the radiological-controlled area.

4.7 Waste Generation and Management

As specified by the requirements of the site-specific waste management plan, waste soil was transferred from the BA sleeves into a 5-gallon, plastic bucket at the sampling location and then into a 55-gallon, metal, waste soil storage drum at the site. The partially filled waste soil drum was removed from the MWL at the conclusion of the project activities and the soil was characterized, managed, and disposed of in accordance with established SNL/NM waste disposal policies and procedures.

Other types of waste that were generated (including PPE, empty BA sleeves, paper wipes used for equipment decontamination, plastic sheeting, etc.) were also containerized in steel drums and later removed from the site. The analytical results for the waste characterization soil samples were also used to characterize the associated PPE and debris.

5.0 2008 FIELD INVESTIGATION RESULTS

Investigation results for the 2008 radon, tritium, and VOC soil-vapor sampling are presented in this chapter. The analytical results for both the 2008 field investigation work and the 1997 radon samples, 1995 tritium soil samples, and 1994 VOC soil-vapor samples are also presented in figures and tables in this chapter, in order to avoid unnecessary duplication in different sections of this report. The old and new data are compared and discussed in Chapter 6.0.

5.1 2008 Radon Sampling Results

Figure 5-1 shows the 1997 and 2008 radon sampling locations and the analytical results for the samples collected at those locations. Table 5-1 also presents the analytical results for the 1997 and 2008 radon samples.

5.1.1 2008 Radon Samples

As described in Chapter 4.0, nine primary and four duplicate radon samples were collected in 2008 at nine measurement locations (RN1 through RN9) in the MWL. Duplicate canisters were placed adjacent to, and within, approximately 1 foot of one another at each of three MWL locations (RN1, RN3, and RN8) (Table 5-1) . Three background measurements were also determined at three locations (RN10 through RN12) southeast, northeast, and northwest of the MWL (Figure 5-1).

The observed radon concentrations range from 0.21 to 0.51 pCi/m^{2}s in the MWL and 0.56 to 0.65 pCi/m^{2}s at the background locations. The average value for the 13 primary and duplicate MWL samples is 0.33 pCi/m^{2}s, which is less than the mean of 0.60 pCi/m^{2}s for the three background measurements. Therefore, the average radon concentration at the nine MWL locations is approximately one-half of the average concentration at the three background locations.

5.1.2 Radon Quality Assurance and Primary/Duplicate Sample Comparison

One TB was included with the radon samples and was counted with the canisters. The measured radon concentration of the TB, which is –0.03 pCi/m^{2}s, is near the expected 0.00 pCi/m^{2}s value. The TB result indicates that the canisters had not been exposed to radon, confirming that the integrity of the bags that contained the canisters had not been compromised.

As shown in Table 5-1, one primary and one duplicate radon canister were placed at each of two locations (RN1 and RN8), and one primary and two duplicate canisters were placed at Location RN3 at the MWL. The radon sample analytical results for the primary and duplicate canisters at Location RN1 are 0.35 and 0.36 pCi/m^{2}s, respectively. The results for the primary and two duplicate canisters at Location RN3 are 0.21, 0.30, and 0.25 pCi/m^{2}s, respectively. Radon sampling results for the primary and duplicate canisters placed at Location RN8 are both 0.28 pCi/m^{2}s.

The summary report provided by the radon canister supplier (ERG) for the 2008 MWL radon flux study is provided in Appendix B (ERG April 2008).

5.2 2008 Tritium Sampling Results and Risk Assessment

Figure 5-2 shows the locations and tritium results for the 1995 and 2008 sampling events at the 10-, 30- and 50-foot depth intervals. Table 5-2 also presents the 1995 and 2008 tritium concentration data, sorted by sampling depth.

5.2.1 Tritium Sample Analyses

Tritium concentrations in the 2008 samples range from 165 to 3.95E+07 pCi/L (both estimated concentrations) in the six MWL borehole locations (DP1 through DP6), and from ND to 260 pCi/L (estimated concentration) in the two background borehole locations (DP7 and DP8). The highest MWL tritium concentration was detected in the primary sample from DP5 at the 10-foot depth interval. However, as shown in Table 5-2, the duplicate sample from this same location and depth interval contained 1.57E+07 pCi/L of tritium, which is less than one-half of that found in the primary sample.

Tritium concentration ranges and means for the 2008 samples at the three sampling depths in both MWL and background boreholes are summarized in Table 5-3. The highest mean and maximum concentrations were found in the 10-foot samples, and the maximum concentrations and means for the 30- and 50-foot samples show a decreasing trend with depth.

5.2.2 Tritium Primary and Duplicate Sample Comparison and Data Validation

As specified in the NMED Notice of Approval Letter for the SV SAP (NMED February 2008), duplicate tritium samples were also collected from the 10-, 30-, and 50-foot intervals at DP5 and from the 10- and 30-foot intervals at DP6. Relative percent differences (RPDs) were calculated for tritium concentrations detected in the primary and duplicate sample pairs and are presented in Table 5-4. Tritium concentration RPD values for the primary and duplicate sample pairs range from 10.98 to 86.23. No quality control acceptance criteria for the evaluation of field duplicates are currently in place.

All laboratory tritium data were also reviewed and verified/validated according to “Procedure for Electronic Data Deliverable (EDD) Processing, SMO-05-04, Issue 01, April 2007” (SNL/NM April 2007a); “Procedure for Completing the Contract Verification Review (CVR), SMO-05-03, Issue 03, April 2007” (SNL/NM April 2007b); and “Data Validation Procedure for Chemical and Radiochemical Data,” AOP 00-03, Rev. 02 (SNL/NM July 2007). Appendix C contains the data validation reports for the 2008 tritium soil samples collected at this site. The data verification and validation review indicated that the tritium sample analytical results are acceptable for MWL site characterization purposes.

5.2.3 Tritium Equipment Blank Sample Results

A total of 13 aqueous tritium EB samples were collected during tritium soil sampling activities at the site. The analytical results for the EB samples are presented in Table 5-2. Tritium was not detected in any of the EBs, which indicates that the equipment decontamination procedures used during collection of the tritium soil samples were acceptable. This demonstrates that transfer and cross-contamination of tritium between sampling locations from reusable sampling equipment did not occur.

5.2.4 2008 Tritium Risk Assessment

The maximum detected tritium activity in soil for the MWL April–May 2008 sampling event is 3.95E+07 pCi/L in the sample from DP5 at the 10-foot depth interval. For purposes of this risk assessment, a very conservative assumption was made that this tritium concentration is present on the surface of the MWL (rather then at 10 feet below the original MWL grade or 11.5 feet below the current surface where it was actually detected) and that direct contact with receptors is possible. The shielding effect of 11.5 feet of soil was not considered in the calculation.

This sample contained a gravimetric soil-moisture content of 3.56 percent, which converts to a tritium activity of approximately 1.41E+03 picocuries per gram (pCi/g). Based upon this activity, a corresponding dose was calculated using the RESRAD [residual radiation] computer program (Argonne National Laboratory July 2001) and the same methodology followed by the ER Project. These doses are summarized as follows for both the residential and industrial land-use scenarios.

The incremental total effective dose equivalent (TEDE) for the residential land-use scenario is 4.5E-01 millirem per year (mrem/yr). For comparison, the guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998) for a complete loss of institutional controls (residential land use in this case). Therefore, the calculated dose value for the residential land-use scenario is approximately two orders of magnitude below this guideline, even with the extremely conservative assumption that surface contact is possible. The estimated excess cancer risk is 7.1E-07.

For the industrial land-use scenario, a TEDE was calculated that resulted in an incremental TEDE of 6.7E-04 mrem/yr. In accordance with EPA guidance found in Office of Solid Waste and Emergency Response Directive No. 9200.4-18 (EPA 1997), an incremental TEDE guideline of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for the industrial land-use scenario is approximately four orders of magnitude below this guideline as well. The estimated excess cancer risk is 6.5E-09.

Surface tritium soil samples have been collected on an annual basis at the northeast, northwest, southwest, and southeast corners of the MWL since 1985. These MWL samples are collected as part of the SNL/NM Terrestrial Surveillance Monitoring Program and the results are reported on an annual basis in the “Annual Site Environmental Report for Sandia National Laboratories, New Mexico” (SNL/NM September 2007b). The latest samples were collected from the northeast, northwest, southwest, and southeast MWL corners on June 5, 2007, and contained tritium concentrations of 309, 218, 223, and 182 pCi/L, respectively. These concentrations are less than the SNL/NM background concentration of 420 pCi/L for tritium in soil (Tharp February 1999). These data demonstrate that concentrations of tritium being released from surface soil at the MWL are below background levels and that these releases pose no threat to human

health or the environment. These concentrations are also far below the trigger of 2.00E+04 pCi/L for tritium in surface soil presented in the "Long-Term Monitoring and Maintenance Plan [LTMMP] for the Mixed Waste Landfill, Sandia National Laboratories/New Mexico, Environmental Restoration Project" (SNL/NM September 2007a).

5.3 2008 VOC/Methane Soil-Vapor Sampling Results

The 2008 VOC sampling locations are shown in Figure 4-1. For ease of comparability, analytical results for dichlorodifluoromethane (CFC-12), tetrachloroethene (PCE), trichloroethene (TCE), and total VOCs in both the 1994 and 2008 soil-vapor samples are presented (the comparison is discussed in Chapter 6.0). Figures 5-3, 5-4, 5-5, and 5-6 show the locations and concentrations of the 1994 and 2008 sampling locations at the 10-, 30- and 50-foot depth intervals for CFC-12, PCE, TCE, and total VOCs, respectively. Tables 5-5 and 5-6 include CFC-12, PCE, TCE, and total VOC results for 1994 and 2008 samples at the 10- and 30-foot sampling depths. Table 5-7 presents 2008 results for the three constituents and total VOCs for the 50-foot depth only, as no 50-foot depth soil-vapor samples were collected in 1994. Finally, Table 5-8 presents methane-only results for the 2008 soil-vapor samples, as methane was required as an additional analyte by the NMED (NMED February 2008). Table 5-9 provides the method detection limits (MDLs) for the soil-vapor samples.

5.3.1 VOC/Methane Sample Analyses

The number of individual VOCs detected in each of the 2008 soil-vapor samples was variable, up to a maximum of 50 compounds. Most of the compounds were detected at very low concentrations (less than 10 ppbv). The analytical data reports that present all VOCs detected in the 2008 samples are provided in Appendix D.

The range of concentrations for CFC-12, PCE, TCE, total VOCs, and methane detected in the 2008 samples from the six MWL locations (DP1 through DP6) and two background locations (DP7 and DP8), as well as the locations at which the highest concentrations were found, are summarized in Table 5-10. In general, the highest total VOC concentrations at the six MWL borehole locations were detected in the 30-foot samples, and the lowest levels were detected in the 50-foot samples, although the highest total VOC concentration (1.33E+03 ppbv) was also found in a 50-foot MWL sample. The highest methane concentration (5.40E+06 ppbv) was also detected in a 50-foot sample.

5.3.2 VOC/Methane Primary and Duplicate Sample Comparison and Data Validation

As specified in the NMED Notice of Approval Letter for the SV SAP (NMED February 2008), duplicate VOC and methane samples were collected from the 10-, 30-, and 50-foot intervals in DP5 and in the 10- and 30-foot intervals in DP6. RPDs were calculated for CFC-12, PCE, TCE, total VOCs, and methane concentrations detected in the primary and duplicate sample pairs and are presented in Table 5-11. As shown in Table 5-11, RPD values for the three individual VOCs, total VOCs, and methane concentrations in the primary and duplicate sample pairs range from 0.0 to 197.49. No quality control acceptance criteria for the evaluation of field duplicates are currently in place.

All laboratory VOC data were also reviewed and verified/validated according to “Procedure for Electronic Data Deliverable (EDD) Processing, SMO-05-04, Issue 01, April 2007” (SNL/NM April 2007a); “Procedure for Completing the Contract Verification Review (CVR), SMO-05-03, Issue 03, April 2007” (SNL/NM April 2007b); and “Data Validation Procedure for Chemical and Radiochemical Data,” AOP 00-03, Rev. 02 (SNL/NM July 2007). Appendix E contains the data validation reports for the VOC samples collected at this site. The data verification and validation review indicated that the VOC sample analytical results are acceptable for MWL site characterization purposes.

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6.0 SUMMARY OF RESULTS AND COMPARISON OF INVESTIGATIONS

This chapter summarizes and compares the results of the 1994 Soil-Vapor VOC, 1995 tritium, and 1997 radon investigations with the radon, tritium, and VOC investigations completed at the MWL in 2008, which are presented in Chapter 5.0. Applicable or relevant action levels are also discussed.

6.1 1997 and 2008 Radon Sample Comparison

The analytical results for the radon sampling conducted in 1997 and 2008 are presented in Figure 5-1 and Table 5-1 in Chapter 5.0. As shown in Figure 5-1, radon samples were collected from a total of 101 locations in and around the MWL in 1997 and 2008. Radon samples were collected from 21 locations around the perimeter of the MWL (18 in 1997 and 3 in 2008) and from 80 locations in the landfill (71 in 1997 and 9 in 2008).

The 1997 and 2008 MWL perimeter/background radon values and MWL radon values are plotted separately in Figure 6-1. The Figure 6-1 log-probability plot and other similar figures presented in this chapter were generated using Minitab 15^{TM} statistical plotting software. The figure contains pertinent summary statistics (N, mean, standard deviation, and minimum/median/maximum) for the data sets. For ease of viewing, the data were plotted on a log-probability scale. This allows the reader to see the range and variability of all the data at a glance. In order to construct the plot, all data were sorted from the lowest to the highest radon concentration, without respect to location. These log-probability plots are constructed such that one-half of the data points plot to the left, and one-half of the data points plot to the right, of the 50-percent value on the X-axis.

As shown in Figure 6-1, there is little difference between the mean, median, and minimum and maximum radon values for the 1997 and 2008 MWL radon data sets. The mean and maximum radon values at the MWL in 1997 were 0.35 and 1.00 pCi/m^{2}s, respectively, and 0.33 and 0.51 pCi/m^{2}s, respectively, for the 2008 samples.

The mean and maximum radon values for the 1997 perimeter (background) locations were 0.39 and 0.66 pCi/m^{2}s, respectively, and 0.60 and 0.65 pCi/m^{2}s for the 2008 background locations. The background mean for the 1997 samples is slightly lower than that for the 2008 background samples, and the maximum radon values are essentially the same. The 1997 background radon samples were collected within approximately 50 feet of the MWL, and the 2008 background radon samples were collected at three locations approximately 300 to 400 feet away from the MWL (Figure 5-1). These data indicate that the radon emissions from the naturally occurring sediments surrounding the MWL are essentially the same as those from the MWL itself. The two data sets also show that radon emissions from the MWL and background areas have not changed from 1997 to 2008. In addition, radon levels in both the 1997 and 2008 samples are one order of magnitude below the EPA 40 CFR 192 standard and the MWL cover design standard of 20 pCi/m^{2}s presented in the LTMMP for the MWL (SNL/NM September 2007a).

6.2 1995 and 2008 Tritium Sample Comparison

In Chapter 5.0, data and locations of the 1995 and 2008 tritium samples and the tritium concentrations that were detected at the 10-, 30-, and 50-foot depths in both 1995 and 2008 are presented in Table 5-2 and Figure 5-2. The 1995 tritium sampling results were originally reported in units of pCi/L by the analytical laboratory that performed the analyses. The results were then converted to pCi/g and presented in Table 4.6-8 of the "Report of the Mixed Waste Landfill Phase 2 RCRA Facility Investigation, Sandia National Laboratories, Albuquerque, New Mexico," SAND Report SAND2002-2997 (SNL/NM September 2002). The tritium analytical results for the 1995 samples that are presented in Table 5-2 and Figure 5-2 were obtained directly from the analytical laboratory certificate of analyses reports and are again expressed in the original units (pCi/L) reported by the laboratory.

Because none of the 2008 tritium samples were collected from the same locations that were sampled in 1995, a direct comparison of 1995 and 2008 tritium concentrations was not possible. The 2008 and 1995 boreholes and locations in closest proximity to each other are DP6, which is located approximately 35 feet northeast of Borehole BH-5 and approximately 45 feet southwest of borehole BH-6. All three of these locations are near the northwest corner of the landfill (Figure 5-2). As shown in Table 6-1, tritium concentrations in the 10-foot samples from these three borehole locations are similar, while the 30-foot samples exhibit greater variability. Tritium concentrations for the 50-foot samples from BH-5 and BH-6 are also similar (50-foot samples were not collected at the 2008 DP6 location).

The 2008 DP3 location is the next-closest sampling location to 1995 boreholes. DP3 is located approximately 50 feet west and 50 feet east of 1995 Boreholes BH-11 and BH-12, respectively. All three of these locations are near the southern end of the classified area (Figure 5-2). Tritium concentrations in the 10-, 30-, and 50-foot samples from these three borehole locations exhibit substantial variability, as shown in Table 6-2. The highest tritium concentration at these three locations was detected in the 30-foot sample from BH-12.

In addition, the two highest tritium concentrations in the 2008 samples (3.95E+07 J and 1.57E+07 J pCi/L) were detected in the primary and duplicate sample pair from the 10-foot depth interval at DP5. This primary/duplicate sample pair indicates that the tritium concentrations can vary significantly in individual samples that are collected at the same depths and in close proximity to each other (less than 5 feet apart in this case).

Figure 6-2 was presented in the 2002 MWL SAND report (SNL/NM September 2002) and is a plan view that shows the results of tritium surface sampling that was conducted at the landfill in 1993. The contours shown in this figure are based upon a total of 92 surface soil samples that were collected from the surface of the MWL and northwest of the landfill. This figure demonstrates that the highest surface tritium concentrations were found in the northern portion of the MWL in 1993.

Figures 6-3, 6-4, and 6-5 present tritium concentration isopleths in plan view for the 2008 MWL samples at the 10-, 30-, and 50-foot depth intervals, respectively. The isopleth contouring pattern shown in these figures is based upon six sampling locations for each of the 10- and 30-foot depth intervals and only three locations for the 50-foot depth. In spite of this limitation, these figures demonstrate that the tritium concentration isopleths decrease with depth and that the maximum tritium concentrations are centered on DP5 in the northwest area of the landfill.

Figure 6-6 is a plot that shows the tritium concentrations for both 1995 and 2008 samples at the 10-, 30-, and 50-foot depths. The "N*" in the statistical text box of this figure denotes the number of tritium ND results in the 1995 data set. Tritium ND results are defined as laboratory-reported values that are either negative numbers or values less than the analytical error (Table 5-2). As shown in Figure 5-2, 1995 tritium samples were collected from 15 boreholes that were located around the perimeter of the MWL, and none of the 1995 samples were collected in the MWL. In 2008, tritium samples were collected from six borehole locations in the landfill, and from two background locations southwest of the MWL. The 2008 borehole location DP5, where the highest tritium concentrations were found, is located between, and close to, the edges of two waste disposal trenches in the northwestern portion of the MWL. The overall higher tritium concentrations detected in the 2008 samples were expected because most of these samples were collected in close proximity to waste pits and trenches in the landfill.

6.3 1994 and 2008 Soil-Vapor VOC Comparison

Figures and tables showing sampling locations and analytical results for CFC-12, PCE, TCE, total VOCs, and methane are presented in Chapter 5.0. The three VOC constituents that were detected at the highest concentrations in the 1994 soil-vapor samples included CFC-12, PCE, and TCE. Total VOCs in soil-vapor were also reported for the 1994 samples (SNL/NM September 1996). Therefore, these same three constituents and total VOCs in the 2008 samples were also selected for comparison with the 1994 data.

The analytical results for 98 individual VOCs plus methane were reported by the laboratory for the 2008 samples. As described in Section 5.3.1, up to 50 individual VOCs were detected in the 2008 soil-vapor samples but most were detected at very low concentrations (less than 10 ppbv), whereas up to eight individual VOCs were detected and reported for the 1994 active soil-vapor samples. The MDLs for the 1994 samples range from 10 to 1,000 ppbv. Laboratory analytical methodology and instrumentation have improved considerably since 1994, and much lower levels of analytical sensitivity are now possible. As a result, MDLs for the 2008 samples range from 0.5 to 25 ppbv, with all but 12 of those compounds having MDLs of less than 5 ppbv, and only one (benzyl chloride) having an MDL greater than 10 ppbv (Table 5-9). Improvements in laboratory analytical instrumentation are therefore the reason why more individual VOCs were detected in the 2008 samples, compared with the 1994 samples.

As shown in Table 5-8, methane concentrations range from ND to 4.30E+03 J ppbv in the 2008 MWL soil-vapor samples collected at 10 feet; ND to 2.20E+05 ppbv in the 30-foot MWL samples; and from ND to 5.40E+06 ppbv in the 50-foot MWL samples. Methane was not reported, nor was it an analyte for the 1994 soil-vapor samples. Very little to no methane was detected in the 10-foot samples, and somewhat elevated methane levels were detected only in the 30- and 50-foot samples from DP3.

As shown in Table 6-3, the mean, median, and maximum values for CFC-12, PCE, TCE, and total VOCs have all decreased markedly from 1994 to 2008. Vadose zone triggers for PCE, TCE, and total VOCs detected in MWL soil-vapor samples are presented in the LTMMP for the MWL (SNL/NM September 2007a). Trigger levels are 2.00E+04 ppbv for PCE and TCE, and 2.50E+04 ppbv for total VOCs. The maximum concentrations of PCE and TCE in the 1994 samples were less than the respective LTMMP triggers (SNL/NM September 2007a), and total VOCs exceeded the trigger. In 2008, the maximum concentrations of PCE, TCE, and total VOCs are all much lower than the respective triggers.

Figures 6-7 through 6-10 show concentrations in active soil-vapor samples for CFC-12, PCE, TCE, and total VOC samples, respectively, collected at the 10- and 30-foot depths (1994 and 2008 samples) and at 50 feet (2008 samples only). For plotting purposes, ND results were converted to values that are one-half of the MDL. It is apparent from these four figures that overall concentrations of CFC-12, PCE, TCE, and total VOCs have declined at the MWL since 1994.

6.4 Overall Comparison

A comparison of the mid-1990s and 2008 radon, tritium, and VOC sample data showed that:

- Radon emissions from the MWL were at background levels in the 1997 and 2008 samples and have not changed over time.
- Tritium concentrations in the 2008 soil samples are in general higher than those in the 1995 samples because most of the 2008 samples were collected in the landfill, while the 1995 samples were collected from around the MWL perimeter.
- CFC-12, PCE, TCE, and total VOC concentrations in the 2008 soil-vapor samples are lower than those in the 1994 samples.

The results of this investigation are consistent with the MWL conceptual model and support the recommendations described in the MWL LTMMP (SNL/NM September 2007a) to complete the vegetative soil cover with a biointrusion barrier and continue long-term air, biota, surface soil, vadose zone, and groundwater monitoring to ensure that the final remedy for the MWL is protective of human health and the environment. The half-life of tritium is 12.6 years, and tritium concentrations will continue to decrease over time. If the current trend continues, VOC concentrations would also be expected to continue to decline over time. Completing the cover will also further reduce the potential for infiltration of precipitation into the subsurface of the landfill.

7.0 RECOMMENDATIONS

This chapter presents recommendations for future activities at the MWL based upon the 2008 radon, tritium, and VOC sampling results.

7.1 Radon Monitoring

Radon sampling on the surface of the MWL, completed in both 1997 and 2008, shows that background levels of radon are being released from the landfill. The mean and maximum radon concentrations at the nine 2008 MWL radon sampling locations are also lower than concentrations detected at the three 2008 background locations.

Continued monitoring for radon is recommended in the LTMMP for the MWL (SNL/NM September 2007a). The proposed radon monitoring will be conducted on a quarterly basis in Years 1 and 2 following cover completion to establish initial concentration data, then on a semiannual basis for Years 3 and 4, and then on an annual basis in Year 5 and subsequent years. Completion of the MWL cover installation, as described in the MWL CMI Plan (SNL/NM November 2005), should further reduce radon emissions from the MWL. It is recommended that radon monitoring at the MWL be conducted as described in the LTMMP.

7.2 Tritium Monitoring

Studies conducted at the MWL in 1992, 1993, and 2003 revealed that the tritium flux from the MWL to the atmosphere is at low levels and does not pose a threat to human health or the environment. These studies indicate that, as expected, tritium released from the landfill to the atmosphere declined significantly from 1993 to 2003 (SNL/NM September 2007a).

The SNL/NM Terrestrial Surveillance Program has monitored concentrations of tritium in surface soil at four corners of the MWL on an annual basis since 1985. These concentrations have been diminishing with time due to natural radioactive decay of tritium, and the tritium concentrations in the latest surface soil samples collected at the site in June 2007 were all below background values (SNL/NM September 2007b). Tritium concentrations at the landfill surface do not pose a threat to human health or the environment.

Continued surface soil sampling at the four corners of the landfill on an annual basis for long-term tritium monitoring is proposed in the MWL LTMMP. Tritium is very mobile and should a significant release from the landfill contents occur, increased tritium would be detected in soil samples during the annual sampling events. A significant release is defined as a release greater than the proposed LTMMP trigger of 2.00E+04 pCi/L of tritium in surface soil (SNL/NM September 2007a). It is therefore recommended that the surface tritium sampling described in the LTMMP be implemented.

7.3 Vadose Zone VOC Monitoring

The 1994 and 2008 soil-vapor VOC data demonstrate that VOC concentrations in soil-vapor at 10 and 30 feet bgs have decreased since 1994. In addition, CFC-12, PCE, TCE, and total VOC concentrations in the 50-foot samples collected in 2008 are less than those in the 30-foot samples, which indicate that soil-vapor VOC concentrations decrease with depth.

Continued monitoring for vadose zone VOCs is recommended in the LTMMP for the MWL (SNL/NM September 2007a). Three soil-vapor monitoring wells will be constructed at the MWL. Soil-vapor sampling ports will be installed at depths of 50, 100, 200, 300, and 400 feet bgs. Soil-vapor VOC data collected from the wells will be used to further assess current VOC distributions with depth and to monitor VOC concentrations over time, allowing early identification of any potential threats to groundwater. The VOC data from the wells will also be included in the MWL fate and transport model updated every five years. It is therefore recommended that vadose zone VOC monitoring plans presented in the LTMMP be implemented.

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FIGURES

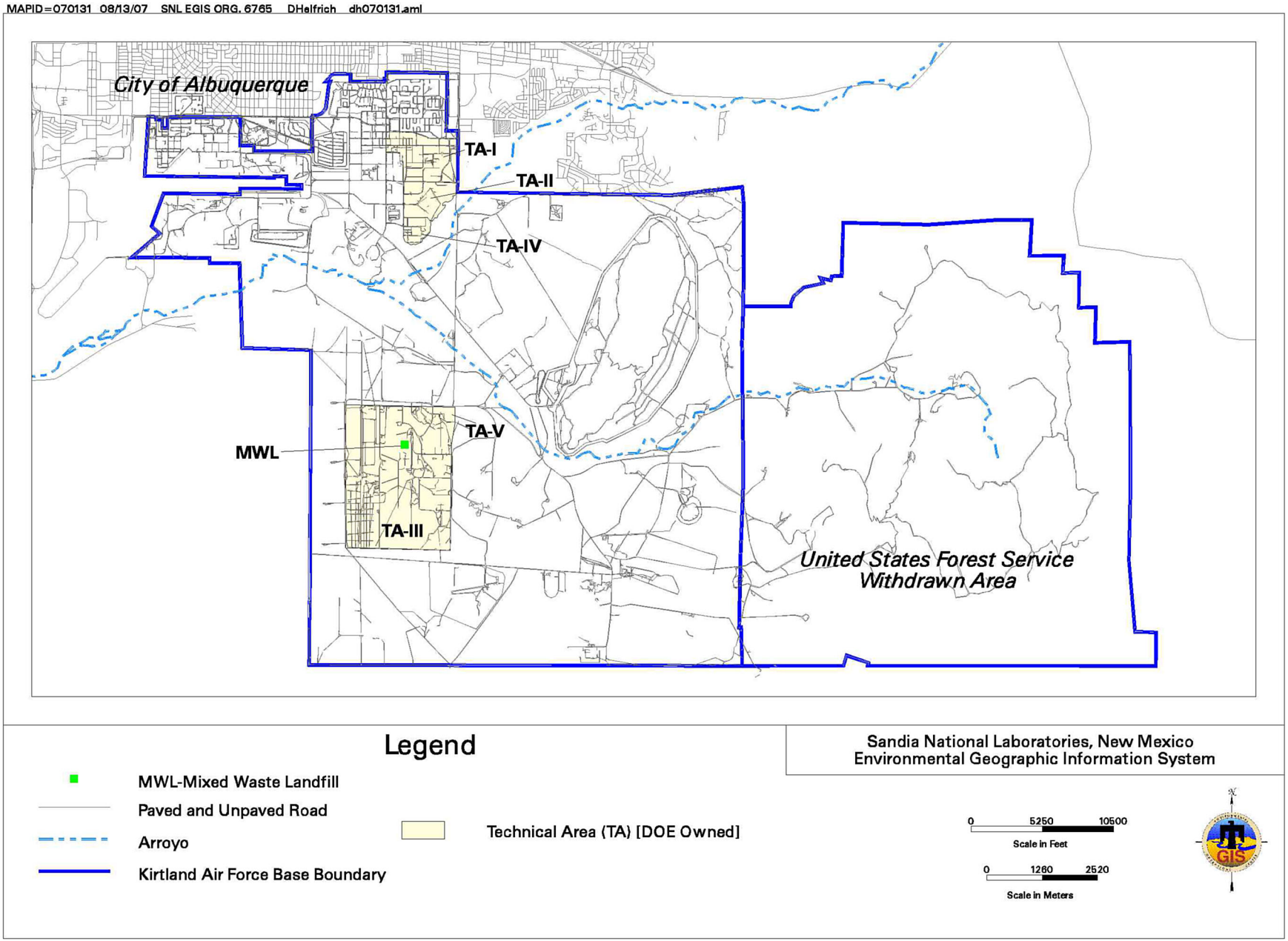

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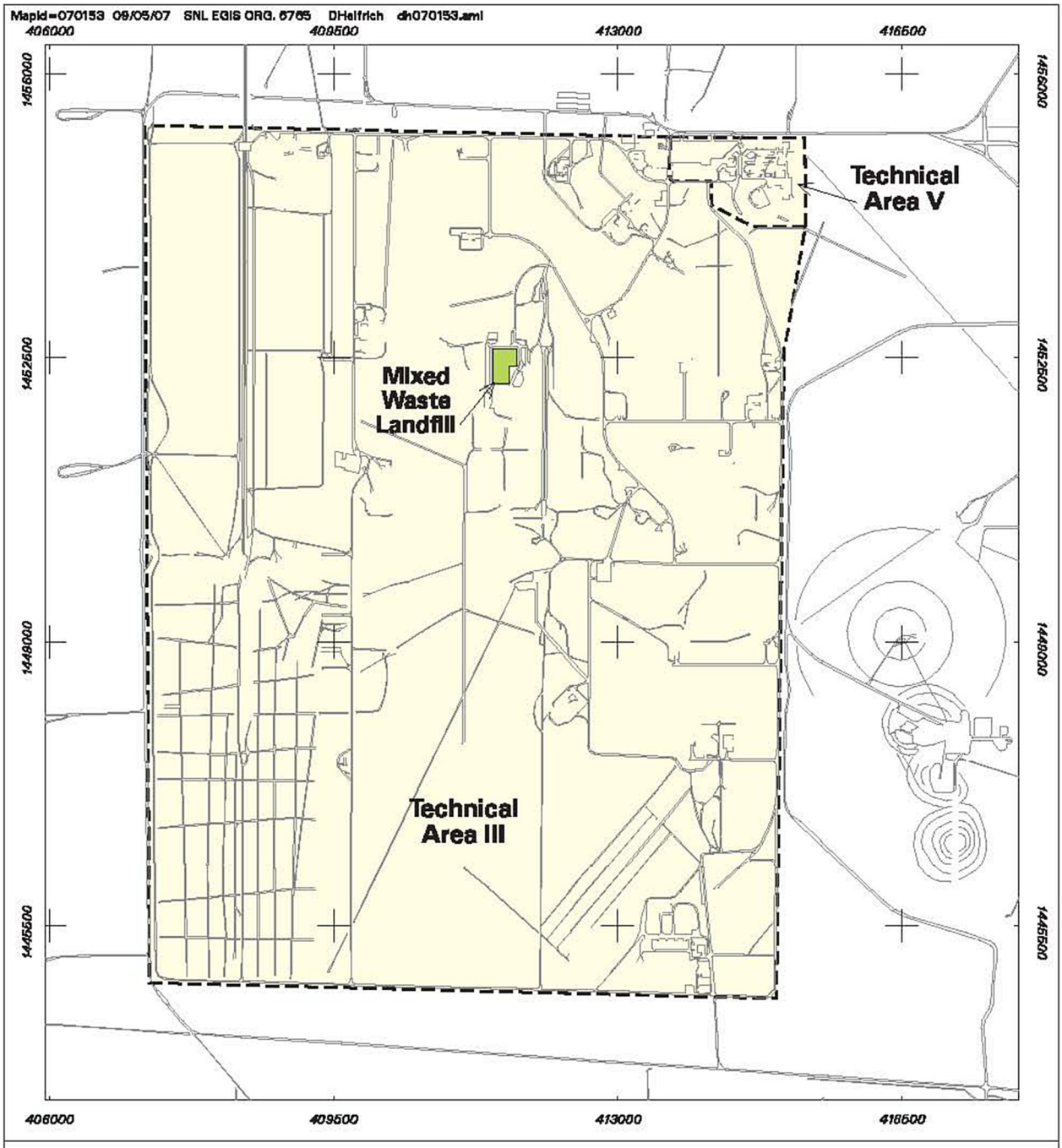
Figure 1-1
Location of Sandia National Laboratories and Kirtland Air Force Base



Legend

Paved and Unpaved Road

Technical Area

Mixed Waste Landfill

Figure 1-2
Location of the Mixed Waste Landfill within Technical Area III

0 1000 2000
Scale in Feet

0 240 480
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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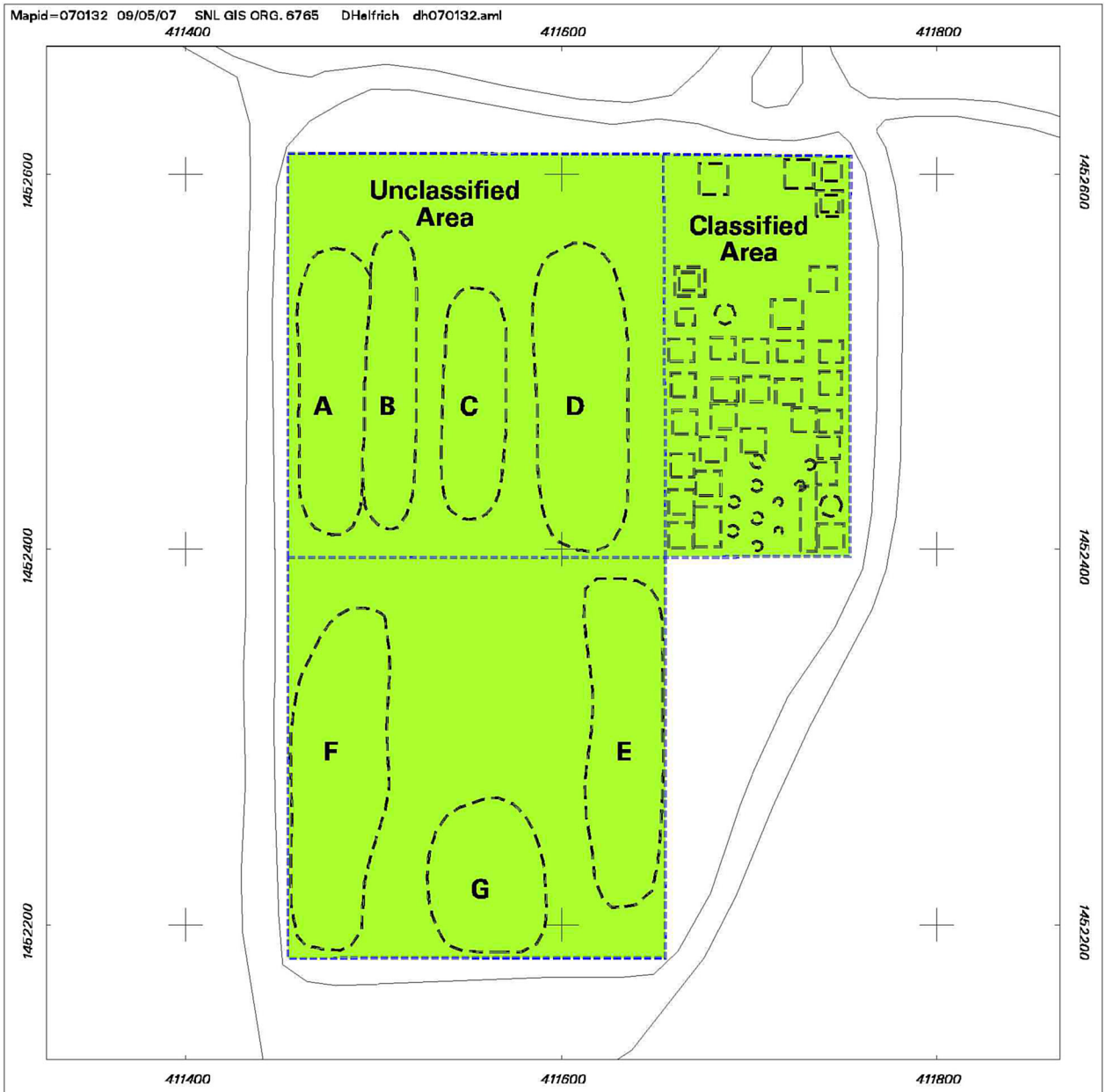

Legend

Former MWL Fence

Pits and Trenches

Former Road

MWL Extent

Figure 1-3
Map of the Mixed Waste Landfill

0 45 90
Scale in Feet

0 10.8 21.6
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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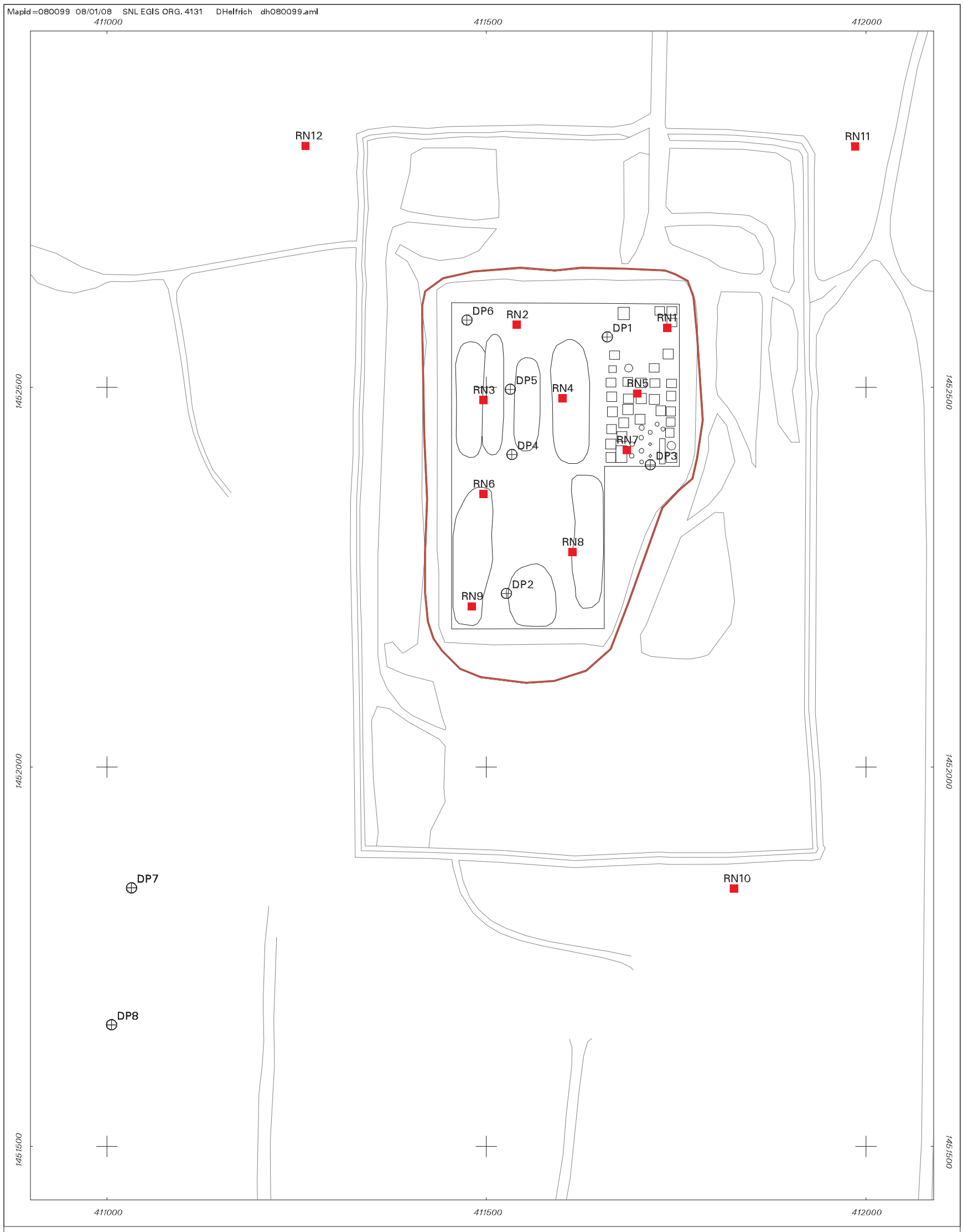


Legend

- 2008 Radon Sampling Location
- 2008 VOC Soil-Vapor and Tritium Soil Sampling Location
- Toe of Landfill Subgrade
- MWL Boundary, Trench & Pit Location
- Edge of unpaved Road

Figure 4-1
2008 Radon, Tritium, and Soil-Vapor VOC Sampling Locations at the Mixed Waste Landfill

0 140 280
Scale in Feet

0 34 68
Scale in Meters

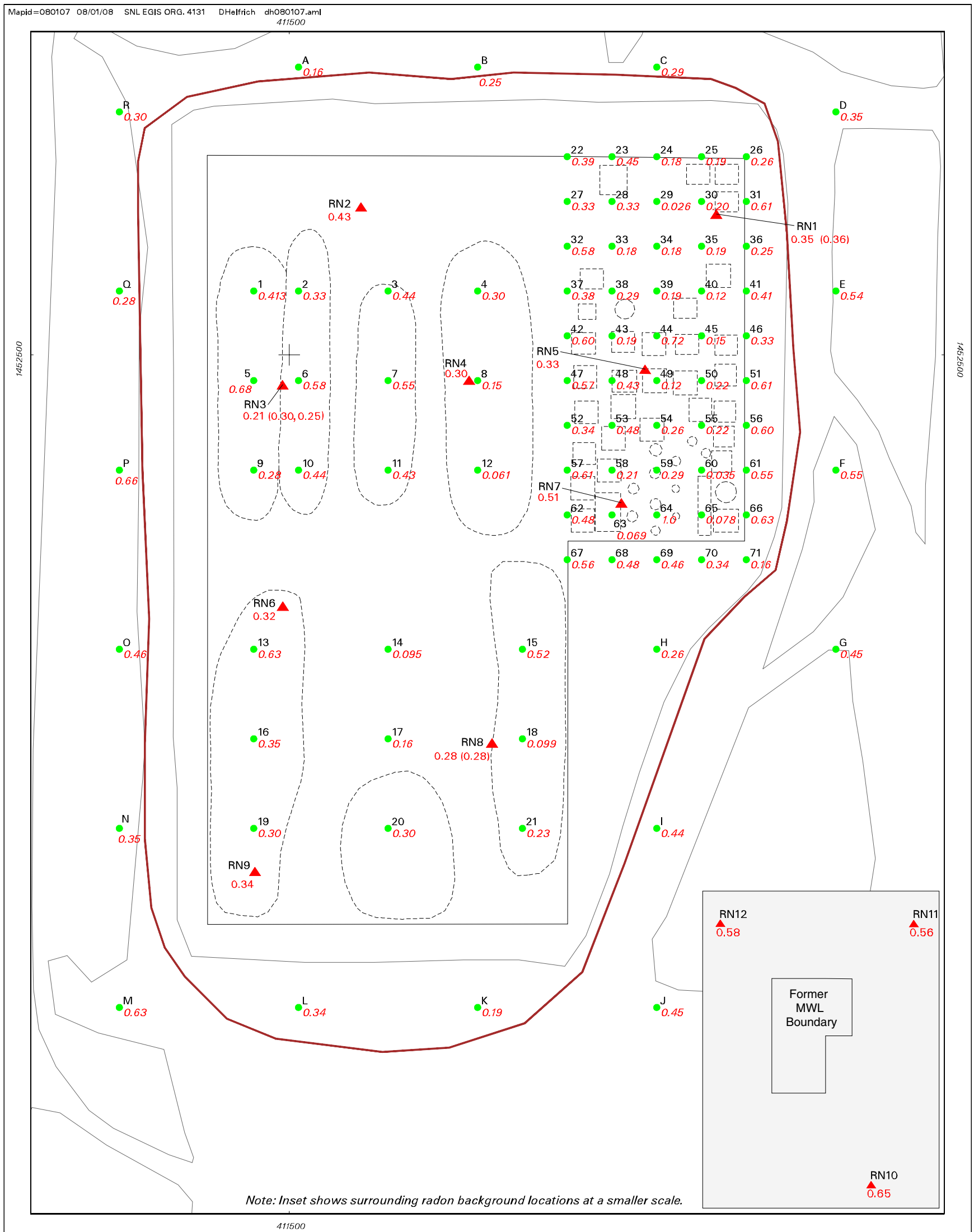
Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.04330000 B6

Figure 4-2
Collecting Tritium Soil Samples with the Geoprobe® at the Mixed Waste Landfill, April 10, 2008 (view to the northeast).

Figure 4-3
Scanning a Soil-Filled Geoprobe® Butyl Acetate Sleeve for Radiological Contamination at the Mixed Waste Landfill, April 11, 2008 (view to the east).

Figure 4-4
Collecting a Soil-Vapor VOC Sample at the
Mixed Waste Landfill, May 14, 2008 (view to the west).



Legend

N 0.35 — 1997 Radon sampling location and result (pCi/m²s)

RN2 0.43 — 2008 Radon sampling location and result (duplicate) (pCi/m²s)

Former MWL Boundary

Toe of Landfill Subgrade

Trench & Pit Location

Edge of unpaved Road / Berm

Figure 5-1
1997 and 2008 Radon Sampling Locations and Sample Results at the Mixed Waste Landfill

0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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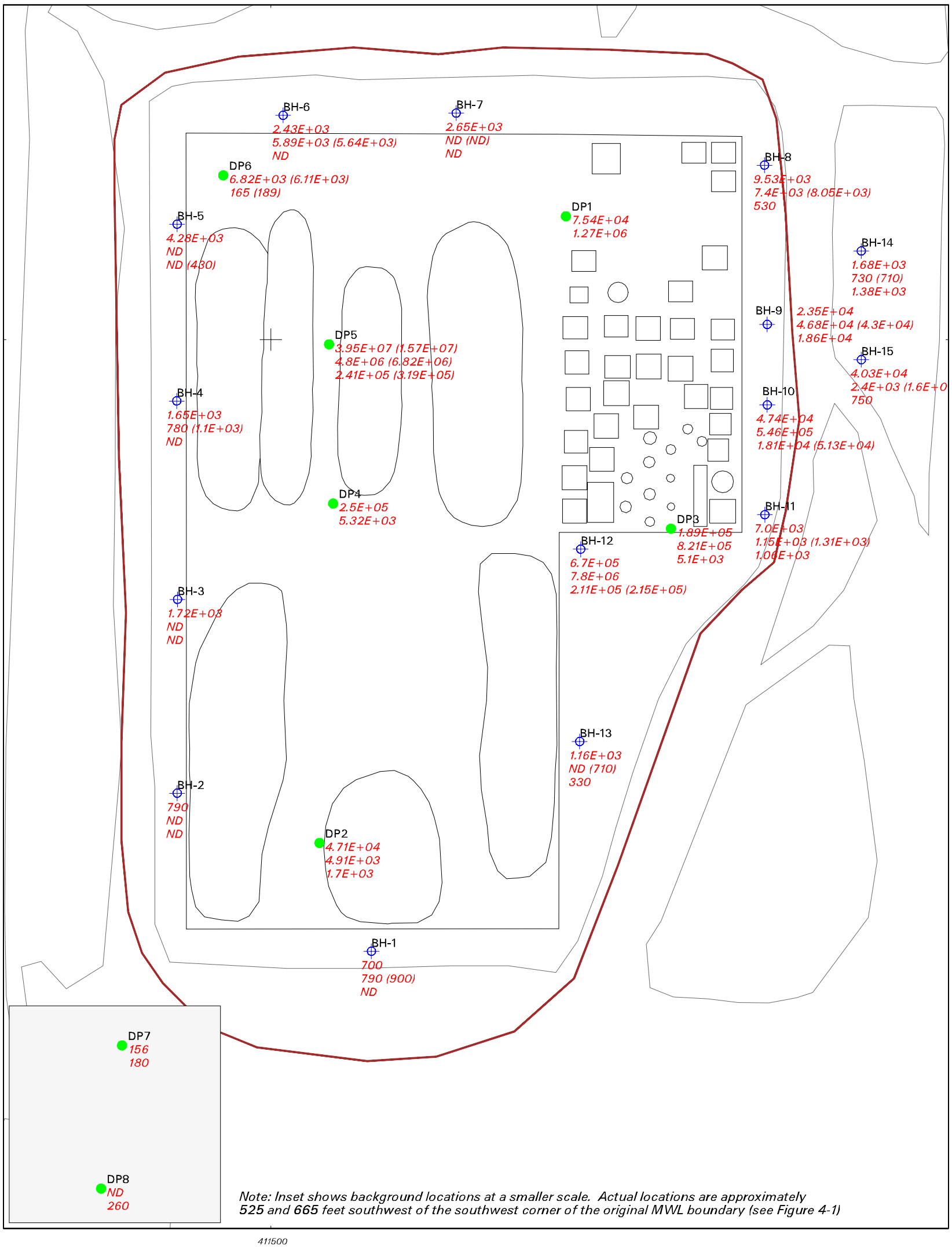

Legend

DP2 — 4.7E+04 — 2008 Tritium sampling location and result (pCi/L) at 10 and 30 ft. (two values), and 10, 30, and 50 ft. (three values) (duplicate)

BH-1 — 700 — 1995 Soil-Vapor and Tritium sampling location and result (pCi/L) at 10, 30, and 50 ft. (duplicate)

Toe of Landfill Subgrade

Trench & Pit location, former MWL Boundary

Edge of unpaved Road

Figure 5-2
1995 and 2008 Tritium Soil Sampling Locations and Sample Results at 10-, 30-, and 50-Foot Depths at the Mixed Waste Landfill

0 60 120
Scale in Feet
0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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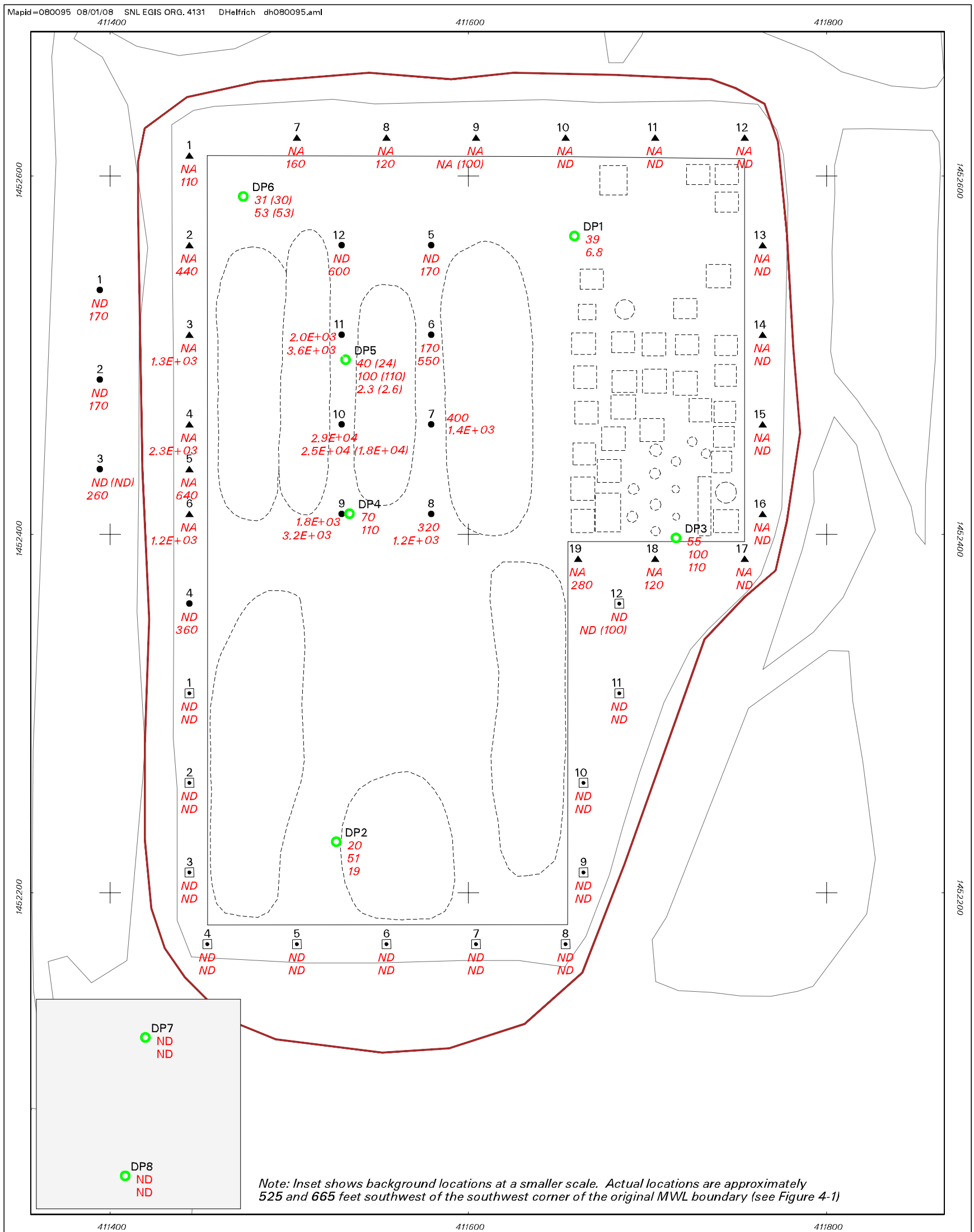

Legend

1 ▲ 110 — 1994 First-round sample location, borehole number, and CFC-12 result (ppbv) at 10 and 30 ft. (duplicate)

6 ● 170 — 1994 Second-round sample location, borehole number, and CFC-12 result (ppbv) at 10 and 30 ft. (duplicate)

5 ▣ ND — 1994 Third-round sample location, borehole number, and CFC-12 result (ppbv) at 10 and 30 ft. (duplicate)

DP2 ○ 20 — 2008 sample location, borehole number, and CFC-12 result (ppbv) at 10 and 30 ft. (two values) and 10, 30 and 50 ft. (three values) (duplicate)

Former MWL Boundary

Toe of Landfill Subgrade

Trench & Pit location

Edge of unpaved Road

Figure 5-3
1994 and 2008 Soil-Vapor Dichlorodifluoromethane (CFC-12) Sampling Locations and Sample Results at 10-, 30-, and 50-Foot Depths at the Mixed Waste Landfill

0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.04330000 B5

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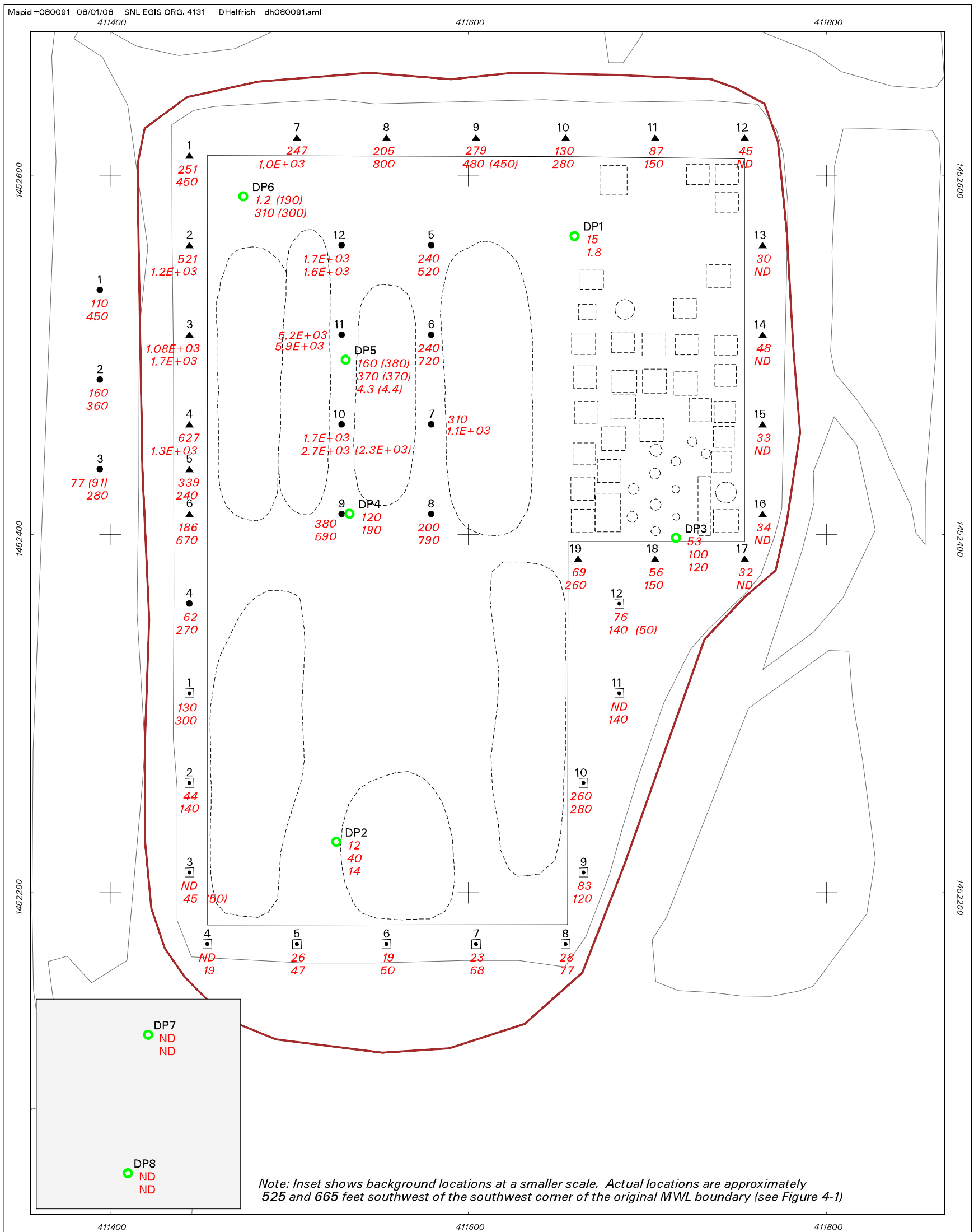

Legend

1994 First-round sample location, borehole number, and PCE result (ppbv) at 10 and 30 ft. (duplicate)

1994 Second-round sample location, borehole number, and PCE result (ppbv) at 10 and 30 ft. (duplicate)

1994 Third-round sample location, borehole number, and PCE result (ppbv) at 10 and 30 ft. (duplicate)

2008 sample location, borehole number, and PCE result (ppbv) at 10 and 30 ft. (two values) and 10, 30, and 50 ft. (three values) (duplicate)

Former MWL Boundary

Toe of Landfill Subgrade

Trench & Pit location

Edge of unpaved Road

Figure 5-4
1994 and 2008 Soil-Vapor Tetrachloroethene (PCE) Sampling Locations and Sample Results at 10-, 30-, and 50-Foot Depths at the Mixed Waste Landfill

0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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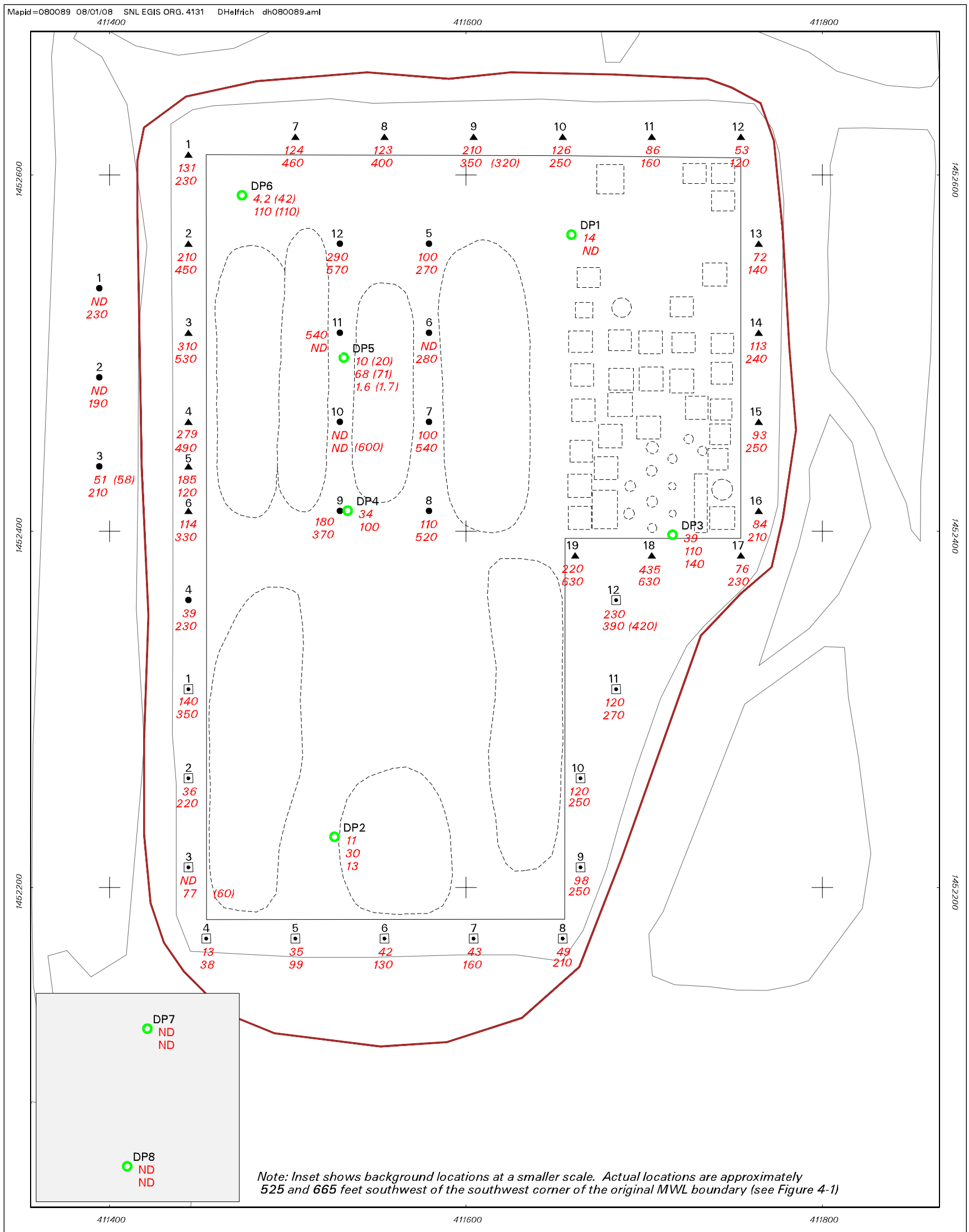

Legend

1994 First-round sample location, borehole number, and TCE result (ppbv) at 10 and 30 ft. (duplicate)

1994 Second-round sample location, borehole number, and TCE result (ppbv) at 10 and 30 ft. (duplicate)

1994 Third-round sample location, borehole number, and TCE result (ppbv) at 10 and 30 ft. (duplicate)

2008 sample location, borehole number, and TCE result (ppbv) at 10 & 30 ft. (two values) and 10, 30, & 50 ft. (three values) (duplicate)

Former MWL Boundary

Toe of Landfill Subgrade

Trench & Pit location

Edge of unpaved Road

Figure 5-5
1994 and 2008 Soil-Vapor Trichloroethene (TCE) Sampling Locations and Sample Results at 10-, 30-, and 50-Foot Depths at the Mixed Waste Landfill

0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

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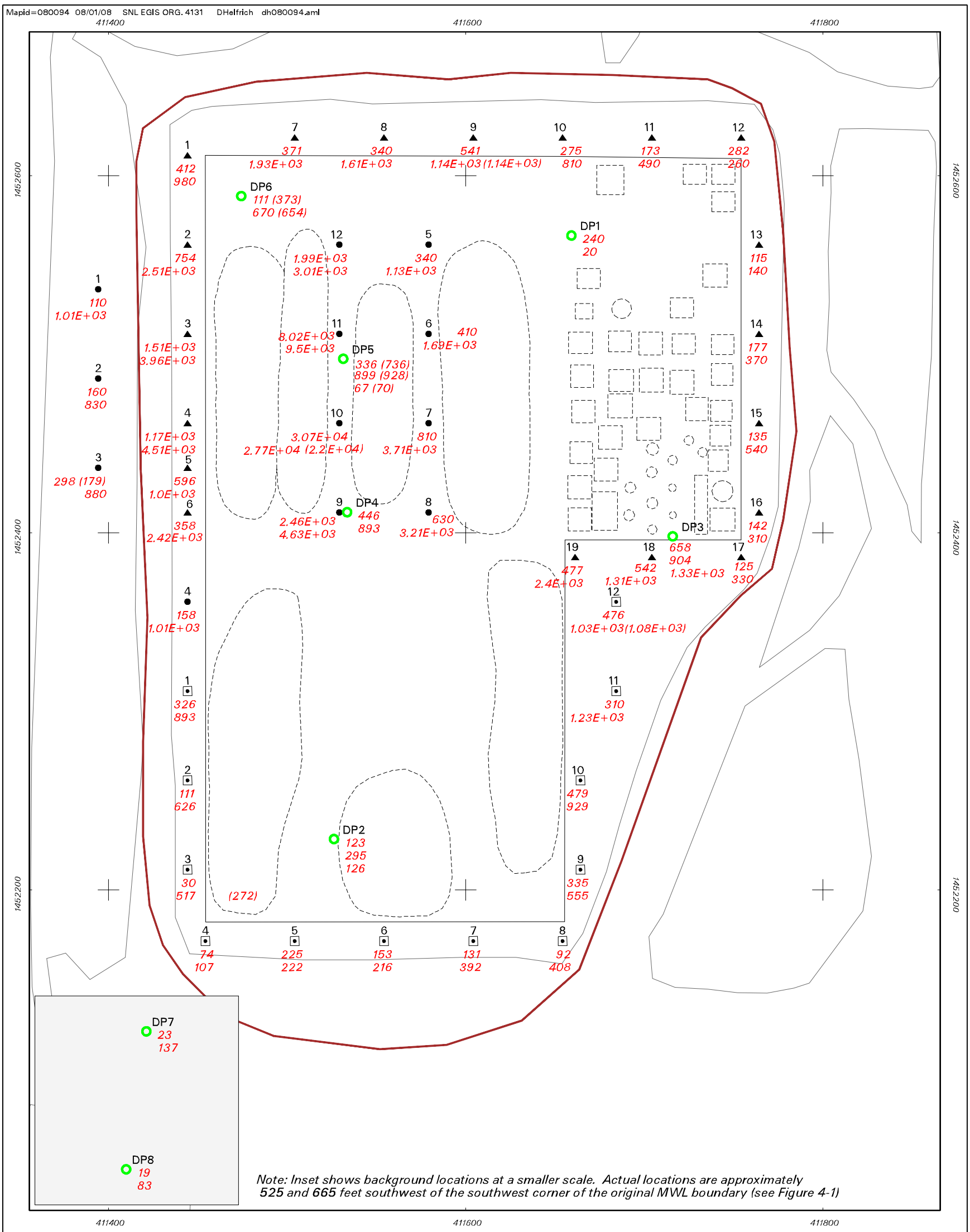


Legend

1994 First-round sample location, borehole number, and total soil-vapor VOC result (ppbv) at 10 and 30 ft. (duplicate)

1994 Second-round sample location, borehole number, and total soil-vapor VOC result (ppbv) at 10 and 30 ft. (duplicate)

1994 Third-round sample location, borehole number, and total soil-vapor VOC result (ppbv) at 10 and 30 ft. (duplicate)

2008 sample location, borehole number, and total soil-vapor VOC result (ppbv) at 10 & 30 ft. (two values) and 10, 30, & 50 ft. (three values) (duplicate)

Former MWL Boundary

Toe of Landfill Subgrade

Trench & Pit location

Edge of unpaved Road

Figure 5-6
1994 and 2008 Soil-Vapor Total Volatile Organic Compound (VOC) Sampling Locations and Sample Results at 10-, 30-, and 50-Foot Depths at the Mixed Waste Landfill

0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.04330000 B4

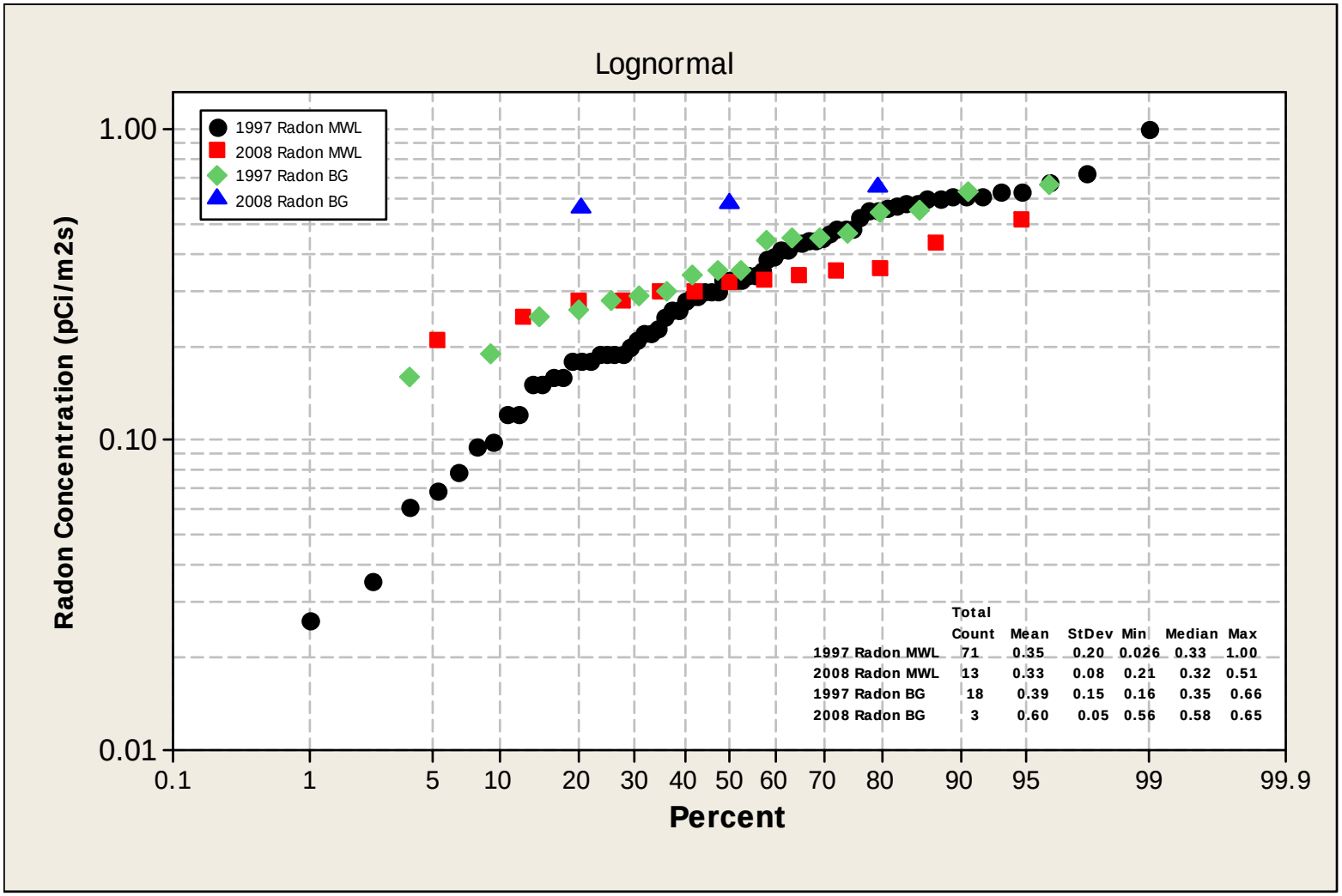


Figure 6-1
Comparison of 1997 and 2008 Radon Sample Analytical Results at the Mixed Waste Landfill

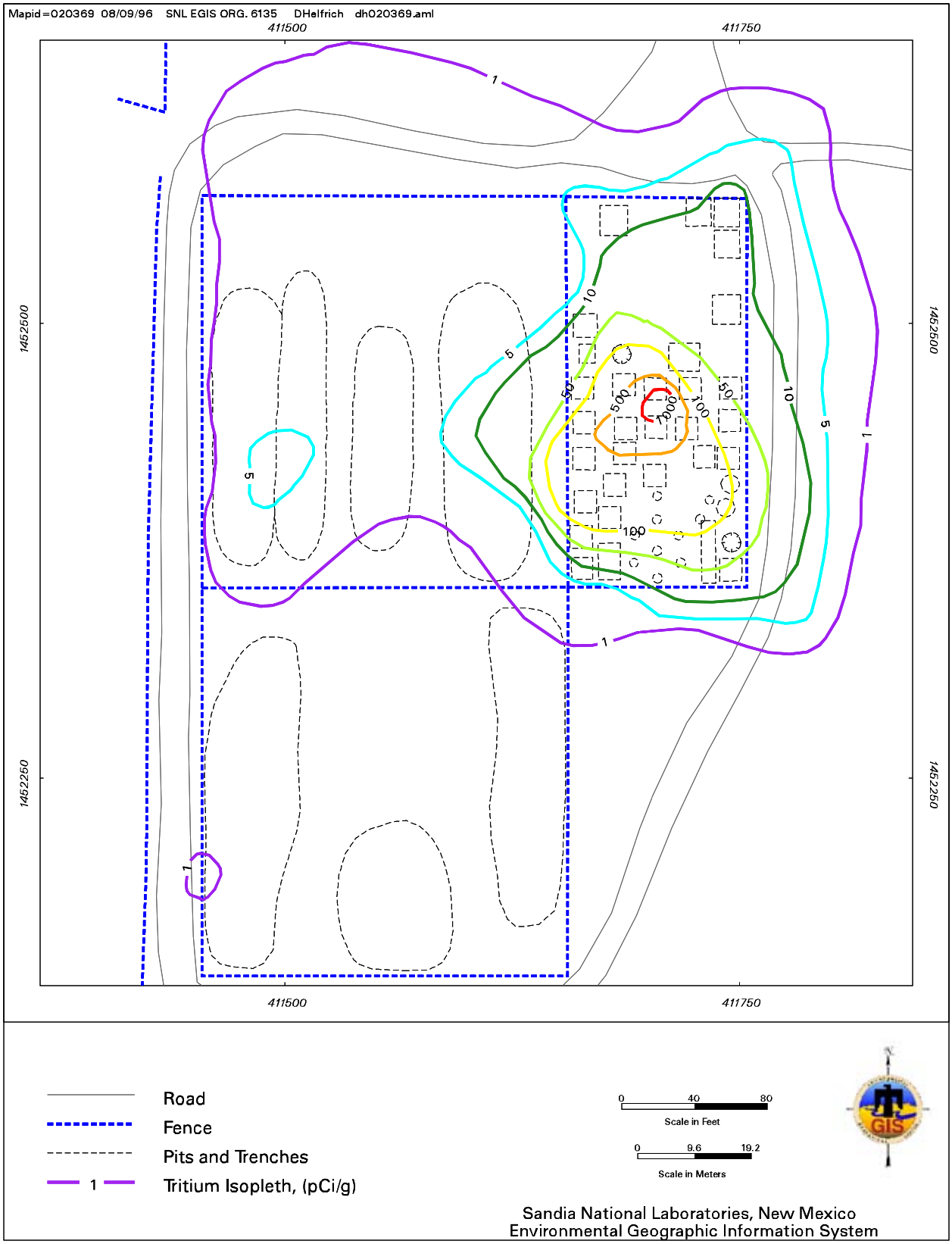


Figure 6-2
1993 Tritium Surface Soil Sampling Results at the Mixed Waste Landfill

Legend

DP1 — 7.54E+04: 2008 Tritium Sampling Location and Result (pCi/L) at 10-ft. depth (duplicate)

BH-1: 1995 Tritium Sampling Location

Toe of Landfill Subgrade

Trench & Pit location, former MWL Boundary

Edge of unpaved Road

E+04: Tritium Concentration Isopleth (pCi/L), dashed where inferred

Figure 6-3
2008 Tritium Soil Sample Concentration Isopleths at the 10-Foot Depth at the Mixed Waste Landfill

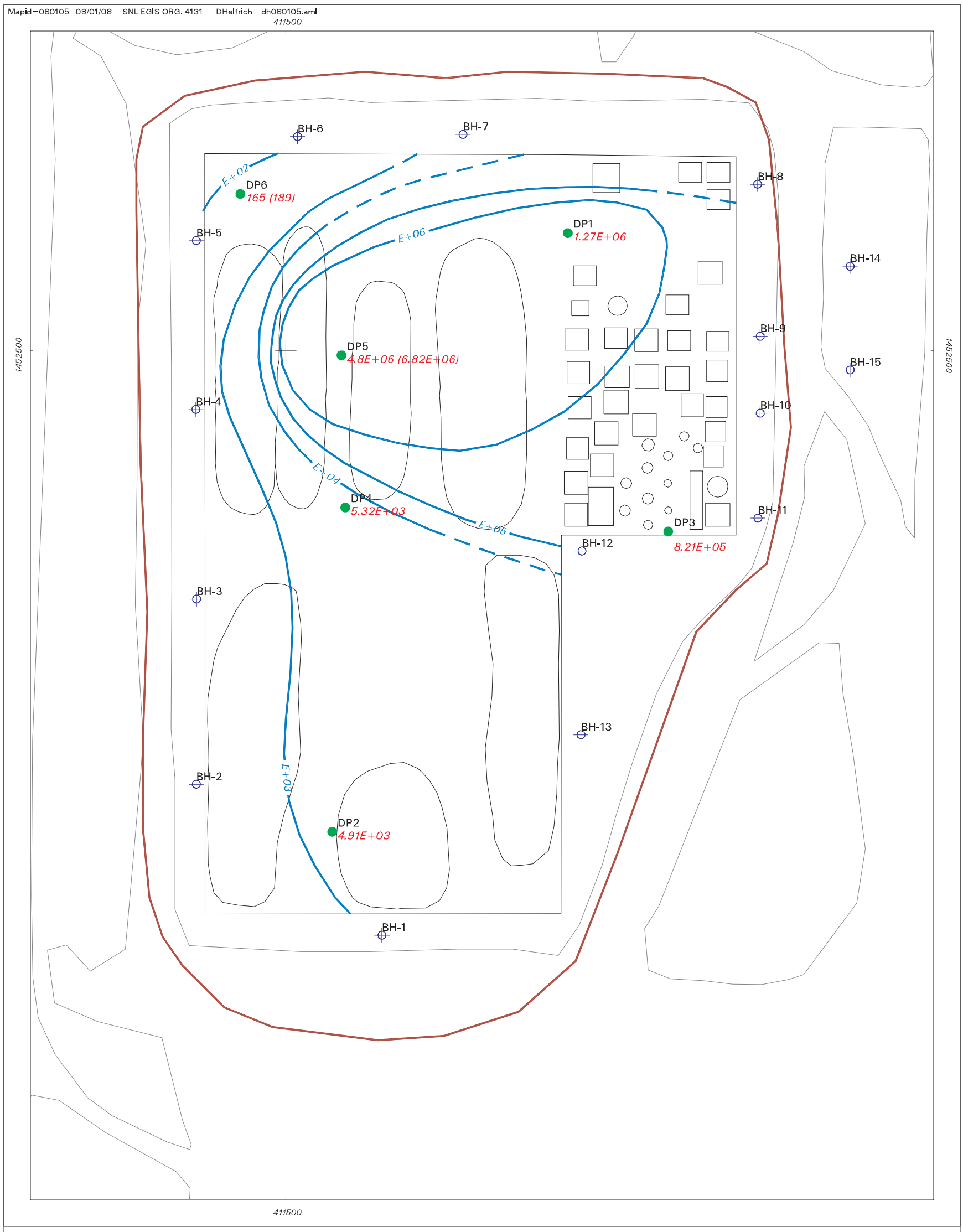
0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.04330000 B7

Mapid=080105 08/01/08 SNL EGIS ORG. 4131 DHelfrich dh080105.aml



Legend

DP1 1.27E+06 — 2008 Tritium Sampling Location and Result (pCi/L) at 30-ft. depth (duplicate)

BH-1 — 1995 Tritium Sampling Location

Toe of Landfill Subgrade

Trench & Pit location, former MWL Boundary

Edge of unpaved Road

E+04 — Tritium Concentration Isopleth (pCi/L), dashed where inferred

Figure 6-4
2008 Tritium Soil Sample Concentration Isopleths at the 30-Foot Depth at the Mixed Waste Landfill

0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.04330000 B8

Legend

DP3 5.15E+03 — 2008 Tritium Sampling Location and Result (pCi/L) at 50-ft. depth (duplicate)

BH-1 — 1995 Tritium Sampling Location

Toe of Landfill Subgrade

Trench & Pit location, former MWL Boundary

Edge of unpaved Road

E+04 — Tritium Concentration Isopleth (pCi/L), dashed where inferred

Figure 6-5
2008 Tritium Soil Sample Concentration Isopleths at the 50-Foot Depth at the Mixed Waste Landfill

0 60 120
Scale in Feet

0 14 28
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

840857.04330000 B9

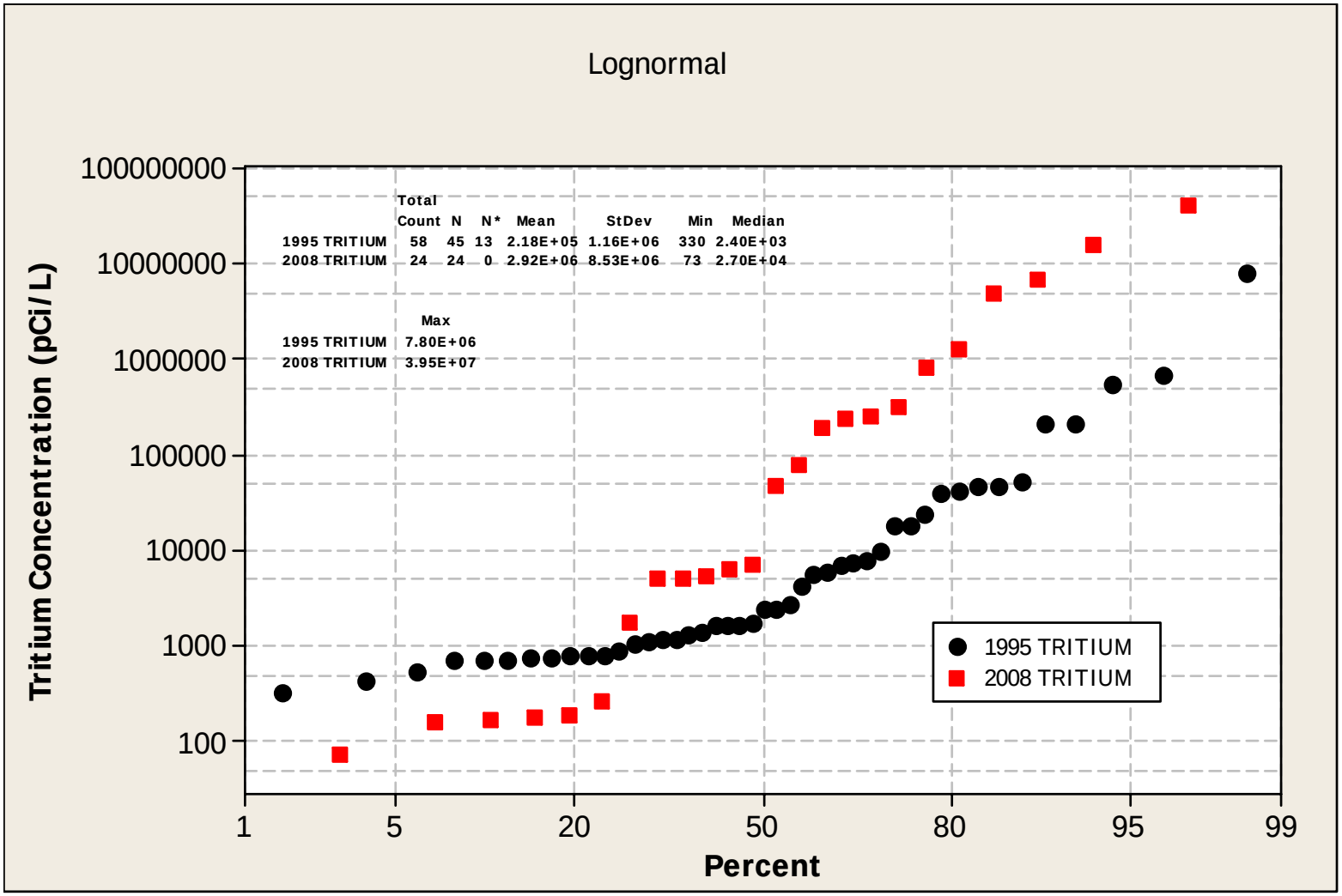


Figure 6-6
Comparison of 1997 and 2008 Tritium Soil Sample
Analytical Results for 10-, 30-, and 50-Foot-Depth Samples at the Mixed Waste Landfill

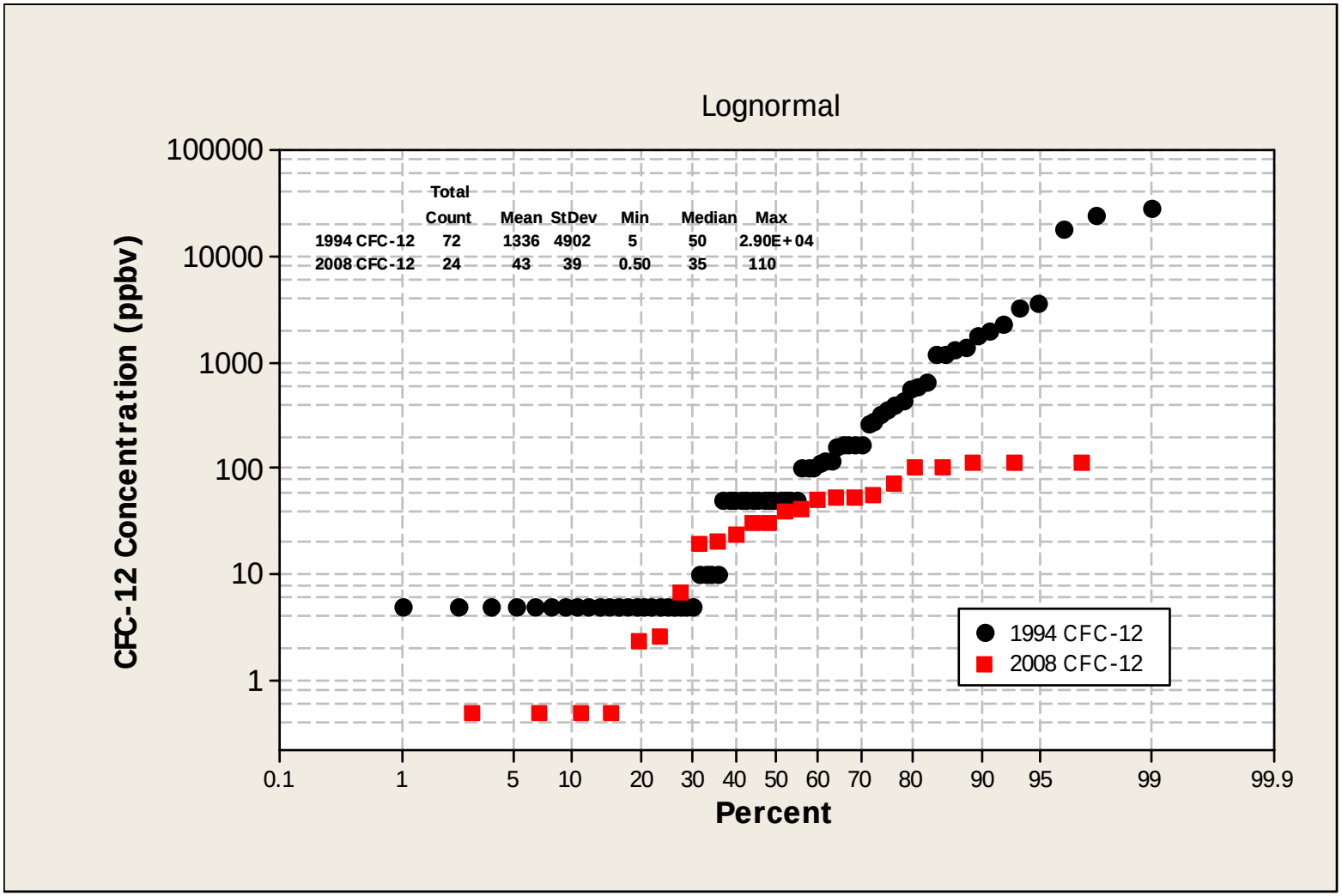


Figure 6-7
Comparison of 1994 and 2008 CFC-12 Soil-Vapor Sample Analytical Results at the Mixed Waste Landfill

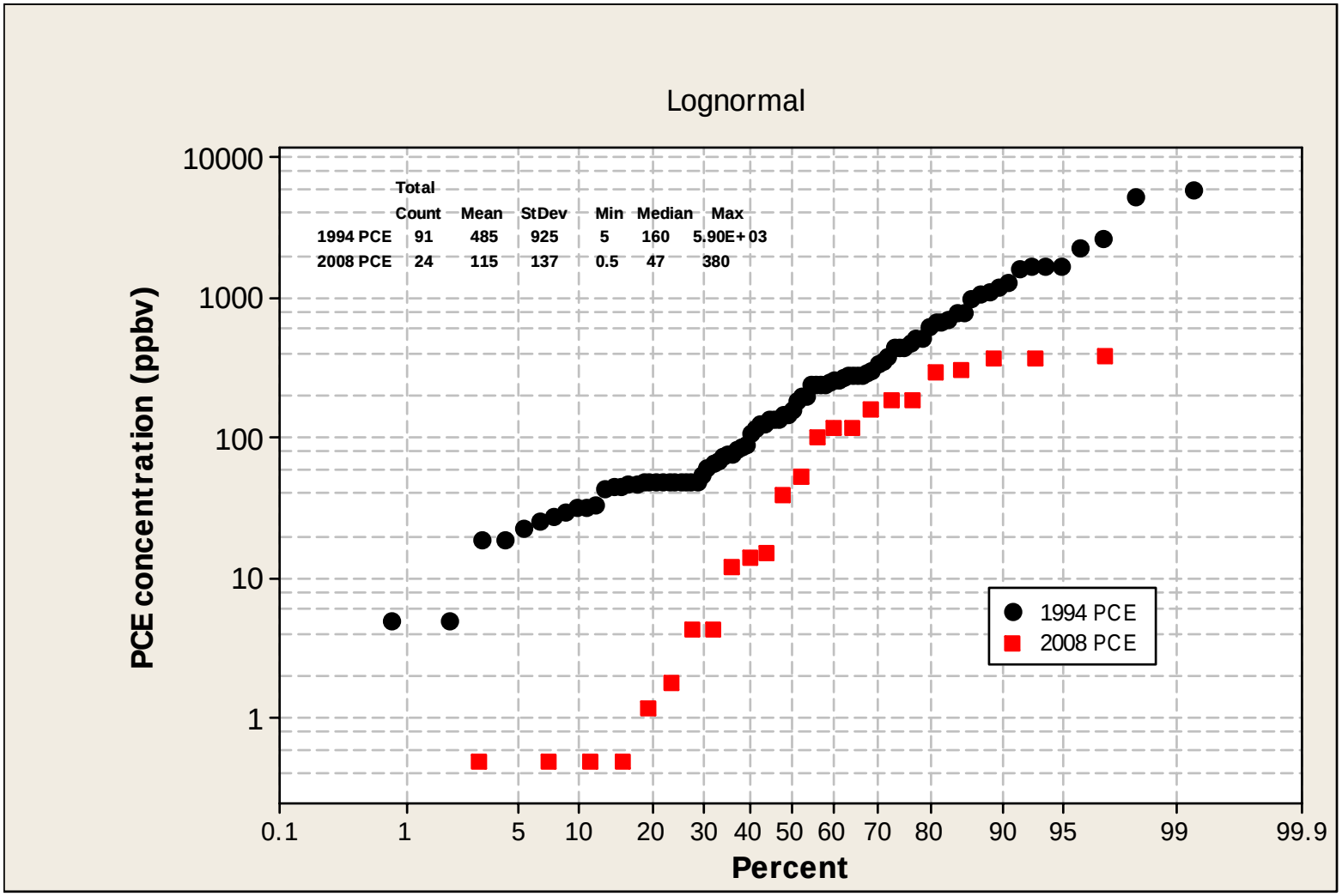


Figure 6-8
Comparison of 1994 and 2008 PCE Soil-Vapor Sample Analytical Results at the Mixed Waste Landfill

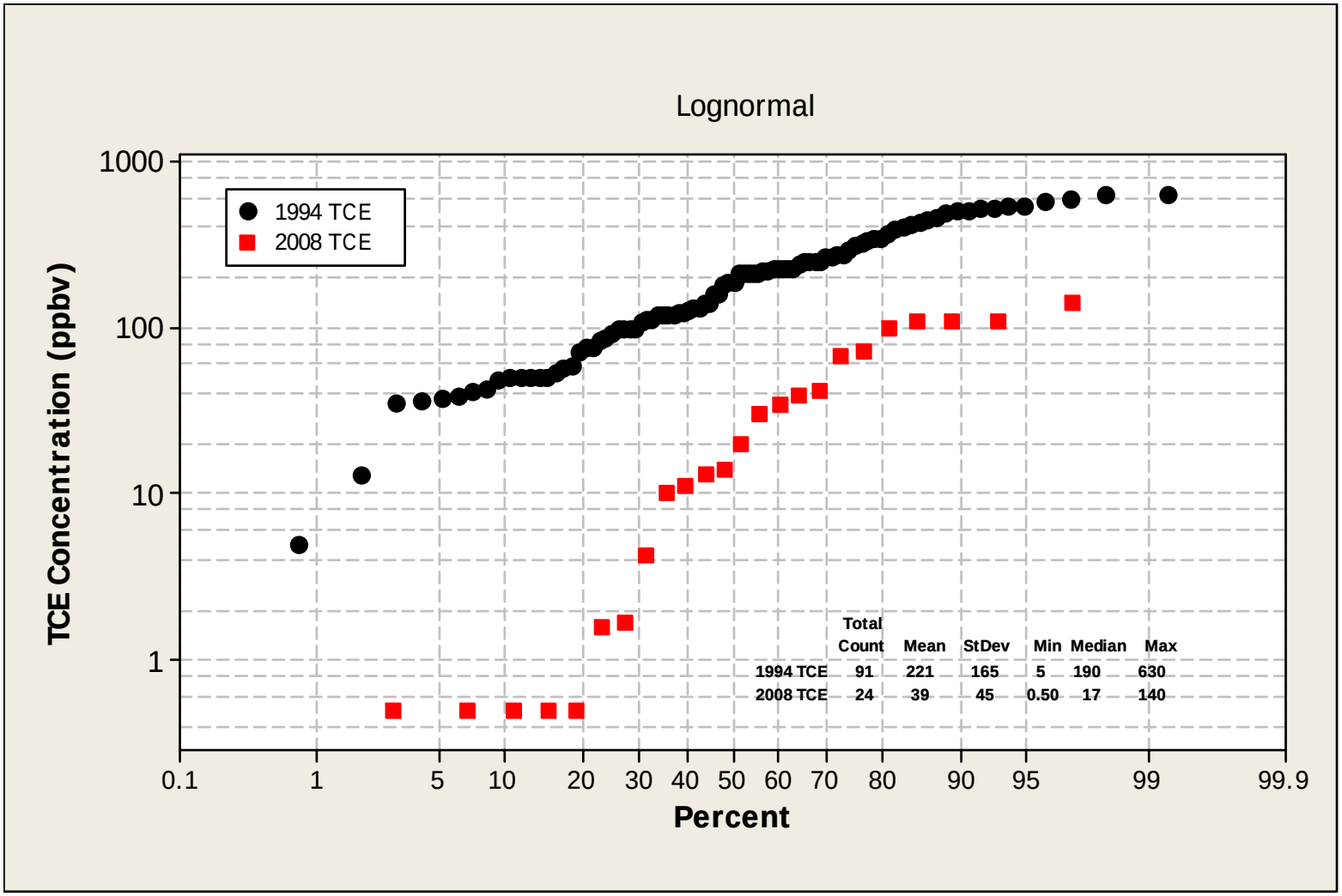


Figure 6-9
Comparison of 1994 and 2008 TCE Soil-Vapor Sample Analytical Results at the Mixed Waste Landfill

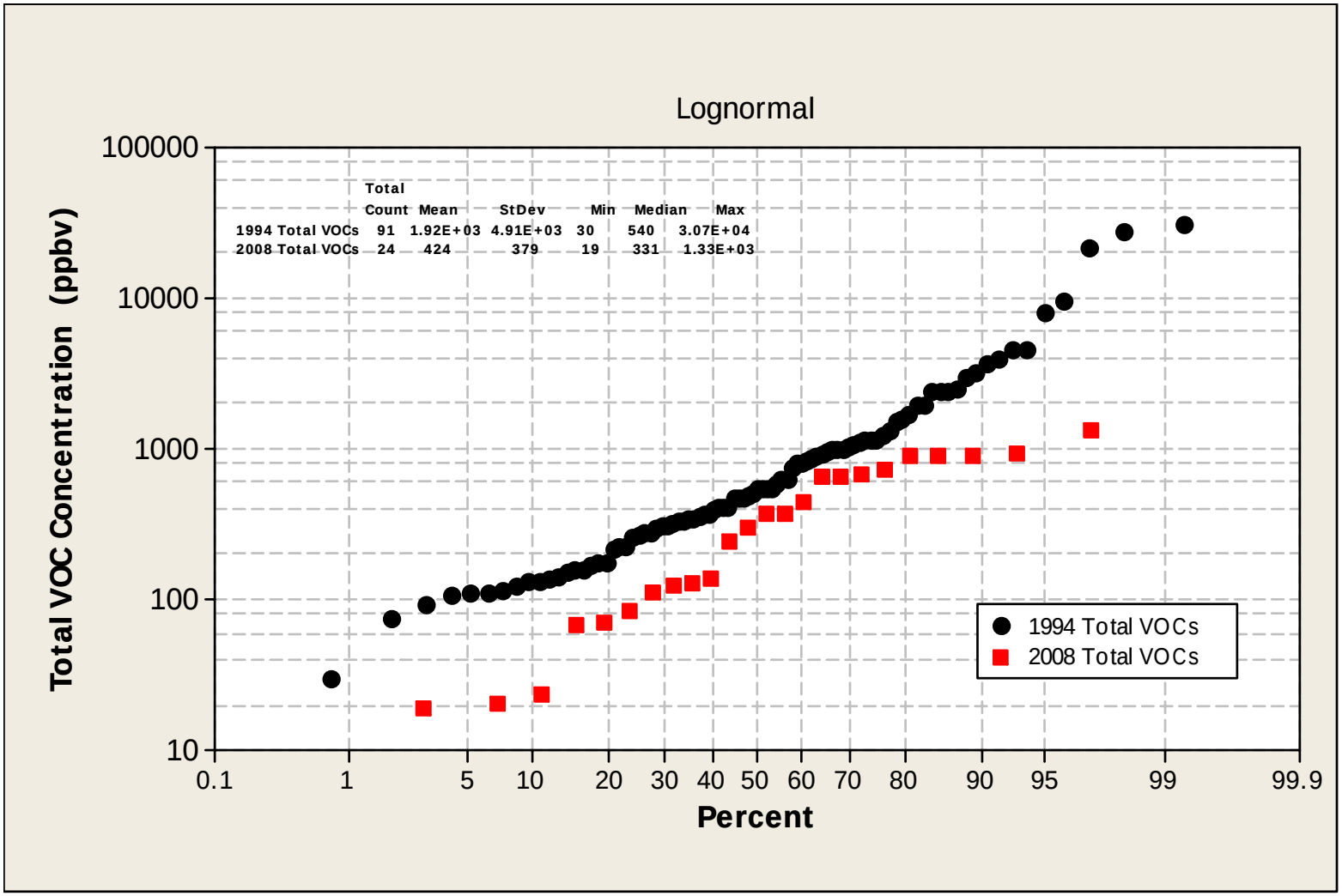


Figure 6-10
Comparison of 1994 and 2008 Total VOC Soil-Vapor Sample Analytical Results at the Mixed Waste Landfill

TABLES

Table 4-1
Summary of 2008 Radon Sample IDs and Locations at the Mixed Waste Landfill

Sampling Location (Figure 4-1)	Sample Description	Sample ID
RN1	Surface of the MWL	MWL-RN1
RN2	Surface of the MWL	MWL-RN2
RN3	Surface of the MWL	MWL-RN3
RN4	Surface of the MWL	MWL-RN4
RN5	Surface of the MWL	MWL-RN5
RN6	Surface of the MWL	MWL-RN6
RN7	Surface of the MWL	MWL-RN7
RN8	Surface of the MWL	MWL-RN8
RN9	Surface of the MWL	MWL-RN9
RN10	Background surface location, southeast of the MWL	MWL-RN10
RN11	Background surface location, northeast of the MWL	MWL-RN11
RN12	Background surface location, northwest of the MWL	MWL-RN12

ID = Identification number.
MWL = Mixed Waste Landfill.
RN = Radon.

Table 4-2
Summary of 2008 Soil-Vapor VOC and Tritium Soil Sample IDs and Sample Depths at the Mixed Waste Landfill

Sampling Location (Figure 4-1)	Boring Location	Borehole ID	Soil-Vapor VOC Sample ID	Soil Tritium Sample ID	Sample Depths (ft) (below original landfill surface)	Soil-Vapor VOC Duplicate Sample ID	Soil Tritium Duplicate Sample ID
DP1	MWL	MWL-DP1	MWL-DP1-10-SG MWL-DP1-30-SG	MWL-DP1-10-S MWL-DP1-30-S	10 30	NA	NA
DP2	MWL	MWL-DP2	MWL-DP2-10-SG MWL-DP2-30-SG MWL-DP2-50-SG	MWL-DP2-10-S MWL-DP2-30-S MWL-DP2-50-S	10 30 50	NA	NA
DP3	MWL	MWL-DP3	MWL-DP3-10-SG MWL-DP3-30-SG MWL-DP3-50-SG	MWL-DP3-10-S MWL-DP3-30-S MWL-DP3-50-S	10 30 50	NA	NA
DP4	MWL	MWL-DP4	MWL-DP4-10-SG MWL-DP4-30-SG	MWL-DP4-10-S MWL-DP4-30-S	10 30	NA	NA
DP5	MWL	MWL-DP5	MWL-DP5-10-SG MWL-DP5-30-SG MWL-DP5-50-SG	MWL-DP5-10-S MWL-DP5-30-S MWL-DP5-50-S	10 30 50	MWL-DP5-10-SG-DUP MWL-DP5-30-SG-DUP MWL-DP5-50-SG-DUP	MWL-DP5-10-S-DUP MWL-DP5-30-S-DUP MWL-DP5-50-S-DUP
DP6	MWL	MWL-DP6	MWL-DP6-10-SG MWL-DP6-30-SG	MWL-DP6-10-S MWL-DP6-30-S	10 30	MWL-DP6-10-SG-DUP MWL-DP6-30-SG-DUP	MWL-DP6-10-S-DUP MWL-DP6-30-S-DUP
DP7	Approximately 525 ft southwest of the MWL	MWL-DP7	MWL-DP7-10-SG MWL-DP7-30-SG	MWL-DP7-10-S MWL-DP7-30-S	10 30	NA	NA
DP8	Approximately 665 ft southwest of the MWL	MWL-DP8	MWL-DP8-10-SG MWL-DP8-30-SG	MWL-DP8-10-S MWL-DP8-30-S	10 30	NA	NA
Equipment Blank	NA	NA	NA	MWL-EB1, -EB2, etc.	NA	NA	NA

DP = Direct-push.
DUP = Duplicate.
EB = Equipment blank.
ft = Foot (feet).
ID = Identification number.
MWL = Mixed Waste Landfill.
NA = Not applicable.
S = Soil.
SG = Soil-gas.
VOC = Volatile organic compound.

Table 5-1
Summary of 1997 and 2008 Radon Sampling Results at the Mixed Waste Landfill

Location ID (Figure 5-1)	Flux pCi/m^{2}s	Flux Error pCi/m^{2}s	LLD pCi/m^{2}s
September–October 1997 MWL Samples			
1	0.413	0.17	0.26
2	0.33	0.15	0.22
3	0.44	0.17	0.25
4	0.30	0.27	0.43
5	0.68	0.18	0.26
6	0.58	0.28	0.43
7	0.55	0.28	0.43
8	0.15	0.16	0.25
9	0.28	0.16	0.25
10	0.44	0.15	0.22
11	0.43	0.17	0.25
12	0.061	0.16	0.26
13	0.63	0.29	0.43
14	0.095	0.15	0.24
15	0.52	0.28	0.43
16	0.35	0.17	0.26
17	0.16	0.16	0.26
18	0.099	0.16	0.25
19	0.30	0.16	0.25
20	0.30	0.28	0.44
21	0.23	0.17	0.26
22	0.39	0.16	0.25
23	0.45	0.17	0.26
24	0.18	0.16	0.26
25	0.19	0.14	0.22
26	0.26	0.16	0.25
27	0.33	0.15	0.22
28	0.33	0.16	0.24
29	0.026	0.16	0.26
30	0.20	0.16	0.26
31	0.61	0.28	0.43
32	0.58	0.17	0.25
33	0.18	0.16	0.26
34	0.18	0.16	0.26
35	0.19	0.16	0.26
36	0.25	0.16	0.25
37	0.38	0.17	0.25
38	0.29	0.16	0.24
39	0.19	0.17	0.26
40	0.12	0.16	0.26
41	0.41	0.17	0.26
42	0.60	0.17	0.25
43	0.19	0.16	0.16

Refer to footnotes at end of table.

Table 5-1 (Continued)
Summary of 1997 and 2008 Radon Sampling Results at the Mixed Waste Landfill

Location ID (Figure 5-1)	Flux pCi/m^{2}s	Flux Error pCi/m^{2}s	LLD pCi/m^{2}s
September–October 1997 MWL Samples (Continued)			
44	0.72	0.29	0.29
45	0.15	0.16	0.26
46	0.33	0.16	0.24
47	0.57	0.15	0.22
48	0.43	0.15	0.22
49	0.12	0.16	0.26
50	0.22	0.17	0.26
51	0.61	0.18	0.26
52	0.34	0.17	0.25
53	0.48	0.17	0.25
54	0.26	0.14	0.22
55	0.22	0.16	0.25
56	0.60	0.18	0.26
57	0.61	0.17	0.25
58	0.21	0.15	0.24
59	0.29	0.14	0.22
60	0.035	0.13	0.22
61	0.55	0.18	0.26
62	0.48	0.16	0.24
63	0.069	0.14	0.22
64	1.0	0.19	0.25
65	0.078	0.15	0.25
66	0.63	0.18	0.26
67	0.56	0.17	0.25
68	0.48	0.18	0.26
69	0.46	0.15	0.22
70	0.34	0.27	0.43
71	0.16	0.16	0.26
September–October 1997 Background Samples			
A	0.16	0.16	0.25
B	0.25	0.17	0.26
C	0.29	0.16	0.25
D	0.35	0.17	0.26
E	0.54	0.18	0.26
F	0.55	0.18	0.26
G	0.45	0.17	0.26
H	0.26	0.17	0.26
I	0.44	0.17	0.26
J	0.45	0.17	0.25
K	0.19	0.15	0.26
L	0.34	0.17	0.26
M	0.63	0.17	0.24
N	0.35	0.17	0.25

Refer to footnotes at end of table.

Table 5-1 (Concluded)
Summary of 1997 and 2008 Radon Sampling Results at the Mixed Waste Landfill

Location ID (Figure 5-1)	Flux pCi/m^2s	Flux Error pCi/m^2s	LLD pCi/m^2s
September–October 1997 Background Samples (Continued)			
O	0.46	0.18	0.26
P	0.66	0.29	0.43
Q	0.28	0.15	0.22
R	0.30	0.16	0.24
April 2008 MWL Samples			
RN1	0.35	0.04	0.1
RN1 DUP	0.36	0.04	0.1
RN2	0.43	0.04	0.1
RN3	0.21	0.04	0.1
RN3 DUP	0.30	0.04	0.1
RN3 DUP	0.25	0.04	0.1
RN4	0.30	0.04	0.1
RN5	0.33	0.04	0.1
RN6	0.32	0.04	0.1
RN7	0.51	0.04	0.1
RN8	0.28	0.04	0.1
RN8 DUP	0.28	0.04	0.1
RN9	0.34	0.04	0.1
April 2008 Background Samples			
RN10	0.65	0.04	0.1
RN11	0.56	0.04	0.1
RN12	0.58	0.04	0.1

DUP = Duplicate.
ID = Identification number.
LLD = Lower limit of detection.
MWL = Mixed Waste Landfill.
pCi/m^2s = Picocuries per meter squared per second.

Table 5-2
Summary of 1995 and 2008 Tritium Soil Sampling Results at the Mixed Waste Landfill

Sample Attributes			Tritium Activity (EPA Method 906.0[a]) (pCi/L)	
Record Number[b]	ER Sample ID	True Sample Depth (ft)[c]	Result	Error[d]
1995 Samples				
3381	BH-1-10	9	**700**	220
3387	BH-2-10	9	**790**	230
3174	BH-3-10	9	**1.72E+03**	370
3198	BH-4-10	9	**1.65E+03**	350
3226	BH-5-10	9	**4.28E+03**	490
3425	BH-6-10	9	**2.43E+03**	330
3445	BH-7-10	9	**2.65E+03**	440
3438	BH-8-10	9	**9.53E+03**	760
3449	BH-9-10	9	**2.35E+04**	1.30E+03
3449	BH-10-10	9	**4.74E+04**	2.10E+03
3456	BH-11-10	9	**7.00E+03**	560
3441	BH-12-10	9	**6.70E+05**	2.40E+04
3432	BH-13-10	9	**1.16E+03**	290
3465	BH-14-10	10	**1.68E+03**	340
3465	BH-15-10	10	**4.03E+04**	2.00E+03
3381	BH-1-30	26	**790**	400
3213	BH-1-30-DUP	26	**900**	240
3387	BH-2-30	26	ND (89)	160
3174	BH-3-30	26	ND (180)	380
3198	BH-4-30	26	**780**	520
3198	BH-4-30-DUP	26	**1.10E+03**	530
3226	BH-5-30	26	ND (100)	260
3425	BH-6-30	26	**5.89E+03**	530
3425	BH-6-30-DUP	26	**5.64E+03**	520
3445	BH-7-30	26	ND (130)	200
3445	BH-7-30-DUP	26	ND (130)	260
3438	BH-8-30	26	**7.40E+03**	660
3438	BH-8-30-DUP	26	**8.05E+03**	580
3449	BH-9-30	26	**4.68E+04**	2.20E+03
3449	BH-9-30-DUP	26	**4.30E+04**	2.00E+03
3449	BH-10-30	26	**5.46E+05**	2.00E+04
3456	BH-11-30	26	**1.15E+03**	430
3456	BH-11-30-DUP	26	**1.31E+03**	450
3459	BH-12-30	26	**7.80E+06**	2.80E+05
3432	BH-13-30	26	ND (110)	170
3432	BH-13-30-DUP	26	**710**	250
3465	BH-14-30	30	**730**	260
3465	BH-14-30-DUP	30	**710**	260
3465	BH-15-30	30	**2.40E+03**	380
3465	BH-15-30-DUP	30	**1.60E+03**	410
3213	BH-1-50	43	ND (92)	170
3387	BH-2-50	43	ND (89)	150
Tritium Background Soil Concentration at SNL/NM[e]			420	NA

Refer to footnotes at end of table.

Table 5-2 (Continued)
Summary of 1995 and 2008 Tritium Soil Sampling Results at the Mixed Waste Landfill

Sample Attributes			Tritium Activity (EPA Method 906.0[a]) (pCi/L)	
Record Number[b]	ER Sample ID	True Sample Depth (ft)[c]	Result	Error[d]
1995 Samples (Continued)				
3177	BH-3-50	43	ND (190)	420
3198	BH-4-50	43	ND (130)	230
3226	BH-5-50	43	ND (130)	310
3226	BH-5-50-DUP	43	**430**	230
3425	BH-6-50	43	ND (130)	250
3445	BH-7-50	43	ND (140)	340
3438	BH-8-50	43	**530**	220
3449	BH-9-50	43	**1.86E+04**	1.10E+03
3449	BH-10-50	43	**1.81E+04**	1.10E+03
3449	BH-10-50-DUP	43	**5.13E+04**	2.40E+03
3456	BH-11-50	43	**1.06E+03**	360
3459	BH-12-50	43	**2.11E+05**	8.00E+03
3459	BH-12-50-DUP	43	**2.15E+05**	8.20E+03
3432	BH-13-50	43	330	220
3465	BH-14-50	50	**1.38E+03**	320
3465	BH-15-50	50	**750**	290
2008 Samples				
611879	DP1-10-S	10	**7.54E+04**	1.04E+04
611873	DP2-10-S	10	**4.71E+04**	6.64E+03
611872	DP3-10-S	10	**1.89E+05**	2.60E+04
611875	DP4-10-S	10	**2.50E+05**	3.44E+04
611868	DP5-10-S	10	**3.95E+07 J**	5.44E+06
611868	DP5-10-S-DUP	10	**1.57E+07 J**	2.16E+06
611877	DP6-10-S	10	**6.82E+03**	1.00E+03
611877	DP6-10-S-DUP	10	**6.11E+03**	906
611813	DP7-10-S	10	156 J	94.4
611813	DP8-10-S	10	ND (64)	85.1
611879	DP1-30-S	30	**1.27E+06**	1.75E+05
611873	DP2-30-S	30	**4.91E+03**	903
611872	DP3-30-S	30	**8.21E+05**	1.13E+05
611875	DP4-30-S	30	**5.32E+03**	956
611868	DP5-30-S	30	**4.80E+06 J**	6.62E+05
611868	DP5-30-S-DUP	30	**6.82E+06 J**	9.39E+05
611877	DP6-30-S	30	165 J	94.2
611877	DP6-30-S-DUP	30	189 J	96.7
611813	DP7-30-S	30	180 J	97.8
611813	DP8-30-S	30	260 J	109
611873	DP2-50-S	50	**1.70E+03**	496
611872	DP3-50-S	50	**5.15E+03**	780
611868	DP5-50-S	50	**2.41E+05 J**	3.32E+04
611868	DP5-50-S-DUP	50	**3.19E+05 J**	4.40E+04
Tritium Background Soil Concentration at SNL/NM[e]			420	NA

Refer to footnotes at end of table.

Table 5-2 (Concluded)
Summary of 1995 and 2008 Tritium Soil Sampling Results at the Mixed Waste Landfill

Sample Attributes			Tritium Activity (EPA Method 906.0[a]) (pCi/L)	
Record Number[b]	ER Sample ID	True Sample Depth (ft)[c]	Result	Error[d]
2008 Quality Assurance/Quality Control Samples (pCi/L)				
611813	EB1	NA	ND (67)	77.4
611868	EB2	NA	ND (75.2)	86.7
611868	EB3	NA	ND (75.6)	89.3
611872	EB4	NA	ND (90.4)	104
611872	EB5	NA	ND (58.4)	75.3
611873	EB6	NA	ND (88.6)	104
611873	EB7	NA	ND (87.9)	105
611873	EB8	NA	ND (89.3)	105
611875	EB9	NA	ND (82.1)	95.8
611877	EB10	NA	ND (72.1)	89.7
611877	EB11	NA	ND (85.9)	105
611879	EB12	NA	ND (79.6)	90.4
611879	EB13	NA	ND (80.3)	84.6

Note: Values in **bold** exceed SNL/NM background tritium concentration.
[a]EPA August 1980.
[b]Analysis Request/Chain-of-Custody record.
[c]1995 Boreholes BH-1 through BH-13 were drilled at an angle of 30 degrees from vertical, and BH-14 and BH-15 were drilled vertically. All 2008 boreholes were drilled vertically. Sample depths reported in this table are true depths below the original MWL surface grade.
[d]Two standard deviations about the mean detected activity.
[e]Tharp February 1999.

BH = Borehole.
DP = Direct-push.
DUP = Duplicate.
EB = Equipment blank.
EPA = U.S Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification number.
J = Estimated concentration. See data validation report (Appendix C).
MDL = Method detection limit.
MWL = Mixed Waste Landfill.
NA = Not applicable.
ND = Not detected above the MDL, shown in parentheses.
pCi/L = Picocuries per liter.
S = Soil.
SNL/NM = Sandia National Laboratories/New Mexico.

Table 5-3
Summary of 2008 Tritium Soil Sample Concentration Ranges at the Mixed Waste Landfill

Depth (ft bgs)[a]	Tritium Concentration Range (pCi/L)	Location with the Maximum Concentration	Depth Interval Mean
MWL Boreholes DP1–DP6			
10 ft	6.11E+03–3.95E+07 J	DP5	6.97E+06
30 ft	165 J–6.82E+06 J	DP5	1.72E+06
50 ft	1.70E+03–3.19E+05 J	DP5	1.42E+05
Background Boreholes DP7 and DP8			
10 ft	ND–156 J	DP7	94
30 ft	180 J–260 J	DP8	220

Note: For mean calculations, ND values set at a tritium concentration of one-half of the MDA.
[a]Depth below the original MWL surface grade.
bgs = Below ground surface.
DP = Direct-push.
ft = Foot (feet).
J = Estimated concentration. See data validation report (Appendix C).
MDA = Minimum detectable activity.
MWL = Mixed Waste Landfill.
ND = Not detected.
pCi/L = Picocuries per liter.

Table 5-4
Summary of 2008 Tritium Soil Sample RPD Values for
Primary and Duplicate Samples at the Mixed Waste Landfill

Record Number[a]	ER Sample ID (Primary/Duplicate Samples)	Sample Depth (ft bgs)[b]	Primary Sample Tritium Concentration (pCi/L)	Duplicate Sample Tritium Concentration (pCi/L)	RPD[c]
611868	DP5-10-S / DP5-10-S-DUP	10	3.95E+07 J	1.57E+07 J	**86.23**
611868	DP5-30-S / DP5-30-S-DUP	30	4.80E+06 J	6.82E+06 J	**34.77**
611868	DP5-50-S / DP5-50-S-DUP	50	2.41E+05 J	3.19E+05 J	**27.86**
611877	DP6-10-S / DP6-10-S-DUP	10	6.82E+03	6.11E+03	**10.98**
611877	DP6-30-S / DP6-30-S-DUP	30	165 J	189 J	**13.56**

[a]Analysis Request/Chain-of-Custody record.
[b]Depth below the original MWL surface grade.
[c]RPD calculated as follows: $[(X_1 - X_2)/((X_1 + X_2)/2)] \times 100$ where X_1 and X_2 are the tritium concentrations in the primary and duplicate soil samples, respectively.
bgs = Below ground surface.
DP = Direct-push.
DUP = Duplicate.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification number.
J = Estimated concentration. See data validation report (Appendix C).
MWL = Mixed Waste Landfill.
pCi/L = Picocuries per liter.
RPD = Relative percent difference.
S = Soil.

Table 5-5
Summary of 1994 and 2008 Soil-Vapor Sample VOC Analytical Results for 10-Foot-Depth Samples at the Mixed Waste Landfill

Sample Attributes			VOCs (ppbv)			
Record Number[a]	ER Sample ID	Sample Depth (ft)	Dichloro-difluoromethane (CFC-12)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Total VOCs
1994 Round 1 samples (analyzed by an SNL/NM on-site laboratory with a GC/MS instrument)						
Unk	MWL-0N,10W (Rnd. 1, Pt. 1)	10	NA	251 Est	131	412
Unk	MWL-50S,10W (Rnd. 1, Pt. 2)	10	NA	521 Est	210	754
Unk	MWL-100S,10W (Rnd 1, Pt. 3)	10	NA	1.08E+03 Est	310 Est	1.51E+03
Unk	MWL-150S,10W (Rnd. 1, Pt. 4)	10	NA	627 Est	279 Est	1.17E+03
Unk	MWL-175S,10W (Rnd. 1, Pt. 5)	10	NA	339 Est	185	596
Unk	MWL-200S,10W (Rnd. 1, Pt. 6)	10	NA	186	114	358
Unk	MWL-10N,50E (Rnd. 1, Pt. 7)	10	NA	247 Est	124	371
Unk	MWL-10N,100E (Rnd 1, Pt. 8)	10	NA	205	123	340
Unk	MWL-10N,150E (Rnd. 1, Pt. 9)	10	NA	279 Est	210	541
Unk	MWL-10N,200E (Rnd. 1, Pt. 10)	10	NA	130	126	275
Unk	MWL-10N,250E (Rnd. 1, Pt. 11)	10	NA	87	86	173
Unk	MWL-10N,300E (Rnd. 1, Pt. 12)	10	NA	45	53	282
Unk	MWL-50S,310E (Rnd. 1, Pt. 13)	10	NA	30	72	115
Unk	MWL-100S,310E (Rnd. 1, Pt. 14)	10	NA	48	113	177
Unk	MWL-150S,310E (Rnd. 1, Pt. 15)	10	NA	33	93	135
Unk	MWL-200S,310E (Rnd. 1, Pt. 16)	10	NA	34	84	142
Unk	MWL-225S,300E (Rnd. 1, Pt. 17)	10	NA	32	76	125
Unk	MWL-225S,250E (Rnd. 1, Pt. 18)	10	NA	56	435 Est	542
Unk	MWL-225S,207E (Rnd. 1, Pt. 19)	10	NA	69	220	477
Soil-Vapor Trigger Levels[c]			NA	2.00E+04	2.00E+04	2.50E+04

Refer to footnotes at end of table.

Table 5-5 (Continued)
Summary of 1994 and 2008 Soil-Vapor Sample VOC Analytical Results for 10-Foot-Depth Samples at the Mixed Waste Landfill

Sample Attributes			VOCs (ppbv)			
Record Number[a]	ER Sample ID	Sample Depth (ft)	Dichloro-difluoromethane (CFC-12)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Total VOCs
1994 Round 2 (analyzed by an off-site commercial laboratory using EPA Method TO-14)						
622	MWL-60W/85S (Rnd. 2, Pt. 1)	10	ND (100)	110	ND (100)	110
622	MWL-60W/125S (Rnd. 2, Pt. 2)	10	ND (100)	160	ND (100)	160
622	MWL-60W/175S (Rnd. 2, Pt. 3)	10	ND (10)	77	51	298
622	MWL-60W/175S-D (Rnd. 2, Pt. 3 DUP)	10	ND (10)	91	58	179
622	MWL-10W/250S (Rnd. 2, Pt. 4)	10	ND (10)	62	39	158
622	MWL-125E/50S (Rnd. 2, Pt. 5)	10	ND (100)	240	100	340
622	MWL-125E/100S (Rnd. 2, Pt. 6)	10	170	240	ND (100)	410
622	MWL-125E/150S (Rnd. 2, Pt. 7)	10	400	310	100	810
622	MWL-125E/200S (Rnd. 2, Pt. 8)	10	320	200	110	630
622	MWL-75E/200S (Rnd. 2, Pt. 9)	10	1.80E+03 Sec	380	180	2.46E+03
622	MWL-75E/150S (Rnd. 2, Pt. 10)	10	2.90E+04 Est	1.70E+03	ND (1.00E+03)	**3.07E+04**
622	MWL-75E/100S (Rnd. 2, Pt. 11)	10	2.00E+03	5.20E+03 Sec	540	8.02E+03
622	MWL-75E/50S (Rnd. 2, Pt. 12)	10	ND (200)	1.70E+03	290	1.99E+03
1994 Round 3 (analyzed by an off-site commercial laboratory using EPA Method TO-14)						
919	MWL-300S/10W (Rnd. 3, Pt. 1)	10	ND (10)	130 Est	140 Est	326
919	MWL-350S/10W (Rnd. 3, Pt. 2)	10	ND (10)	44	36	111
919	MWL-400S/10W (Rnd. 3, Pt. 3)	10	ND (10)	ND (10)	ND (10)	30
919	MWL-BL/440S (Rnd. 3, Pt. 4)	10	ND (10)	ND (10)	13	74
919	MWL-50E/440S (Rnd. 3, Pt. 5)	10	ND (10)	26	35	225
919	MWL-100E/440S (Rnd. 3, Pt. 6)	10	ND (10)	19	42	153
919	MWL-150E/440S (Rnd. 3, Pt. 7)	10	ND (10)	23	43	131
919	MWL-200E/440S (Rnd. 3, Pt. 8)	10	ND (10)	28	49	92
1046	MWL-400S/210E (Rnd. 3, Pt. 9)	10	ND (10)	83	98	335
1046	MWL-350S/210E (Rnd. 3. Pt. 10)	10	ND (20)	260 Est	120	479
1046	MWL-300S/225E (Rnd. 3, Pt. 11)	10	ND (100)	ND (100)	120	310
919	MWL-250S/225E (Rnd. 3, Pt. 12)	10	ND (10)	76	230 Est	476
Soil-Vapor Trigger Levels[c]			NA	2.00E+04	2.00E+04	2.50E+04

Refer to footnotes at end of table.

Table 5-5 (Continued)
Summary of 1994 and 2008 Soil-Vapor Sample VOC Analytical Results for 10-Foot-Depth Samples at the Mixed Waste Landfill

Sample Attributes			VOCs (ppbv)			
Record Number[a]	ER Sample ID	Sample Depth (ft)	Dichloro-difluoromethane (CFC-12)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Total VOCs
2008 Soil-Vapor Data (analyzed by an off-site commercial laboratory using EPA Method TO-14A[b])						
611880	MWL-DP1-10-SG	10	39	15	14	240
611874	MWL-DP2-10-SG	10	20	12	11	123
611871	MWL-DP3-10-SG	10	55	53	39	658
611876	MWL-DP4-10-SG	10	70	120	34	446
611870	MWL-DP5-10-SG	10	40	160	10	366
611870	MWL-DP5-10-SG-DUP	10	24	380	20	736
611878	MWL-DP6-10-SG	10	31	1.2 J (2)	4.2	111
611878	MWL-DP6-10-SG-DUP	10	30	190	42	373
611812	MWL-DP7-10-SG	10	ND (1)	ND (1)	ND (1)	23
611812	MWL-DP8-10-SG	10	ND (1)	ND (1)	ND (1)	19
Soil-Vapor Trigger Levels[c]			NA	2.00E+04	2.00E+04	2.50E+04

Note: Values in **bold** exceed soil-vapor trigger level.
[a]Analysis request/chain-of-custody record.
[b]EPA January 1999.
[c]Soil vapor trigger levels for PCE, TCE, and total VOCs at the MWL presented in Section 5.2.3.1 of the Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill (SNL/NM September 2007a).

CFC-12 = Dichlorodifluoromethane.
DP = Direct-push.
DUP = Duplicate.
E = East.
Est = Estimated concentration greater than the upper limit of quantitation (1994 samples).
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
GC/MS = Gas chromatograph/mass spectrometer.
J = Estimated value between the MDL and PQL, shown in parentheses.
ID = Identification number.
MDL = Method detection limit.
MWL = Mixed Waste Landfill.
N = North.
NA = Not applicable.

Table 5-5 (Concluded)
Summary of 1994 and 2008 Soil-Vapor Sample VOC Analytical Results for 10-Foot-Depth Samples at the Mixed Waste Landfill

ND	= Not detected above the MDL, shown in parentheses.
PCE	= Tetrachloroethene.
PQL	= Practical quantitation limit.
Pt.	= Point.
ppbv	= Parts per billion by volume.
Rnd.	= Round.
S	= South.
Sec	= Results due to (secondary) dilution (1994 samples).
SG	= Soil-gas.
SNL/NM	= Sandia National Laboratories/New Mexico.
TCE	= Trichloroethene.
Unk	= Unknown.
VOC	= Volatile organic compound.
W	= West.

Table 5-6
Summary of 1994 and 2008 Soil-Vapor Sample VOC Analytical Results for 30-Foot-Depth Samples at the Mixed Waste Landfill

Sample Attributes			VOCs (EPA Method TO-14 [1994 samples] and TO-14A[a] [2008 samples]) (ppbv)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Dichlorodifluoromethane (CFC-12)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Total VOCs
1994 Round 1 Samples						
498	MWL-0N,10W (Rnd. 1, Pt. 1)	30	110	450	230	980
498	MWL-50S,10W (Rnd. 1, Pt. 2)	30	440	1.20E+03	450	2.51E+03
498	MWL-100S,10W (Rnd 1, Pt. 3)	30	1.30E+03	1.70E+03	530	3.96E+03
498	MWL-150S,10W (Rnd. 1, Pt. 4)	30	2.30E+03	1.30E+03	490	4.51E+03
498	MWL-175S,10W (Rnd. 1, Pt. 5)	26	640	240	120	1.00E+03
498	MWL-200S,10W (Rnd. 1, Pt. 6)	26	1.20E+03	670	330	2.42E+03
498	MWL-10N,50E (Rnd. 1, Pt. 7)	30	160	1.00E+03	460	1.93E+03
498	MWL-10N,100E (Rnd 1, Pt. 8)	30	120	800	400	1.61E+03
498	MWL-10N,150E (Rnd. 1, Pt. 9)	30	ND (100)	480	350	1.14E+03
498	MWL-10N,150E-D (Rnd. 1, Pt. 9 DUP)	30	100	450	320	1.14E+03
498	MWL-10N,200E (Rnd. 1, Pt. 10)	30	ND (100)	280	250	810
498	MWL-10N,250E (Rnd. 1, Pt. 11)	30	ND (100)	150	160	490
498	MWL-10N,300E (Rnd. 1, Pt. 12)	30	ND (100)	ND (100)	120	260
498	MWL-50S,310E (Rnd. 1, Pt. 13)	27	ND (100)	ND (100)	140	140
498	MWL-100S,310E (Rnd. 1, Pt. 14)	28	ND (100)	ND (100)	240	370
498	MWL-150S,310E (Rnd. 1, Pt. 15)	30	ND (100)	ND (100)	250	540
498	MWL-200S,310E (Rnd. 1, Pt. 16)	28	ND (100)	ND (100)	210	310
498	MWL-225S,300E (Rnd. 1, Pt. 17)	30	ND (100)	ND (100)	230	330
498	MWL-225S,250E (Rnd. 1, Pt. 18)	30	120	150	630	1.31E+03
498	MWL-225S,207E (Rnd. 1, Pt. 19)	30	280	260	630	2.40E+03
1994 Round 2 Samples						
622	MWL-60W/85S (Rnd. 2, Pt. 1)	30	170	450	230	1.01E+03
622	MWL-60W/125S (Rnd. 2, Pt. 2)	30	170	360	190	830
622	MWL-60W/175S (Rnd. 2, Pt. 3)	28.5	260	280	210	880
622	MWL-10W/250S (Rnd. 2, Pt. 4)	30	360	270	230	1.01E+03
622	MWL-125E/50S (Rnd. 2, Pt. 5)	30	170	520	270	1.13E+03
622	MWL-125E/100S (Rnd. 2, Pt. 6)	30	550	720	280	1.69E+03
622	MWL-125E/150S (Rnd. 2, Pt. 7)	30	1.40E+03 Sec	1.10E+03	540	3.71E+03
622	MWL-125E/200S (Rnd. 2, Pt. 8)	30	1.20E+03	790	520	3.21E+03
622	MWL-75E/200S (Rnd 2, Pt. 9)	25	3.20E+03 Sec	690	370	4.63E+03
Soil-Vapor Trigger Levels[c]			NA	2.00E+04	2.00E+04	2.50E+04

Refer to footnotes at end of table.

Table 5-6 (Continued)
Summary of 1994 and 2008 Soil-Vapor Sample VOC Analytical Results for 30-Foot-Depth Samples at the Mixed Waste Landfill

Sample Attributes			VOCs (EPA Method TO-14 [1994 samples] and TO-14A[a] [2008 samples]) (ppbv)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Dichlorodifluoromethane (CFC-12)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Total VOCs
1994 Round 2 Samples (Continued)						
622	MWL-75E/200S (Rnd 2, Pt. 10)	30	2.50E+04 Est	2.70E+03	ND (100)	**2.77E+04**
622	MWL-75E/200S (Rnd 2, Pt. 10 DUP)	30	1.80E+04 Sec	2.30E+03	600	2.20E+04
622	MWL-75E/100S (Rnd. 2, Pt. 11)	27	3.60E+03	5.90E+03	ND (1.00E+03)	9.50E+03
622	MWL-75E/50S (Rnd. 2, Pt. 12)	30	600	1.60E+03	570	3.01E+03
1994 Round 3 Samples						
919	MWL-300S/10W (Rnd. 3, Pt. 1)	30	ND (10)	300 Est	350 Est	893
919	MWL-350S/10W (Rnd. 3, Pt. 2)	30	ND (10)	140 Est	220 Est	626
919	MWL-400S/10W (Rnd. 3, Pt. 3)	30	ND (10)	45	77	517
919	MWL-400S/10W-D (Rnd. 3, Pt. 3 DUP)	30	ND (10)	50	60	272
919	MWL-BL/440S (Rnd. 3, Pt. 4)	30	ND (10)	19	38	107
919	MWL-50E/440S (Rnd. 3, Pt. 5)	30	ND (10)	47	99	222
919	MWL-100E/440S (Rnd. 3, Pt. 6)	30	ND (20)	50	130	216
919	MWL-150E/440S (Rnd. 3, Pt. 7)	30	ND (20)	68	160	392
919	MWL-200E/440S (Rnd. 3, Pt. 8)	30	ND (10)	77	210 Est	408
1046	MWL-400S/210E (Rnd. 3, Pt. 9)	30	ND (20)	120	250 Est	555
1046	MWL-350S/210E (Rnd. 3. Pt. 10)	30	ND (10)	280 Est	250 Est	929
1049	MWL-300S/225E (Rnd. 3, Pt. 11)	30	ND (10)	140	270	1.23E+03
919	MWL-250S/225E (Rnd. 3, Pt. 12)	30	ND (100)	140	390	1.03E+03
919	MWL-250S/225E-D (Rnd. 3, Pt. 12 DUP)	30	100	50	420	1.08E+03
2008 Samples						
611880	MWL-DP1-30-SG	30	6.8	1.8 J (2)	ND (1)	20
611874	MWL-DP2-30-SG	30	51	40	30	295
611871	MWL-DP3-30-SG	30	100	100	110	904
611876	MWL-DP4-30-SG	30	110	190	100	893
611870	MWL-DP5-30-SG	30	100	370	68	899
611870	MWL-DP5-30-SG-DUP	30	110	370	71	928
611878	MWL-DP6-30-SG	30	53	310	110	670
611878	MWL-DP6-30-SG-DUP	30	53	300	110	654
611812	MWL-DP7-30-SG	30	ND (1)	ND (1)	ND (1)	137
611812	MWL-DP8-30-SG	30	ND (1)	ND (1)	ND (1)	83
Soil-Vapor Trigger Levels[c]			NA	2.00E+04	2.00E+04	2.50E+04

Table 5-6 (Concluded)
Summary of 1994 and 2008 Soil-Vapor Sample VOC Analytical Results for 30-Foot-Depth Samples at the Mixed Waste Landfill

Note: Values in **bold** exceed soil-vapor trigger level.
[a]EPA January 1999.
[b]Analysis request/chain-of-custody record.
[c]Soil-vapor trigger levels for PCE, TCE, and total VOCs at the MWL presented in Section 5.2.3.1 of the Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill (SNL/NM September 2007a).

CFC-12	= Dichlorodifluoromethane.
DP	= Direct-push.
DUP	= Duplicate.
E	= East.
Est	= Estimated concentration greater than the upper limit of quantitation (1994 samples).
EPA	= U.S. Environmental Protection Agency.
ER	= Environmental Restoration.
ft	= Foot (feet).
J	= Estimated value between the MDL and PQL, shown in parentheses.
ID	= Identification number.
MDL	= Method detection limit.
MWL	= Mixed Waste Landfill.
N	= North.
NA	= Not applicable.
ND	= Not detected above the MDL, shown in parentheses.
PCE	= Tetrachloroethene.
PQL	= Practical quantitation limit.
Pt.	= Point.
ppbv	= Parts per billion by volume.
Rnd.	= Round.
S	= South.
Sec	= Results due to (secondary) dilution (1994 samples).
SG	= Soil-gas.
SNL/NM	= Sandia National Laboratories/New Mexico.
TCE	= Trichloroethene.
VOC	= Volatile organic compound.
W	= West.

Table 5-7
Summary of 2008 Soil-Vapor Sample VOC Analytical Results for 50-Foot-Depth Samples at the Mixed Waste Landfill

Sample Attributes			VOCs (EPA Method TO-14A[a]) (ppbv)			
Record Number[b]	ER Sample ID	Sample Depth (ft)	Dichlorodifluoromethane (CFC-12)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Total VOCs
611874	MWL-DP2-50-SG	50	19	14	13	126
611871	MWL-DP3-50-SG	50	110	120	140	1.33E+03
611870	MWL-DP5-50-SG	50	2.3	4.3	1.6 J (2)	67
611870	MWL-DP5-50-SG-DUP	50	2.6	4.4	1.7 J (2)	70
Soil-Vapor Trigger Levels[c]			NA	2.00E+04	2.00E+04	2.50E+04

[a]EPA January 1999.
[b]Analysis request/chain-of-custody record.
[c]Soil-vapor trigger levels for PCE, TCE, and total VOCs at the MWL presented in Section 5.2.3.1 of the Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill (SNL/NM September 2007a).

CFC-12 = Dichlorodifluoromethane.
DP = Direct push.
DUP = Duplicate.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification number.
J = Estimated value between the MDL and PQL, shown in parentheses.
MDL = Method detection limit.
MWL = Mixed Waste Landfill.
NA = Not applicable.
PCE = Tetrachloroethene.
ppbv = Parts per billion by volume.
PQL = Practical quantitation limit.
SG = Soil gas.
TCE = Trichloroethene.
VOC = Volatile organic compounds.

Table 5-8
Summary of 2008 Soil-Vapor Sample Methane Analytical Results at the Mixed Waste Landfill

Sample Attributes			Methane (Method ASTM D1946) (ppbv[b])
Record Number[a]	ER Sample ID	Sample Depth (ft)	
611880	MWL-DP1-10-SG	10	4.30E+03 J (4.40E+03)
611874	MWL-DP2-10-SG	10	ND (1.70E+03)
611871	MWL-DP3-10-SG	10	ND (1.90E+03)
611876	MWL-DP4-10-SG	10	ND (1.90E+03)
611870	MWL-DP5-10-SG	10	ND (1.40E+03)
611870	MWL-DP5-10-SG-DUP	10	ND (1.30E+03)
611878	MWL-DP6-10-SG	10	ND (1.90E+03)
611878	MWL-DP6-10-SG-DUP	10	ND (1.70E+03)
611812	MWL-DP7-10-SG	10	ND (2.00E+03)
611812	MWL-DP8-10-SG	10	ND (1.90E+03)
611880	MWL-DP1-30-SG	30	1.90E+03 J (5.30E+03)
611874	MWL-DP2-30-SG	30	ND (1.70E+03)
611871	MWL-DP3-30-SG	30	2.20E+05
611876	MWL-DP4-30-SG	30	4.60E+03 J (5.60E+03)
611870	MWL-DP5-30-SG	30	2.20E+03 J (4.20E+03)
611870	MWL-DP5-30-SG-DUP	30	2.20E+03 J (4.40E+03)
611878	MWL-DP6-30-SG	30	ND (1.90E+03)
611878	MWL-DP6-30-SG-DUP	30	ND (1.90E+03)
611812	MWL-DP7-30-SG	30	ND (1.50E+03)
611812	MWL-DP8-30-SG	30	ND (1.70E+03)
611874	MWL-DP2-50-SG	50	ND (1.70E+03)
611871	MWL-DP3-50-SG	50	5.40E+06
611870	MWL-DP5-50-SG	50	1.80E+03 J (4.40E+03)
611870	MWL-DP5-50-SG-DUP	50	1.80E+03 J (4.30E+03)

[a]Analysis request/chain-of-custody record.
[b]Methane results converted from "% (v/v)" units reported by laboratory to ppbv by multiplying laboratory value by 10,000,000.
ASTM = American Society for Testing and Materials.
DP = Direct-push.
DUP = Duplicate.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification number.
J = Estimated value between the MDL and PQL, shown in parentheses.
MDL = Method detection limit.
MWL = Mixed Waste Landfill.
ND = Not detected above the MDL, shown in parentheses.
ppbv = Parts per billion by volume.
PQL = Practical quantitation limit.
SG = Soil-gas.

Table 5-9
Summary of 2008 Soil-Vapor VOC and Methane Analytical MDLs at the Mixed Waste Landfill

Analyte	EPA Method TO-14A[a] Detection Limit (ppbv)
1,1,1-Trichloroethane	0.99–3.1
1,1,2,2-Tetrachloroethane	0.99–3.1
1,1,2-Trichloroethane	0.99–3.1
1,1-Dichloroethane	0.99–3.1
1,1-Dichloroethene	0.99–3.1
1,2,2-tetrafluoroethane, 1,2-Dichloro-1	0.99–3.1
1,2,4-Trichlorobenzene	2.5–7.9
1,2,4-Trimethylbenzene	1.3–4.1
1,2-Dibromoethane	0.99–3.1
1,2-Dichlorobenzene	0.89–2.8
1,2-Dichloroethane	0.99–3.1
1,2-Dichloropropane	1.5–4.7
1,3,5-Trimethylbenzene	1.1–3.5
1,3-Dichlorobenzene	0.79–2.5
1,4-Dichlorobenzene	3–9.4
2,2-trifluoroethane, 1,1,2-Trichloro-1	0.99–3.1
2-Butanone	2–6.3
2-Hexanone	2–6.3
4-Ethyltoluene	0.7–2.2
4-methyl-, 2-Pentanone	2–6.3
Acetone	2.5–7.9
Benzene	1.5–4.7
Benzyl chloride	7.9–25
Bromodichloromethane	0.99–3.1
Bromoform	0.5–1.6
Bromomethane	2–6.3
Carbon disulfide	2–6.3
Carbon tetrachloride	0.99–3.1
Chlorobenzene	0.99–3.1
Chloroethane	1.5–4.7
Chloroform	0.99–3.1
Chloromethane	0.99–3.1
Dibromochloromethane	0.99–3.1
Dichlorodifluoromethane	0.99–3.1
Ethyl benzene	0.99–3.1
Hexachlorobutadiene	1.3–4.1
Methane	1.50E+03–2.00E+03
Methylene chloride	0.79–2.5
Styrene	0.99–3.1
Tetrachloroethene	1–4.4
Toluene	0.99–3.1
Trichloroethene	0.99–3.1
Trichlorofluoromethane	0.99–6.9
Vinyl acetate	2–6.3
Vinyl chloride	1.5–4.7
cis-1,2-Dichloroethene	0.79–2.5
cis-1,3-Dichloropropene	1.5–4.7

Refer to footnotes at end of table.

Table 5-9 (Concluded)
Summary of 2008 Soil-Vapor VOC and Methane Analytical MDLs at the Mixed Waste Landfill

Analyte	EPA Method TO-14A[a] Detection Limit (ppbv)
m-, p-Xylene	2–6.3
o-Xylene	0.99–3.1
trans-1,3-Dichloropropene	0.99–3.1

[a]EPA January 1999.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
ppbv = Parts per billion by volume.
VOC = Volatile organic compound.

Table 5-10
Summary of 2008 CFC-12, PCE, TCE, and Total VOC Soil-Vapor Sample Concentration Ranges at the Mixed Waste Landfill

Sample Depth (ft bgs)[a]	CFC-12		PCE		TCE		Total VOCs		Methane	
	Range (ppbv)	Loc. with Max. Conc.	Range (ppbv)	Loc. with Max. Conc.	Range (ppbv)	Loc. with Max. Conc.	Range (ppbv)	Loc. with Max. Conc.	Range (ppbv)	Loc. with Max. Conc.
MWL Locations DP1–DP6										
10	20–70	DP4	1.2 J–380	DP5	4.2–42	DP6	111–736	DP5	ND–4.30E+03 J	DP1
30	6.8–110	DP4/ DP5	1.8 J–370	DP5	ND–110	DP3/ DP6	20–928	DP5	ND–2.20E+05	DP3
50	2.3–110	DP3	4.3–120	DP3	1.6 J–140	DP3	67–1.33E+03	DP3	ND–5.40E+06	DP3
Background Locations DP7 and DP8										
10	ND	NA	ND	NA	ND	NA	19–23	DP7	ND	NA
30	ND	NA	ND	NA	ND	NA	83–137	DP7	ND	NA

[a]Depth below the original MWL surface grade.
bgs = Below ground surface.
CFC-12 = Dichlorodifluoromethane.
Conc. = Concentration.
DP = Direct-push.
ft = Foot (feet).
J = Estimated concentration. See data validation report (Appendix E).
Loc. = Location.
Max. = Maximum.
MWL = Mixed Waste Landfill.
NA = Not applicable.
ND = Not detected.
PCE = Tetracholorethene.
ppbv = Parts per billion by volume.
TCE = Trichloroethene.
VOC = Volatile organic compound.

Table 5-11
Summary of 2008 CFC-12, PCE, TCE, Total VOCs, and Methane Soil-Vapor Sample RPD Values for Primary and Duplicate Samples at the Mixed Waste Landfill

Sample Attributes			Primary and Duplicate Sample Soil-Vapor Concentration (ppbv)				
Record Number[a]	ER Sample ID	Sample Depth (ft)[b]	CFC-12	PCE	TCE	Total VOCs	Methane
611870	DP5-10-SG	10	40	160	10	366	ND
611870	DP5-10-SG-DUP	10	24	380	20	736	ND
	DP5-10-SG / SG DUP: RPD [c]	**NA**	**50**	**81.48**	**66.67**	**67.15**	**NA**
611870	DP5-30-SG	30	100	370	68	899	2.20E+03 J
611870	DP5-30-SG-DUP	30	110	370	71	928	2.20E+03 J
	DP5-30-SG / SG DUP: RPD	**NA**	**9.52**	**0.0**	**4.32**	**3.17**	**0.0**
611878	DP5-50-SG	50	2.3	4.3	1.6 J	67	1.80E+03 J
611878	DP5-50-SG-DUP	50	2.6	4.4	1.7 J	70	1.80E+03 J
	DP5-50-SG / SG DUP: RPD	**NA**	**12.24**	**2.30**	**6.06**	**4.38**	**0.0**
611878	DP6-10-SG	10	31	1.2 J	4.2	111	ND
611878	DP6-10-SG-DUP	10	30	190	42	373	ND
	DP6-10-SG / SG DUP: RPD	**NA**	**3.28**	**197.49**	**163.64**	**108.26**	**NA**
611878	DP6-30-SG	30	53	310	110	670	ND
611878	DP6-30-SG-DUP	30	53	300	110	654	ND
	DP6-30-SG / SG DUP: RPD	**NA**	**0.0**	**3.28**	**0.0**	**2.42**	**NA**

[a]Analysis Request/Chain-of-Custody record.
[b]Depth below the original MWL surface grade.
[c]RPD calculated as follows: $[(X_1 - X_2)/((X_1 + X_2)/2)] \times 100$ where X_1 and X_2 are the VOC concentrations in the primary and duplicate soil-vapor samples, respectively.

CFC-12 = Dichlorodifluoromethane.
DP = Direct-push.
DUP = Duplicate.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification number.
J = Estimated concentration. See data validation report (Appendix E).
MWL = Mixed Waste Landfill.
NA = Not applicable.
ND = Not detected.
PCE = Tetracholorethene.
ppbv = Parts per billion by volume.
RPD = Relative percent difference.
SG = Soil-gas.
TCE = Trichloroethene.
VOC = Volatile organic compound.

Table 6-1
Summary of Tritium Concentrations in 1995 Boreholes BH-5 and BH-6 and 2008 Location DP6 at the Mixed Waste Landfill

Borehole	10-ft Samples (pCi/L)	30-ft Samples (pCi/L)	50-ft Samples (pCi/L)
DP6 (2008)	6.82E+03, 6.11E+03 (duplicate)	165 J, 189 J (duplicate)	NA
BH-5 (1995)	4.28E+03	ND	ND, 430 (duplicate)
BH-6 (1995)	2.43E+03	5.89E+03, 5.64E+03 (duplicate)	ND

BH = Borehole.
DP = Direct-push.
ft = Foot (feet).
J = Estimated value between the MDL and PQL, shown in parentheses.
MDL = Method detection limit.
NA = Not applicable.
ND = Not detected.
pCi/L = Picocuries per liter.
PQL = Practical quantitation limit.

Table 6-2
Summary of Tritium Concentrations in 1995 Boreholes BH-11 and BH-12 and 2008 Location DP3 at the Mixed Waste Landfill

Borehole	10-ft Samples (pCi/L)	30-ft Samples (pCi/L)	50-ft Samples (pCi/L)
DP3 (2008)	1.89E+05	8.21E+05	5.15E+03
BH-11 (1995)	7.00E+03	1.15E+03, 1.31E+03 (duplicate)	1.06E+03
BH-12 (1995)	6.70E+05	7.80E+06	2.11E+05, 2.15E+05 (duplicate)

BH = Borehole.
DP = Direct-push.
ft = Foot (feet).
pCi/L = Picocuries per liter.

Table 6-3
Summary of Mean and Maximum Concentrations of CFC-12, PCE, TCE, and Total VOCs in Soil-Vapor Samples Collected at 10 and 30 Feet (1994) and at 10, 30, and 50 Feet (2008) at the Mixed Waste Landfill

Analyte(s) and Statistical Parameter	1994 Samples	2008 Samples
CFC-12 Mean	7.15E+02	44
CFC-12 Maximum	2.90E+04	110
CFC-12 Trigger[a]	**None**	**None**
PCE Mean	426	119
PCE Maximum	5.20E+03	380
PCE Trigger[a]	**2.00E+04**	**2.00E+04**
TCE Mean	221	40
TCE Maximum	630	140
TCE Trigger[a]	**2.00E+04**	**2.00E+04**
Total VOC Mean	1.92E+03	437
Total VOC Maximum	3.07E+04	1.33E+03
Total VOCs Trigger[a]	**2.50E+04**	**2.50E+04**

[a]Vadose zone triggers for PCE, TCE, and total VOCs from the Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill (SNL/NM September 2007a).
CFC-12 = Dichlorodifluoromethane.
PCE = Tetrachloroethene.
SNL/NM = Sandia National Laboratories/New Mexico.
TCE = Trichloroethene.
VOC = Volatile organic compound.

APPENDIX A
NMED Approval Letter for the Mixed Waste Landfill Soil-Vapor Sampling and Analysis Plan

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
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RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

February 14, 2008

Patty Wagner
Manager
Sandia Site Office/NNSA
U.S. Department of Energy
P.O. Box 5400, MS 0184
Albuquerque, NM 87185-5400

Francis B. Nimick
Deputy Director
Nuclear Energy & Global Securities Technologies
Sandia National Laboratories
P.O. Box 5800, MS 0701
Albuquerque, NM 87185

RE: RESPONSE TO PUBLIC COMMENT AND APPROVAL WITH MODIFICATIONS SOIL-VAPOR SAMPLING AND ANALYSIS PLAN FOR THE U. S. DEPARTMENT OF ENERGY/SANDIA NATIONAL LABORATORIES' MIXED WASTE LANDFILL
SANDIA NATIONAL LABORATORIES, EPA ID NM5890110518
HWB-SNL-05-025

Dear Ms. Wagner and Mr. Nimick:

The Soil-Vapor Sampling and Analysis Plan (SV SAP) for the Sandia National Laboratories' (SNL's) Mixed Waste Landfill (MWL) was required by the New Mexico Environment Department (NMED) in the Notice of Disapproval (NOD) issued on November 20, 2006, for the MWL Corrective Measures Implementation Plan. The SV SAP was submitted to the NMED in December 2006 as part of SNL's response to the NOD.

Public comment was received on the SV SAP from February 5, 2007, through March 7, 2007, and from April 15, 2007, through May 15, 2007. Additionally, a public meeting on the SV SAP was held at the Los Griegos Health and Social Services Center in Albuquerque on May 1, 2007. Representatives from the U. S. Department of Energy and Sandia Corporation (Permittees) attended this meeting. A copy of NMED's response to public comment on this matter is enclosed.

Based on our review of the SV SAP, and in consideration of the public comment received NMED hereby approves the SV SAP with the following modifications:

1. Six boreholes for the collection of soil gas and soil samples shall be drilled at the locations shown on the enclosed map (at locations DP1-DP6). Two other boreholes (DP7 and DP8), planned for background locations southwest of the landfill, may be drilled at the background locations as proposed in the SV SAP.

Soil-gas and soil samples from DP1-DP8 are to be analyzed for volatile organic compounds (VOCs) and tritium, as appropriate, as described in the SV SAP. As shown on the enclosed map, the locations for DP4 and DP5 shall be the same as those shown on Figure 2-1 of the SV SAP; the rest of the boreholes, DP1-DP3 and DP6, are to be moved to different locations (see the enclosed map) because of the heterogeneous nature of waste placed into the MWL. To protect workers, the borehole locations for DP1-DP6 may be adjusted by a maximum of 20 feet in any horizontal direction to avoid drilling directly through waste buried in the MWL.

As discussed in the SV SAP, duplicate samples are to be taken from DP5 and DP6. Because the location of DP6 is to be changed, the Permittees may choose a different borehole than DP6 for the collection of the second set of duplicate samples.

The Permittees shall collect soil samples to be analyzed for tritium prior to collecting soil-gas samples in each borehole, opposite of the sequence noted in the SV SAP.

2. Soil-gas and soil samples from boreholes DP2, DP3, and DP5 shall be collected at depths of 10, 30, and a minimum of 50 feet. Samples from all other boreholes shall be collected at depths of 10 and 30 feet.

3. The radon detectors proposed in the SV SAP (track-etch type) are not the same type as those used in the 1997 radon survey for the MWL. To ensure that radon data are directly comparable with the 1997 data, the Permittees shall use the same radon detector type as those used in the 1997 survey (*i.e.*, 4-inch diameter activated-charcoal radon canisters to be analyzed for radon by gamma spectroscopy).

4. Nine radon detectors (RN1-RN9) shall be deployed at the locations shown on the enclosed map. These locations were selected, in part, based on the highest flux rates for radon as determined in the 1997 survey, and do not include the two background locations proposed in the SV SAP. The locations for RN1, RN3, RN4, RN5, RN6, RN7, and RN8 correspond to locations 30, 5, 8, 44, 13, 64, and 18 of the 1997 survey, respectively. The locations of RN2 and RN9 are new.

5. The radon data shall be submitted at the same time as the VOC and tritium data.

6. In addition to VOCs, all soil-gas samples shall be analyzed for methane.

7. The data and results of the SV SAP shall be submitted in writing to the NMED for its review and approval no later than July 31, 2008.

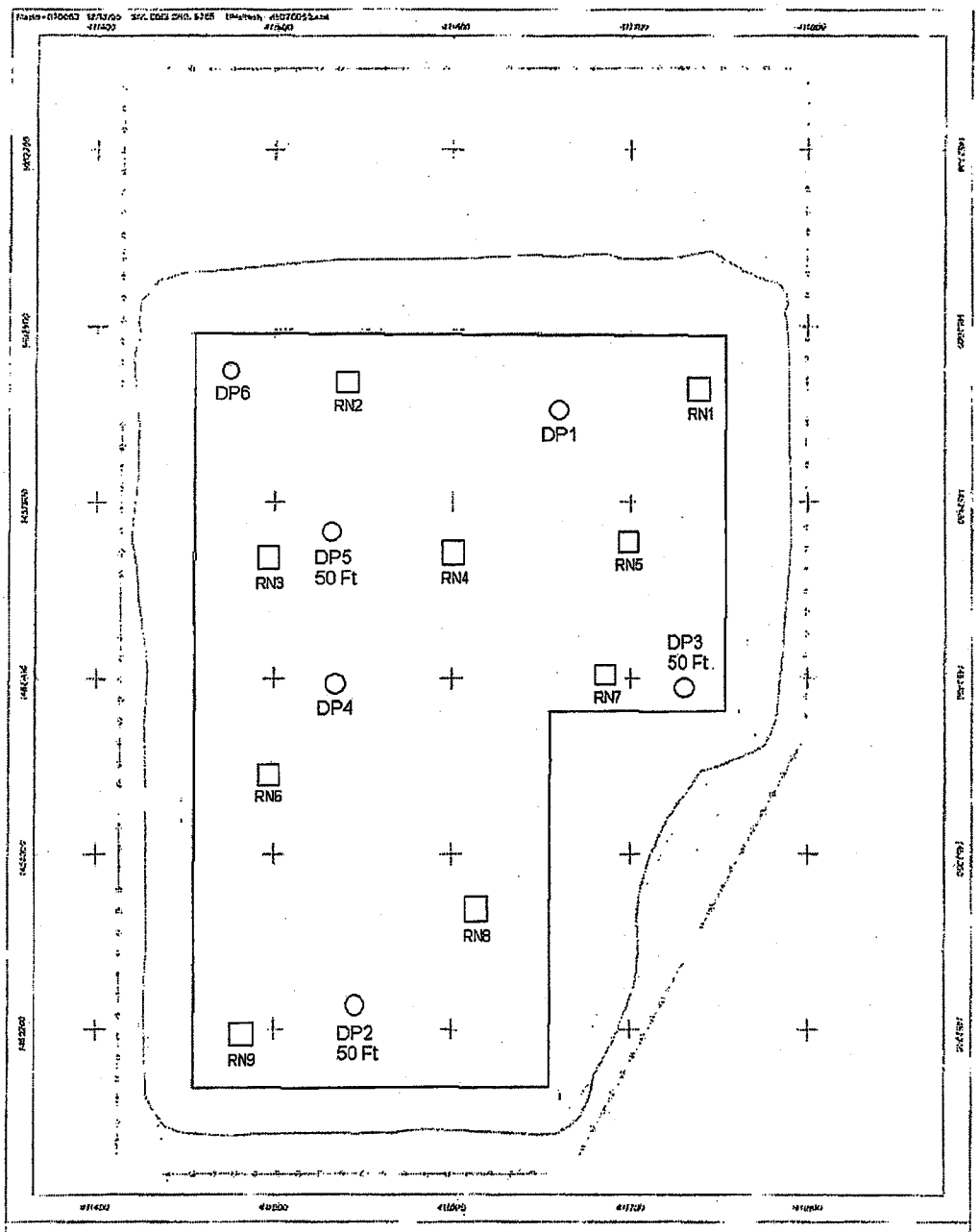
If you have any questions regarding this matter, please contact William Moats of my staff at (505) 222-9551.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

enclosures

cc: J. Kieling, NMED HWB
T. Skibitski, NMED DOE-OB
L. King, EPA-6
P. Freshour, SNL MS 1089
J. Gould, DOE, MS 0184
File: SNL 2008 and Reading
SNL-05-025



Legend

Soil Vapor and Tritium Sampling Location (DP1-DP6)

Radon Sampling Location (RN1-RN9)

Proposed Final Fence

Proposed Top of Landfill Cover

SWMU 75, Former MWL Extent

Soil Gas VOC, Tritium, and Radon Sampling Locations, Mixed Waste Landfill

0 60 120

Scale in Feet

0 14 28

Scale in Meters

APPENDIX B
Environmental Restoration Group (ERG) 2008
Radon Investigation Report for the Mixed Waste Landfill

Radon Flux Measurements for the SNL Mixed Waste Landfill

April 2008

Prepared for:

Sandia National Laboratory

Prepared by:

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113

1. Introduction

The Mixed Waste Landfill (MWL) is located approximately 5 miles southeast of Albuquerque International Sunport and 4 miles south of Sandia National Laboratories/New Mexico (SNL/NM) Technical Area (TA)-1. The landfill occupies 2.6 acres in the north-central portion of TA-3. The MWL accepted containerized and un-containerized low-level radioactive waste and minor amounts of mixed waste from SNL/NM research facilities and off-site generators from March 1959 to December 1988. Approximately 100,000 cubic feet of low-level radioactive waste (excluding packaging, containers, demolition and construction debris, and contaminated soil) containing 6300 curies (Ci) of activity (at the time of disposal) were disposed of at the MWL. The Resource Conservation and Recovery Act (RCRA) investigative process identified tritium as the primary contaminant of concern at the MWL. Tritium has been observed at the MWL since environmental studies were initiated in 1969. Tritium occurs in surface and near-surface soil in and around the classified area of the landfill.

On April 1 - 3, 2008 Environmental Restoration Group, Inc. (ERG) made radon flux measurements on the MWL. This report presents the data for these measurements.

2. Results

Fourteen (including two duplicates) flux readings were made at 12 locations on and around the landfill. Nine measurement locations were established on the MWL (MWL-RN1 through RN-9) and three background locations (MWL-RN10 through RN12) established in areas surrounding the MWL. The distribution of canisters was determined by SNL personnel. The canister locations are presented in Figure 1-1. Canisters 70 and 74 at Location MWL-RN1 and Canisters 78, 78B, and 56 at Location MWL-RN 3 are considered duplicates, with the canisters placed adjacent to one another at the same location. One trip blank, Canister 7, was included in the batch and counted with the canisters. The average flux on the MWL was 0.33 pCi/m^2s (including duplicates), which falls beneath the background mean of 0.60 pCi/m^2s. The observed flux ranges were 0.21 to 0.51 pCi/m^2s on the MWL and 0.56 to 0.65 pCi/m^2s in background. The results for the flux measurements for the MWL are presented in Table 1-1. Field and laboratory data sheets are attached in Appendix A.

3. Quality Assurance

The EPA Method 115 requirements were met for the measurements. No rainfall was reported during the 24 hours prior to the measurements. Also, the temperature exceeded 35 degrees Farenheit.

Two independent sources were used to calibrate the spectrometer, using identical geometry conditions to that of the canisters. Good agreement between calibration factors was obtained. The results of these measurements are presented in Table 1-2.

Every 10th canister was reanalyzed for comparison. The agreement between measurements is consistent with state-of-the art gamma spectroscopy results. These comparisons are presented in Table 1-3.

The measured flux of the trip blank, -0.03, is near the expected 0.00 pCi/m²s value. The trip blank result indicates that the canisters had not been exposed to radon, confirming the integrity of the bags that contained the canisters was not compromised.

As stated above, two sets of duplicates were placed on the MWL. Duplicate canisters 70 and 74 were placed at Location MWL-RN1. The radon flux results for these two canisters were 0.36 and 0.35 pCi/m²s, respectively. Duplicate canisters 78, 78B and 56 were placed at Location MWL-RN3. The radon flux results for the ~~two~~ three canisters are 0.30, 0.25, and 0.21 pCi/m²s, respectively. The agreement is better than expected since the canisters were only placed near one another, and were not true duplicates.

ERG Environmental Restoration Group, Inc.
8809 Washington St. NE Suite 150
Albuquerque, NM 87111

Table 1-1 **Radon Flux Measurements for SNL - Mixied Waste Landfill**

Canister Location	Canister Number	Lab Date	Start Count Time	Deploy Date	Deploy Time	Retrieve Date	Retrieve Time	Deployed Time (sec)	Count Time (sec)	Peak Counts	Bkg* counts	Detector Efficiency	Canister Activity(pCi	Flux pCi/m2s	Flux Error 1.00 S.D.	LLD pCi/m2s	Remarks
	BKG 1	4/2/2008	17:13	4/1/2008		04/02/08		86400	1200	2709	2706	1.11E-02	6.11E+00	0.00	0.04	0.1	OK
MWL-RN10	98	4/2/2008	17:35	4/1/2008	11:52	04/02/08	12:14	87720	1200	3957	2706	1.11E-02	2.55E+03	0.65	0.04	0.1	OK
MWL-RN1	74	4/2/2008	17:57	4/1/2008	11:24	04/02/08	11:43	87540	1200	3371	2706	1.11E-02	1.35E+03	0.35	0.04	0.1	OK
MWL-RN12	57	4/2/2008	18:18	4/1/2008	11:46	04/02/08	12:08	87720	1200	3802	2706	1.11E-02	2.23E+03	0.58	0.04	0.1	OK
MWL-RN2	15	4/2/2008	18:39	4/1/2008	11:38	04/02/08	11:55	87420	1200	3525	2706	1.11E-02	1.67E+03	0.43	0.04	0.1	OK
MWL-RN7	16	4/2/2008	19:03	4/1/2008	11:27	04/02/08	11:48	87660	1200	3673	2706	1.11E-02	1.97E+03	0.51	0.04	0.1	OK
MWL-RN11	202	4/2/2008	20:25	4/1/2008	11:42	04/02/08	12:05	87780	1200	3749	2706	1.11E-02	2.13E+03	0.56	0.04	0.1	OK
MWL-RN1	70	4/2/2008	20:46	4/1/2008	11:24	04/02/08	11:43	87540	1200	3377	2706	1.11E-02	1.37E+03	0.36	0.04	0.1	OK
MWL-RN5	95	4/2/2008	21:07	4/1/2008	11:26	04/02/08	11:47	87660	1200	3323	2706	1.11E-02	1.26E+03	0.33	0.04	0.1	OK
MWL-RN9	258	4/2/2008	21:29	4/1/2008	11:31	04/02/08	11:51	87600	1200	3341	2706	1.11E-02	1.29E+03	0.34	0.04	0.1	OK
MWL-RN8	9	4/2/2008	21:50	4/1/2008	11:30	04/02/08	11:50	87600	1200	3216	2706	1.11E-02	1.04E+03	0.28	0.04	0.1	OK
MWL-RN8	9B	4/2/2008	22:10	4/1/2008	11:30	04/02/08	11:50	87600	1200	3218	2706	1.11E-02	1.04E+03	0.28	0.04	0.1	OK
MWL-RN4	36	4/2/2008	22:31	4/1/2008	11:37	04/02/08	11:58	87660	1200	3251	2706	1.11E-02	1.11E+03	0.30	0.04	0.1	OK
MWL-RN6	37	4/3/2008	04:45	4/1/2008	11:33	04/02/08	11:53	87600	1200	3270	2706	1.11E-02	1.15E+03	0.32	0.04	0.1	OK
Trip Blank	7	4/3/2008	05:06	4/1/2008	11:24	04/02/08	12:24	90000	1200	2645	2706	1.11E-02	-1.24E+02	-0.03	0.04	0.1	OK
MWL-RN3	56	4/3/2008	05:27	4/1/2008	11:34	04/02/08	12:00	87960	1200	3072	2706	1.11E-02	7.46E+02	0.21	0.04	0.1	OK
MWL-RN3	78	4/3/2008	05:53	4/1/2008	11:34	04/02/08	12:00	87960	1200	3236	2706	1.11E-02	1.08E+03	0.30	0.04	0.1	OK
MWL-RN3	78B	4/3/2008	06:13	4/1/2008	11:34	04/02/08	12:00	87960	1200	3136	2706	1.11E-02	8.76E+02	0.25	0.04	0.1	OK
	BKG 2	4/3/2008	06:35	4/1/2008		04/02/08		86400	1200	2703	2706	1.11E-02	-6.11E+00	0.00	0.05	0.2	OK

Table 1-2 Quality Assurance Results of Standard Analysis

Standard	Date	Count Time (seconds)	Standard (nCi)	Counts	Average Bkg Counts	Efficiency	Error (1.00 SD)
STD 1A	04/02/08	1200	80	44208	2706	0.0117	6.0000E-05
STD 3	04/02/08	1200	78.83	39020	2706	0.0104	6.0000E-05
STD 1A	04/03/08	1200	80	44593	2706	0.0118	6.0000E-05
STD 3	04/03/08	1200	78.83	38980	2706	0.0103	6.0000E-05

Mean	0.0110

Table 1-3 Comparison Data of Every Tenth Sample Analyzed

Cannister	First Analysis (A) pCi/m^{2}s	Second Analysis (B) pCi/m2s	Difference
9	0.17	0.17	0.0%
78	0.19	0.13	31.6%

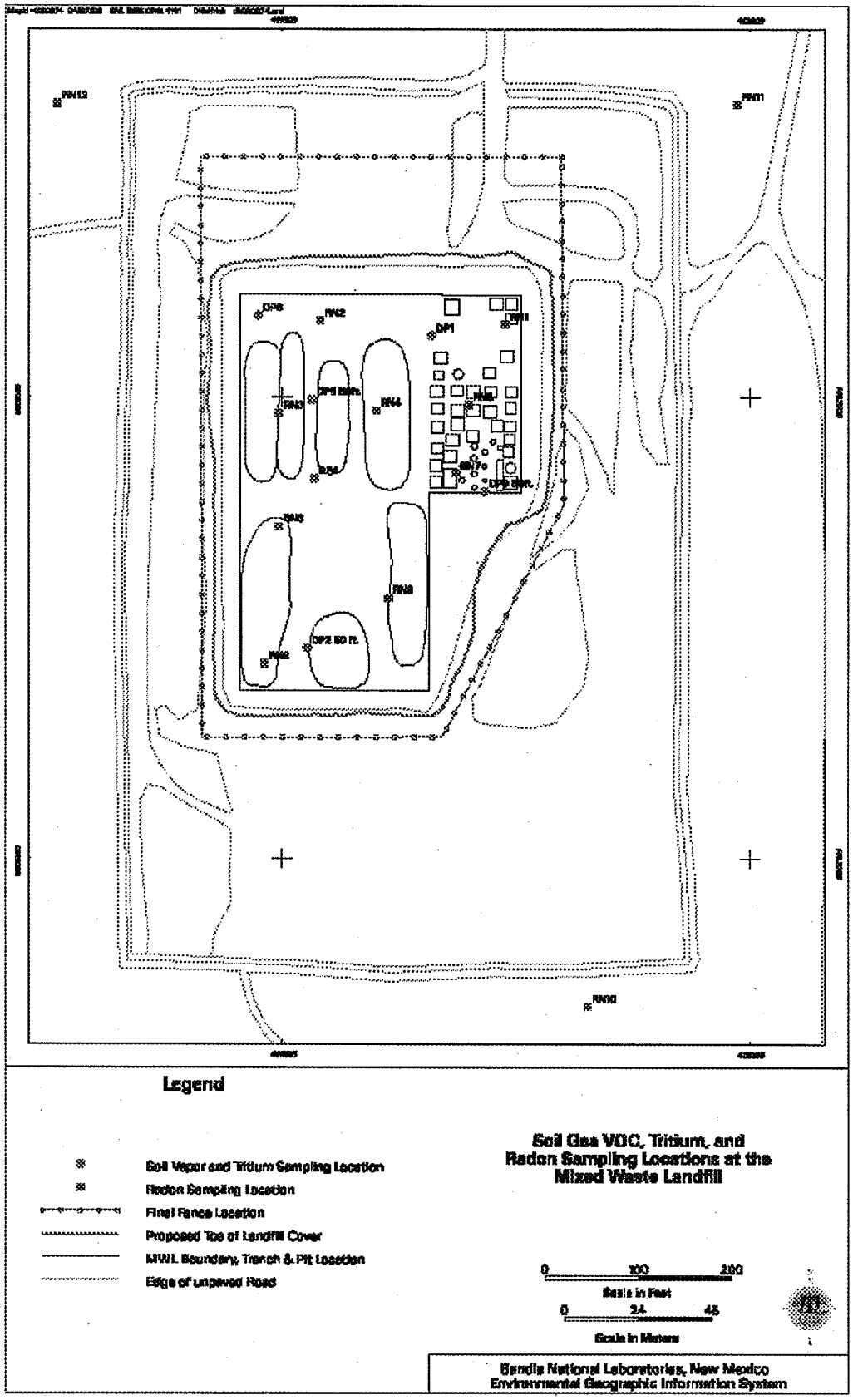


Figure 1-1. Radon Flux Canister Locations

APPENDIX C
Data Validation Reports for the 2008 Tritium Soil Samples Collected at the Mixed Waste Landfill

Cross-reference spreadsheet linking analytical laboratory SDG Numbers (shown on Analytical Quality Associates, Inc. data validation reports for the tritium soil samples) to the ER Sample ID names.

AR/COC Number	ER Sample ID	Laboratory SDG Number	Sample Matrix
Data Sorted by AR/COC Number:			
611813	MWL-DP7-10-S	206875-001	SOIL
611813	MWL-DP7-30-S	206875-002	SOIL
611813	MWL-DP8-10-S	206875-003	SOIL
611813	MWL-DP8-30-S	206875-004	SOIL
611813	MWL-EB1	206875-005	AQUEOUS
611868	MWL-DP5-10-S	208452-001	SOIL
611868	MWL-DP5-10-S-DUP	208452-004	SOIL
611868	MWL-DP5-30-S	208452-002	SOIL
611868	MWL-DP5-30-S-DUP	208452-005	SOIL
611868	MWL-DP5-50-S	208452-003	SOIL
611868	MWL-DP5-50-S-DUP	208452-006	SOIL
611868	MWL-EB2	208452-007	AQUEOUS
611868	MWL-EB3	208452-008	AQUEOUS
611872	MWL-DP3-10-S	208452-009	SOIL
611872	MWL-DP3-30-S	208452-010	SOIL
611872	MWL-DP3-50-S	208452-011	SOIL
611872	MWL-EB4	208452-012	AQUEOUS
611872	MWL-EB5	208452-013	AQUEOUS
611873	MWL-DP2-10-S	208908-001	SOIL
611873	MWL-DP2-30-S	208908-002	SOIL
611873	MWL-DP2-50-S	208908-003	SOIL
611873	MWL-EB6	208908-005	AQUEOUS
611873	MWL-EB7	208908-006	AQUEOUS
611873	MWL-EB8	208908-008	AQUEOUS
611875	MWL-DP4-10-S	208908-007	SOIL
611875	MWL-DP4-30-S	208908-008	SOIL
611875	MWL-EB9	208908-009	AQUEOUS
611877	MWL-DP6-10-S	209226-001	SOIL
611877	MWL-DP6-10-S-DUP	209226-004	SOIL
611877	MWL-DP6-30-S	209226-002	SOIL
611877	MWL-DP6-30-S-DUP	209226-005	SOIL
611877	MWL-EB10	209226-003	AQUEOUS
611877	MWL-EB11	209226-006	AQUEOUS
611879	MWL-DP1-10-S	209226-007	SOIL
611879	MWL-DP1-30-S	209226-008	SOIL
611879	MWL-EB12	209226-009	AQUEOUS
611879	MWL-EB13	209226-010	AQUEOUS

Cross-reference spreadsheet linking analytical laboratory SDG Numbers (shown on Analytical Quality Associates, Inc. data validation reports for the tritium soil samples) to the ER Sample ID names.

AR/COC Number	ER Sample ID	Laboratory SDG Number	Sample Matrix
Data Sorted by Laboratory SDG Number:			
611813	MWL-DP7-10-S	206875-001	SOIL
611813	MWL-DP7-30-S	206875-002	SOIL
611813	MWL-DP8-10-S	206875-003	SOIL
611813	MWL-DP8-30-S	206875-004	SOIL
611813	MWL-EB1	206875-005	AQUEOUS
611868	MWL-DP5-10-S	208452-001	SOIL
611868	MWL-DP5-30-S	208452-002	SOIL
611868	MWL-DP5-50-S	208452-003	SOIL
611868	MWL-DP5-10-S-DUP	208452-004	SOIL
611868	MWL-DP5-30-S-DUP	208452-005	SOIL
611868	MWL-DP5-50-S-DUP	208452-006	SOIL
611868	MWL-EB2	208452-007	AQUEOUS
611868	MWL-EB3	208452-008	AQUEOUS
611872	MWL-DP3-10-S	208452-009	SOIL
611872	MWL-DP3-30-S	208452-010	SOIL
611872	MWL-DP3-50-S	208452-011	SOIL
611872	MWL-EB4	208452-012	AQUEOUS
611872	MWL-EB5	208452-013	AQUEOUS
611873	MWL-DP2-10-S	208908-001	SOIL
611873	MWL-DP2-30-S	208908-002	SOIL
611873	MWL-DP2-50-S	208908-003	SOIL
611873	MWL-EB6	208908-005	AQUEOUS
611873	MWL-EB7	208908-006	AQUEOUS
611875	MWL-DP4-10-S	208908-007	SOIL
611875	MWL-DP4-30-S	208908-008	SOIL
611873	MWL-EB8	208908-008	AQUEOUS
611875	MWL-EB9	208908-009	AQUEOUS
611877	MWL-DP6-10-S	209226-001	SOIL
611877	MWL-DP6-30-S	209226-002	SOIL
611877	MWL-EB10	209226-003	AQUEOUS
611877	MWL-DP6-10-S-DUP	209226-004	SOIL
611877	MWL-DP6-30-S-DUP	209226-005	SOIL
611877	MWL-EB11	209226-006	AQUEOUS
611879	MWL-DP1-10-S	209226-007	SOIL
611879	MWL-DP1-30-S	209226-008	SOIL
611879	MWL-EB12	209226-009	AQUEOUS
611879	MWL-EB13	209226-010	AQUEOUS

AR/COC = Analysis Request/Chain of Custody
DP = Direct push
DUP = Duplicate
EB = Equipment blank
ER = Environmental Restoration
ID = Identification
MWL = Mixed Waste Landfill
S = Soil
SDG = Sample Data Group

Analytical Quality Associates, Inc.
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Memorandum

Date: May 21, 2008

To: File

From: David Schwent

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611813
SDG: 206875
Laboratory: GEL
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA906.0 (tritium) and ASTM D2216 (percent moisture). It should be noted that the percent moisture analysis was not evaluated for data validation. Problems were identified with the data package that result in the qualification of data.

Quantification: For samples 206875-003 and -005, the results of tritium were either < the associated 2-sigma total propagated uncertainty (TPU) or < the associated minimum detectable activity (MDA) and will be qualified "BD,FR3."

Quantification: For samples 206875-001, -002, and -004, the results of tritium were ≥ the associated MDA and <3X the MDA and will be qualified "J,FR7."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All calibration QC acceptance criteria were met.

Quantification

All quantification QC acceptance criteria were met, except as noted above in the summary section.

Blanks

No target analytes were detected in the blanks.

Tracer/Carrier Recovery

No tracer analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS QC acceptance criteria were met. No LCSD analyses were performed. The laboratory replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS QC acceptance criteria were met. No MSD analyses were performed. No sample data will be qualified as a result. It should be noted that the MS analysis for Batch 747192 was performed on a SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Replicates

All laboratory replicate QC acceptance criteria were met. It should be noted that the laboratory replicate analysis for Batch 747192 was performed on a SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. No samples required dilution.

Other QC

No field blanks (FBs) or field duplicates (FDs) were submitted on the AR/COC.

No other specific issues were identified which affect data quality.

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611813 **Radiochemistry**

Sample ID	EPA906.0 (Tritium):	10028-17-8 (tritium)
085821-001 MWL-DP7-10-S		J,FR7
085821-002 MWL-DP7-30-S		J,FR7
085822-001 MWL-DP8-10-S		BD,FR3
085822-002 MWL-DP8-30-S		J,FR7
085825-001 MWL-EB1		BD,FR3

Validated By: David Schmoll **Date:** 05/21/08

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Memorandum

Date: May 29, 2008

To: File

From: David Schwent

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611868 and 611872
SDG: 208452
Laboratory: GEL
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA906.0 (tritium) and ASTM D2216 (percent moisture). It should be noted that the percent moisture analysis was not evaluated for data validation. Problems were identified with the data package that result in the qualification of data.

Quantification: For samples 208452-007, -008, -012, and -013, the results of tritium were either < the associated 2-sigma total propagated uncertainty (TPU) or < the associated minimum detectable activity (MDA) and will be qualified "BD,FR3."

MS: In the MS analysis of Batch 755417, the QC sample concentration was >4X the spike concentration and the MS percent recovery (%R) was outside QC acceptance limits. As a result, the MS analysis was not used to evaluate the field sample data of Batch 755417. The associated results of samples 208452-001, -002, -003, -004, -005, and -006 were detects (> the MDA) and will be qualified "J,MS1" due to lack of matrix-specific accuracy information.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All calibration QC acceptance criteria were met.

Quantification

All quantification QC acceptance criteria were met, except as noted above in the summary section.

Blanks

No target analytes were detected in the blanks.

Tracer/Carrier Recovery

No tracer analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS QC acceptance criteria were met. No LCSD analyses were performed. The laboratory replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS QC acceptance criteria were met, except as noted above in the summary section. No MSD analyses were performed. No sample data will be qualified as a result.

Replicates

All laboratory replicate QC acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. No samples required dilution.

Other QC

No field blanks (FBs) were submitted on the AR/COCs. The field duplicate (FD) (samples 208452-004, -005 and -006) relative error ratios (RERs) were 3.13, 1.26, and 1.01, respectively. No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified which affect data quality.

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611868 and 611872 **Radiochemistry**

Sample ID	EPA906.0 (Tritium):	10028-17-8 (tritium)													
085819-001 MWL-DP5-10-S		J,MS1													
085819-002 MWL-DP5-30-S		J,MS1													
085819-003 MWL-DP5-50-S		J,MS1													
085823-001 MWL-DP5-10-S-DUP		J,MS1													
085823-002 MWL-DP5-30-S-DUP		J,MS1													
085823-003 MWL-DP5-50-S-DUP		J,MS1													
085826-001 MWL-EB2		BD,FR3													
085827-001 MWL-EB3		BD,FR3													
085828-001 MWL-EB4		BD,FR3													
086225-001 MWL-EB5		BD,FR3													

Validated By: David Schwartz **Date:** 05/29/08

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Memorandum

Date: June 5, 2008

To: File

From: David Schwent

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611873 and 611875
SDG: 208908
Laboratory: GEL
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods GL-RAD-A-002 (tritium), EPA906.0 (tritium), and ASTM D2216 (percent moisture). It should be noted that the percent moisture analysis was not evaluated for data validation. No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All calibration QC acceptance criteria were met.

Quantification

All quantification QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks.

Tracer/Carrier Recovery

No tracer analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS QC acceptance criteria were met. No LCSD analyses were performed. The laboratory replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS QC acceptance criteria were met. No MSD analyses were performed. No sample data will be qualified as a result.

Replicates

All laboratory replicate QC acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. No samples required dilution.

Other QC

No field blanks (FBs) or field duplicates (FDs) were submitted on the AR/COCs.

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert, Level I Peer Review, 06/06/08

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611873 and 611875 **Radiochemistry**

Sample ID	EPA906.0 (Tritium):
	All Acceptance criteria met. No sample data will be qualified.

Validated By: David Schmidt **Date:** 06/05/08

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Memorandum

Date: June 9, 2008

To: File

From: David Schwent

Subject: Radiochemical Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611877 and 611879
SDG: 209226
Laboratory: GEL
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

The samples were prepared and analyzed with accepted procedures using methods EPA906.0 (tritium) and ASTM D2216 (percent moisture). It should be noted that the percent moisture analysis was not evaluated for data validation. Problems were identified with the data package that result in the qualification of data.

Quantification: For samples 209226-002 and -005, the results of tritium were ≥ the associated minimum detectable activity (MDA) and <3X the MDA and will be qualified "J,FR7."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All calibration QC acceptance criteria were met.

Quantification

All quantification QC acceptance criteria were met, except as noted above in the summary section.

Blanks

No target analytes were detected in the blanks.

Tracer/Carrier Recovery

No tracer analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS QC acceptance criteria were met. No LCSD analyses were performed. The laboratory replicate analyses were used as measures of laboratory precision. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS QC acceptance criteria were met. No MSD analyses were performed. No sample data will be qualified as a result.

Replicates

All laboratory replicate QC acceptance criteria were met.

Detection Limits/Dilutions

All detection limits were properly reported. No samples required dilution.

Other QC

No field blanks (FBs) were submitted on the AR/COCs. All field duplicate (FD) (samples 209226-004 and -005) relative error ratios (RERs) were <1. No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified which affect data quality.

Reviewed by: Kevin A. Lambert, Level I Peer Review, 06/10/08

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611877 and 611879 **Radiochemistry**

Sample ID	EPA906.0 (Tritium):	10028-17-8 (tritium)													
085820-002 MWL-DP6-30-S		J,FR7													
085824-002 MWL-DP6-30-S-DUP		J,FR7													

Validated By: David Schwartz **Date:** 06/09/08

6.1 Data Qualifier Definitions

Data qualifiers are commonly used during the validation process to classify sample data as to their conformance to QC requirements. For the purposes of this procedure, the following code letters and associated definitions are provided:

BD	(below detection limit) - Used in radiochemistry to identify results that are not statistically different from zero.
J	The associated value is an estimated quantity.
J+	The associated numerical value is an estimated quantity with a suspected positive bias.
J-	The associated numerical value is an estimated quantity with a suspected negative bias.
N	Presumptive evidence of the presence of the material.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
NJ+	Presumptive evidence of the presence of the material at an estimated quantity with a suspected positive bias.
NJ-	Presumptive evidence of the presence of the material at an estimated quantity with a suspected negative bias.
R	The data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.
U	The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ	The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Datum is unqualified if the quality parameters indicate the method was appropriate and that the reported result reflects the true value within the expected analytical uncertainty.

9.0 REASON CODES

Programs may require that general validation codes be included in their computer databases or EDDs. The following codes are the default codes used when this is required.

H1 - Holding time exceeded for sample analysis
H2 - Holding time exceeded for sample extraction
H3 - Holding time exceeded by greater than twice the specified holding time

TP1 - Sample improperly preserved
TP2 - Sample not preserved
TP3 - Sample not maintained at required temperature
TP4 - Required sample or extract clean up not performed
TP5 - Sample received unpreserved and preserved at the laboratory

I1 - Initial calibration not reported
I2 - Initial calibration not independently verified
I3 - Slope r^2 or RF %RSD criteria not met
I4 - Minimum RF / Slope not met
I5 - Intercept too large
I6 - Insufficient number of calibration standards used

C1 - Continuing calibration frequency not met
C2 - Continuing calibration %D failed high
C3 - Continuing calibration %D failed low

B - Method blank contamination at concentration greater than PQL
B1 - Trip blank contamination at concentration greater than PQL
B2 - Field/equipment blank contamination at concentration greater than PQL
B3 - Calibration blank contamination at concentration greater than PQL
B4 - Negative value for calibration blank - absolute value greater than the MDL
B5 - Negative value for method blank - absolute value greater than the MDL
B6 - Negative value for field/equipment/trip blank - absolute value greater than the MDL
B7 - Method blank contamination at activity greater than the MDA
B8 - Method blank frequency not met
B9 - Instrument or calibration blank frequency not met

IS1 - Internal standard / tracer recovery failed high
IS2 - Internal standard / tracer recovery failed low but greater than 10%
IS3 - Internal standard / tracer recovery failed low and less than 10%

S1 - Surrogate(s) failed high
S2 - Surrogate(s) failed low
S3 - Multiple random surrogate failures

FR1 - Result exceeds calibration range
FR2 - No result reported - sample lost or damaged
FR3 - Result is less than the MDA / MDL
FR4 - Negative result - absolute value greater than the MDA/MDL
FR5 - Retention time criteria not met
FR6 - Ion mass ratio criteria not met

MS1 - Matrix spike not analyzed or not analyzed on the client's sample
MS2 - Matrix spike analyte(s) recovery failed high
MS3 - Matrix spike analyte(s) recovery failed low
MS4 - Matrix spike analyte(s) recovery failed both high and low
MS5 - MS/MSD relative percent difference failed

RP1 - Replicate not analyzed or not analyzed on the client's sample
RP2 - Replicate relative percent difference failed

L1 - Laboratory control sample frequency not met
L2 - Laboratory control sample analyte(s) recovery failed high
L3 - Laboratory control sample analyte(s) recovery failed low
L4 - Laboratory control sample analyte(s) recovery failed both high and low
L5 - LCS/LCSD relative percent difference failed

DL1 - Reporting limit verification frequency not met
DL2 - Reporting limit verification percent recovery failed high
DL3 - Reporting limit verification percent recovery failed low

CK1 - Interference check sample frequency not met
CK2 - Interference check sample analyte(s) failed high
CK3 - Interference check sample analyte(s) failed low

D1 - Serial dilution failed percent recovery
D2 - Inappropriate initial dilution

V1 - Conformation analysis not done
V2 - Conformation RPD exceeds criteria

X1 - General data quality is suspect - see report
X2 - Analysis failed to meet method requirements - see report
X3 - Required QC documentation missing

APPENDIX D
Analytical Reports for the 2008 Soil-Vapor Samples Collected at the Mixed Waste Landfill

CLEAN

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No.

SMO Use LRE0228

AR/COC 611880

Dept. No./Mail Stop:	6765/MS1089	Date Samples Shipped:	5-27-08	Project/Task No.:	98045/02.02.02
Project/Task Manager:	P. Freshour	Carrier/Waybill No.	40128	SMO Authorization:	SMO
Project Name:	MWL Remediation	Lab Contact:	MTRUPTI MISTRY	Contract #:	PO691437
Record Center Code:		Lab Destination:	Test America CA SANTA ANA		
Logbook Ref. No.:		SMO Contact/Phone:	P. Puisant/505-844-3185		
Service Order No.	CF013-08	Send Report to SMO:	Rita Kavanaugh 284-2553		
Location	Tech Area				
Building	Room				

SEE BOTTLE ORDER

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☐ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
085805-001	MWL-DP1-10-SG	N/A	MWL	0749 / 5-27-08	SG	SC	6L	NONE	G	SA	TO-14 + Methane	
085805-002	MWL-DP1-30-SG	N/A	MWL	0828 / "	SG	SC	6L	NONE	G	SA	TO-14 + Methane	

RMMA	☑ Yes ☐ No Ref. No.	**Sample Tracking**	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	30 day ~~Normal~~ ☑ Rush	Entered by:	
Return Samples By:	Level of Rush: 1 DAY TAT	QC inits.	

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
***Send report to:**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	Weston/4133/505-844-1013
	Bill Gibson	William Gibson	WG	Weston/4133/505-284-5232

***Please list as separate report.**

1.Relinquished by William Gibson	Org. 4133	Date 5-27-08	Time 0845	4.Relinquished by	Org.	Date	Time
1. Received by SMO	Org. 4133	Date 5-27-08	Time 0845	4. Received by	Org.	Date	Time
2.Relinquished by SMO	Org. 4133	Date 5-27-08	Time 1030	5.Relinquished by	Org.	Date	Time
2. Received by	Org.	Date 5/28/08	Time 1000	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0228
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/28/08 10:00
Reported: 06/02/08 15:31

ANALYTICAL REPORT

Sample ID: LRE0228-01 (085805-001/MWL-DP1-10-SG - Air) **Sampled: 05/27/08 07:49**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**55**		ppbv	2.5	10	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Benzene	**17**		ppbv	1.5	3.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Bromoform	ND		ppbv	0.50	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
2-Butanone (MEK)	**13**		ppbv	2.0	10	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Chloroform	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Dichlorodifluoromethane	**39**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,1-Dichloroethene	**1.4**	J	ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Ethylbenzene	**3.2**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
4-Ethyltoluene	**2.8**		ppbv	0.70	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
2-Hexanone	ND		ppbv	2.0	10	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Methylene chloride	**0.90**	J	ppbv	0.80	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Styrene	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Tetrachloroethene	**15**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Toluene	**26**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,1,1-Trichloroethane	**1.6**	J	ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Trichloroethene	**14**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

Sandia National Laboratories	Work Order:	LRE0228	Received:	05/28/08 10:00
Payment Processing, MS 1385 P.O. Box 5130			Reported:	06/02/08 15:31
Albuquerque, NM 87185-0154	Project:	MWL Remediation		
Rita Kavanaugh	Project Number:	98045/02.02.02/CF013-08		

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0228-01 (085805-001/MWL-DP1-10-SG - Air) - cont.						**Sampled: 05/27/08 07:49**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**16**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,1,2-Trichloro-1,2,2-trifluoroethane	**8.0**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,2,4-Trimethylbenzene	**4.4**		ppbv	1.3	3.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
1,3,5-Trimethylbenzene	**2.3**	J	ppbv	1.1	3.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/30/08 00:14	gcmsa	AA	8E30003
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
m,p-Xylene	**16**		ppbv	2.0	4.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003
o-Xylene	**4.2**		ppbv	1.0	2.0	1.0	05/30/08 00:14	gcmsa	AA	8E30003

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0228 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/28/08 10:00 06/02/08 15:31

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0228-01 (085805-001/MWL-DP1-10-SG - Air)							**Sampled: 05/27/08 07:49**			
ASTM D1946 - Fixed Gases										
Methane	**0.00043**	J	%(v/v)	0.00013	0.00044	2.2	05/29/08 17:20	GC8-Rear	EI	8E29006

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0228
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/28/08 10:00
Reported: 06/02/08 15:31

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0228-02 (085805-002/MWL-DP1-30-SG - Air)						**Sampled: 05/27/08 08:28**				
EPA TO14A - Volatile Organic Compounds by GC/MS										
Acetone	**6.0**	J	ppbv	2.5	10	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Benzene	ND		ppbv	1.5	3.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Bromoform	ND		ppbv	0.50	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
2-Butanone (MEK)	ND		ppbv	2.0	10	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Chloroform	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Dichlorodifluoromethane	**6.8**		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,1-Dichloroethene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
2-Hexanone	ND		ppbv	2.0	10	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Methylene chloride	**1.0**	J	ppbv	0.80	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Styrene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Tetrachloroethene	**1.8**	J	ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Toluene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,1,1-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Trichloroethene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003

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THE LEADER IN ENVIRONMENTAL TESTING
1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0228 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/28/08 10:00 06/02/08 15:31	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0228-02 (085805-002/MWL-DP1-30-SG - Air) - cont.						**Sampled: 05/27/08 08:28**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**2.9**		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,1,2-Trichloro-1,2,2-trifluoroethane	**1.2**	J	ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/30/08 01:00	gcmsa	AA	8E30003
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/30/08 01:00	gcmsa	AA	8E30003

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0228 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/28/08 10:00 06/02/08 15:31

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0228-02 (085805-002/MWL-DP1-30-SG - Air)							**Sampled: 05/27/08 08:28**			
ASTM D1946 - Fixed Gases										
Methane	0.00019	J	%(v/v)	0.00016	0.00053	2.6	05/29/08 17:39	GC8-Rear	EI	8E29006

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. NA

SMO Use LRE0191

Page 1 of 1

AR/COC 611874

Dept. No./Mail Stop:	6765/MS1089	Date Samples Shipped:	5-21-08	Project/Task No.:	98045/02.02.02
Project/Task Manager:	P. Freshour	Carrier/Waybill No.	89638	SMO Authorization:	
Project Name:	MWL Remediation	Lab Contact:	TRUPTI MISTRY	Contract #:	PO691437
Record Center Code:		Lab Destination:	Test America CA SANTA ANA		
Logbook Ref. No.:		SMO Contact/Phone:	P. Puisant/505-844-3185		
Service Order No.	CF013-08	Send Report to SMO:	Rita Kavanaugh 284-2553		
Location	Tech Area				
Building	Room				

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☐ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
085806-001	MWL-DP2-10-SG	N/A	MWL	5/16/08 1453	SG	SC	6L	NONE	G	SA	TO-14	
085806-002	MWL-DP2-30-SG	N/A	MWL	5/16/08 1519	SG	SC	6L	NONE	G	SA	TO-14	
085806-003	MWL-DP2-50-SG	N/A	MWL	5/16/08 1554	SG	SC	6L	NONE	G	SA	TO-14	

RMMA ☑ Yes ☐ No Ref. No.
Sample Disposal ☐ Return to Client ☑ Disposal by lab
Turnaround Time 30 day ☑ Normal ☐ Rush
Return Samples By: Level of Rush: QC Inits.

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4133/505-844-1013
	Bill Gibson		WJG	Weston/4133/505-284-5232

*Please list as separate report.

1.Relinquished by		Org. 4133	Date 5/21/08	Time 0830	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4133	Date 5/21/08	Time 0830	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4133	Date 5/21/08	Time 1100	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date 5/22/08	Time 1005	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

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1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0191
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/22/08 10:00
Reported: 05/28/08 16:16

ANALYTICAL REPORT

Sample ID: LRE0191-01 (085806-001/MWL-DP2-10-SG - Air) **Sampled: 05/16/08 14:53**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**8.5**	J	ppbv	2.5	10	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Benzene	ND		ppbv	1.5	3.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
2-Butanone (MEK)	**3.3**	J	ppbv	2.0	10	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Chloroform	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Dichlorodifluoromethane	**20**		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
cis-1,2-Dichloroethene	**6.9**		ppbv	0.80	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,1-Dichloroethene	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Methylene chloride	ND		ppbv	0.80	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Styrene	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Tetrachloroethene	**12**		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Toluene	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,1,1-Trichloroethane	**25**		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Trichloroethene	**11**		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005

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1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0191 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/22/08 10:00 05/28/08 16:16

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0191-01 (085806-001/MWL-DP2-10-SG - Air) - cont.						**Sampled: 05/16/08 14:53**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**16**		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,1,2-Trichloro-1,2,2-trifluoroethane	**20**		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/22/08 22:26	gcmsa	AD	8E23005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/22/08 22:26	gcmsa	AD	8E23005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0191 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/22/08 10:00 05/28/08 16:16

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0191-01 (085806-001/MWL-DP2-10-SG - Air)						**Sampled: 05/16/08 14:53**				
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00017	0.00056	2.8	05/23/08 12:05	GC8	EI	8E27004

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0191
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/22/08 10:00
Reported: 05/28/08 16:16

ANALYTICAL REPORT

Sample ID: LRE0191-02 (085806-002/MWL-DP2-30-SG - Air) **Sampled: 05/16/08 15:19**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**31**		ppbv	2.5	10	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Benzene	**1.7**	J	ppbv	1.5	3.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
2-Butanone (MEK)	**7.7**	J	ppbv	2.0	10	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Chloroform	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Dichlorodifluoromethane	**51**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,1-Dichloroethene	**4.2**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Methylene chloride	**0.85**	J	ppbv	0.80	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Styrene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Tetrachloroethene	**40**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Toluene	**2.5**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,1,1-Trichloroethane	**40**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Trichloroethene	**30**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0191
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/22/08 10:00
Reported: 05/28/08 16:16

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0191-02 (085806-002/MWL-DP2-30-SG - Air) - cont.						**Sampled: 05/16/08 15:19**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**35**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,1,2-Trichloro-1,2,2-trifluoroethane	**51**		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/22/08 23:07	gcmsa	AD	8E23005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:07	gcmsa	AD	8E23005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0191 Project: MWL Remediation Project Number: 98045/02.02.02/CF013-08	Received: 05/22/08 10:00 Reported: 05/28/08 16:16	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0191-02 (085806-002/MWL-DP2-30-SG - Air)						**Sampled: 05/16/08 15:19**				
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00017	0.00055	2.8	05/23/08 12:18	GC8	EI	8E27004

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0191
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/22/08 10:00
Reported: 05/28/08 16:16

ANALYTICAL REPORT

Sample ID: LRE0191-03 (085806-003/MWL-DP2-50-SG - Air) **Sampled: 05/16/08 15:54**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**29**		ppbv	2.5	10	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Benzene	ND		ppbv	1.5	3.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
2-Butanone (MEK)	**7.5**	J	ppbv	2.0	10	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Chloroform	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Dichlorodifluoromethane	**19**		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,1-Dichloroethene	**2.0**		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Methylene chloride	**0.82**	J	ppbv	0.80	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Styrene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Tetrachloroethene	**14**		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Toluene	**1.2**	J	ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,1,1-Trichloroethane	**9.5**		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Trichloroethene	**13**		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0191 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/22/08 10:00 05/28/08 16:16

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0191-03 (085806-003/MWL-DP2-50-SG - Air) - cont.						**Sampled: 05/16/08 15:54**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**11**		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,1,2-Trichloro-1,2,2-trifluoroethane	**19**		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/22/08 23:50	gcmsa	AD	8E23005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/22/08 23:50	gcmsa	AD	8E23005

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Sandia National Laboratories	Work Order:	LRE0191	Received:	05/22/08 10:00
Payment Processing, MS 1385 P.O. Box 5130			Reported:	05/28/08 16:16
Albuquerque, NM 87185-0154	Project:	MWL Remediation		
Rita Kavanaugh	Project Number:	98045/02.02.02/CF013-08		

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0191-03 (085806-003/MWL-DP2-50-SG - Air)							**Sampled: 05/16/08 15:54**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00017	0.00057	2.8	05/23/08 12:32	GC8	EI	8E27004

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. LRE0138 SMO Use

AR/COC 611871

Dept. No./Mail Stop:	4133 MS1042	Date Samples Shipped:	5-15-08	Project/Task No.:	98445/02.02.02
Project/Task Manager:	P. Freshour	Carrier/Waybill No.	89747	SMO Authorization:	RB SMO
Project Name:	MWL Remediation	Lab Contact:	Sonia Tabirara/714-258-8610	Contract #:	PO691437
Record Center Code:		Lab Destination:	Test America - CA		
Logbook Ref. No.:		SMO Contact/Phone:	P. Puisant/505-844-3185		
Service Order No.	CF013-08	Send Report to SMO:	Rita Kavanaugh 284-2553		
Location	Tech Area				
Building	Room				

☐ **Waste Characterization**
-Send preliminary/copy report to:

☐ **Released by COC No.:**
☐ **Validation Required**

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
085807-001	MWL-DP3-10-SG	N/A	MWL	5/13/08 10:44	SG	SC	6L	NONE	G	SA	TO-14	
085807-002	MWL-DP3-30-SG	N/A	MWL	5/13/08 11:08	SG	SC	6L	NONE	G	SA	TO-14	
085807-003	MWL-DP3-50-SG	N/A	MWL	5/14/08 10:25	SG	SC	6L	NONE	G	SA	TO-14	

RMMA ☐ Yes ☐ No Ref. No.
Sample Disposal ☐ Return to Client ☑ Disposal by lab
Turnaround Time 30 day ☐ Normal ☐ Rush
Return Samples By: Level of Rush: QC inits.

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
***Send report to:**

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4133/844-1013
	Danielle Nieto		DN	Sandia/4133/505-845-7706

1. Relinquished by	Org. 4133	Date 5/15/08	Time 0700	4. Relinquished by	Org.	Date	Time
1. Received by	Org. 4133	Date 5-15-08	Time 0700	4. Received by	Org.	Date	Time
2. Relinquished by	Org. 4133	Date 5-15-08	Time 100	5. Relinquished by	Org.	Date	Time
2. Received by	Org.	Date 5/16/08	Time 1945	5. Received by	Org.	Date	Time
3. Relinquished by	Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0138
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/16/08 09:45
Reported: 05/27/08 18:58

ANALYTICAL REPORT

Sample ID: LRE0138-01 (085807-001/MWL-DP3-10-SG - Air) **Sampled: 05/13/08 10:44**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**47**		ppbv	2.5	10	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Benzene	ND		ppbv	1.5	3.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Bromoform	ND		ppbv	0.50	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
2-Butanone (MEK)	**29**		ppbv	2.0	10	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Chloroform	**3.1**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Dichlorodifluoromethane	**55**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,1-Dichloroethane	**2.2**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,1-Dichloroethene	**3.8**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,2-Dichloro-1,1,2,2-tetrafluoroethane	**1.6**	J	ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Ethylbenzene	**1.6**	J	ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
4-Ethyltoluene	**17**		ppbv	0.70	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
2-Hexanone	ND		ppbv	2.0	10	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Methylene chloride	ND		ppbv	0.80	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
4-Methyl-2-pentanone (MIBK)	**8.2**	J	ppbv	2.0	10	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Styrene	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Tetrachloroethene	**53**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Toluene	**7.0**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,1,1-Trichloroethane	**79**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Trichloroethene	**39**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0138 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/16/08 09:45 05/27/08 18:58	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0138-01 (085807-001/MWL-DP3-10-SG - Air) - cont.						**Sampled: 05/13/08 10:44**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
1,1,2-Trichloro-1,2,2-trifluoroethane	**45**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,2,4-Trimethylbenzene	**14**		ppbv	1.3	3.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
1,3,5-Trimethylbenzene	**14**		ppbv	1.1	3.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/17/08 19:11	gcmsb	AD	8E20001
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
m,p-Xylene	**4.9**		ppbv	2.0	4.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001
o-Xylene	**3.2**		ppbv	1.0	2.0	1.0	05/17/08 19:11	gcmsb	AD	8E20001

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ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0138-01 (085807-001/MWL-DP3-10-SG - Air)							**Sampled: 05/13/08 10:44**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00019	0.00063	3.2	05/20/08 10:25	GC8	EI	8E21003

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Rita Kavanaugh

Work Order: LRE0138
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/16/08 09:45
Reported: 05/27/08 18:58

ANALYTICAL REPORT

Sample ID: LRE0138-02 (085807-002/MWL-DP3-30-SG - Air) **Sampled: 05/13/08 11:08**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**24**		ppbv	2.5	10	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Benzene	ND		ppbv	1.5	3.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Bromoform	ND		ppbv	0.50	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
2-Butanone (MEK)	**8.2**	J	ppbv	2.0	10	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Chloroform	**6.2**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Chloromethane	**1.0**	J	ppbv	1.0	4.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Dichlorodifluoromethane	**100**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,1-Dichloroethane	**6.7**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
cis-1,2-Dichloroethene	**2.0**	J	ppbv	0.80	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,1-Dichloroethene	**19**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,2-Dichloro-1,1,2,2-tetrafluoroethane	**1.8**	J	ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
4-Ethyltoluene	**1.3**	J	ppbv	0.70	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
2-Hexanone	ND		ppbv	2.0	10	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Methylene chloride	**1.4**	J	ppbv	0.80	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Styrene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Tetrachloroethene	**100**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Toluene	**1.7**	J	ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,1,1-Trichloroethane	**110**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Trichloroethene	**110**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0138 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/16/08 09:45 05/27/08 18:58	

ANALYTICAL REPORT

Sample ID: LRE0138-02 (085807-002/MWL-DP3-30-SG - Air) - cont. **Sampled: 05/13/08 11:08**

EPA TO14A - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Trichlorofluoromethane	**360**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Trichlorofluoromethane	**310**		ppbv	6.9	14	6.9	05/19/08 13:47	gcmsb	DLK	8E21009
1,1,2-Trichloro-1,2,2-trifluoroethane	**100**		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,2,4-Trimethylbenzene	**1.8**	J	ppbv	1.3	3.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
1,3,5-Trimethylbenzene	**1.4**	J	ppbv	1.1	3.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/17/08 20:02	gcmsb	AD	8E20001
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:02	gcmsb	AD	8E20001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0138 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/16/08 09:45 05/27/08 18:58

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0138-02 (085807-002/MWL-DP3-30-SG - Air)						**Sampled: 05/13/08 11:08**				
ASTM D1946 - Fixed Gases										
Methane	**0.022**		%(v/v)	0.00019	0.00062	3.1	05/20/08 10:41	GC8	EI	8E21003

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Rita Kavanaugh

Work Order: LRE0138
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/16/08 09:45
Reported: 05/27/08 18:58

ANALYTICAL REPORT

Sample ID: LRE0138-03 (085807-003/MWL-DP3-50-SG - Air) **Sampled: 05/14/08 10:25**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**190**		ppbv	2.5	10	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Benzene	ND		ppbv	1.5	3.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Bromoform	ND		ppbv	0.50	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
2-Butanone (MEK)	**77**		ppbv	2.0	10	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Chloroform	**6.7**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Dichlorodifluoromethane	**110**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,1-Dichloroethane	**8.9**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
cis-1,2-Dichloroethene	**3.0**		ppbv	0.80	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,1-Dichloroethene	**25**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Ethylbenzene	**1.2**	J	ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
4-Ethyltoluene	**3.3**		ppbv	0.70	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
2-Hexanone	ND		ppbv	2.0	10	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Methylene chloride	**1.7**	J	ppbv	0.80	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
4-Methyl-2-pentanone (MIBK)	**7.9**	J	ppbv	2.0	10	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Styrene	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Tetrachloroethene	**120**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Toluene	**3.3**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,1,1-Trichloroethane	**120**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Trichloroethene	**140**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0138 Project: MWL Remediation Project Number: 98045 02.02.02 / CF013-08	Received: 05/16/08 09:45 Reported: 05/27/08 18:58	

ANALYTICAL REPORT

Sample ID: LRE0138-03 (085807-003/MWL-DP3-50-SG - Air) - cont. **Sampled: 05/14/08 10:25**

EPA TO14A - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Trichlorofluoromethane	**390**		ppbv	6.4	13	6.4	05/19/08 14:24	gcmsb	DLK	8E21009
1,1,2-Trichloro-1,2,2-trifluoroethane	**110**		ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,2,4-Trimethylbenzene	**6.1**		ppbv	1.3	3.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
1,3,5-Trimethylbenzene	**2.7**	J	ppbv	1.1	3.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/17/08 20:47	gcmsb	AD	8E20001
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
m,p-Xylene	**4.3**		ppbv	2.0	4.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001
o-Xylene	**2.0**	J	ppbv	1.0	2.0	1.0	05/17/08 20:47	gcmsb	AD	8E20001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0138 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/16/08 09:45 05/27/08 18:58	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0138-03 (085807-003/MWL-DP3-50-SG - Air)							**Sampled: 05/14/08 10:25**			
ASTM D1946 - Fixed Gases										
Methane	0.54		%(v/v)	0.00015	0.00051	2.6	05/20/08 10:55	GC8	EI	8E21003

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page _1_ of _1_

Batch No. WRE0192 SMO Use

AR/COC 611876

Dept. No./Mail Stop:	6765/MS1089	Date Samples Shipped:	5-21-08	Project/Task No.:	98045/02.02.02
Project/Task Manager:	P. Freshour	Carrier/Waybill No.	89 038	SMO Authorization:	
Project Name:	MWL Remediation	Lab Contact:	TRUPTI MISTRY	Contract #:	PO691437
Record Center Code:		Lab Destination:	Test America CA, SANTA ANA		
Logbook Ref. No.:		SMO Contact/Phone:	P. Puisant/505-844-3185		
Service Order No.	CF013-08	Send Report to SMO:	Rita Kavanaugh 284-2553		
Location	Tech Area				
Building	Room				

☐ **Waste Characterization**
-Send preliminary/copy report to:

☐ **Released by COC No.:**
☐ **Validation Required**

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
085808-001	MWL-DP4-10-SG	N/A	MWL	5/19/08 1538	SG	SC	6L	NONE	G	SA	TO-14	
085808-002	MWL-DP4-30-SG	N/A	MWL	5/19/08 1614	SG	SC	6L	NONE	G	SA	TO-14	

RMMA ☑ Yes ☐ No Ref. No.
Sample Disposal ☐ Return to Client ☑ Disposal by lab
Turnaround Time 30 day ☑ Normal ☐ Rush
Return Samples By: Level of Rush: QC inits.

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
***Send report to:**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	Weston/4133/505-844-1013
	Bill Gibson			Weston/4133/505-284-5232

Please list as separate report.

1.Relinquished by		Org. 4133	Date 5/21/08	Time 0830	4.Relinquished by	Org.	Date	Time
1. Received by		Org. 4133	Date 5/21/08	Time 0830	4. Received by	Org.	Date	Time
2.Relinquished by		Org. 4133	Date 5/21/08	Time 1100	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	Date 5/21/08	Time 1100	5. Received by	Org.	Date	Time
3.Relinquished by		Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by	Org.	Date	Time

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0192
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/22/08 10:00
Reported: 05/28/08 16:36

ANALYTICAL REPORT

Sample ID: LRE0192-01 (085808-001/MWL-DP4-10-SG - Air) **Sampled: 05/19/08 15:38**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**20**		ppbv	2.5	10	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Benzene	ND		ppbv	1.5	3.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
2-Butanone (MEK)	**7.5**	J	ppbv	2.0	10	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Carbon disulfide	**3.1**	J	ppbv	2.0	10	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Chloroform	**1.0**	J	ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Dichlorodifluoromethane	**70**		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,1-Dichloroethene	**2.9**		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Methylene chloride	**0.95**	J	ppbv	0.80	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Styrene	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Tetrachloroethene	**120**		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Toluene	**1.8**	J	ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,1,1-Trichloroethane	**32**		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Trichloroethene	**34**		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0192 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/22/08 10:00 05/28/08 16:36

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0192-01 (085808-001/MWL-DP4-10-SG - Air) - cont.						**Sampled: 05/19/08 15:38**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**83**		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,1,2-Trichloro-1,2,2-trifluoroethane	**71**		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/23/08 00:34	gcmsa	AD	8E23005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/23/08 00:34	gcmsa	AD	8E23005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0192 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/22/08 10:00 05/28/08 16:36	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0192-01 (085808-001/MWL-DP4-10-SG - Air)							**Sampled: 05/19/08 15:38**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00019	0.00062	3.1	05/23/08 17:01	GC8	EI	8E27004

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Sandia National Laboratories
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Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0192
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/22/08 10:00
Reported: 05/28/08 16:36

ANALYTICAL REPORT

Sample ID: LRE0192-02 (085808-002/MWL-DP4-30-SG - Air) **Sampled: 05/19/08 16:14**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**84**		ppbv	2.5	10	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Benzene	**19**		ppbv	1.5	3.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
2-Butanone (MEK)	**21**		ppbv	2.0	10	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Chloroform	**2.5**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Dichlorodifluoromethane	**110**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,1-Dichloroethane	**2.9**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
cis-1,2-Dichloroethene	**2.0**	J	ppbv	0.80	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,1-Dichloroethene	**11**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Ethylbenzene	**1.9**	J	ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
4-Ethyltoluene	**1.7**	J	ppbv	0.70	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Methylene chloride	**1.4**	J	ppbv	0.80	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Styrene	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Tetrachloroethene	**190**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Toluene	**22**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,1,1-Trichloroethane	**46**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Trichloroethene	**100**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0192 MWL Remediation 98045/02.02.02/CF013-08	Received: 05/22/08 10:00 Reported: 05/28/08 16:36

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0192-02 (085808-002/MWL-DP4-30-SG - Air) - cont.							**Sampled: 05/19/08 16:14**			
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**140**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,1,2-Trichloro-1,2,2-trifluoroethane	**120**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,2,4-Trimethylbenzene	**2.3**	J	ppbv	1.3	3.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
1,3,5-Trimethylbenzene	**1.4**	J	ppbv	1.1	3.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/23/08 01:17	gcmsa	AD	8E23005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
m,p-Xylene	**11**		ppbv	2.0	4.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005
o-Xylene	**2.5**		ppbv	1.0	2.0	1.0	05/23/08 01:17	gcmsa	AD	8E23005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0192 MWL Remediation 98045/02.02.02/CF013-08	Received: 05/22/08 10:00 Reported: 05/28/08 16:36

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0192-02 (085808-002/MWL-DP4-30-SG - Air)							**Sampled: 05/19/08 16:14**			
ASTM D1946 - Fixed Gases										
Methane	**0.00046**	J	%(v/v)	0.00017	0.00056	2.8	05/23/08 17:14	GC8	EI	8E27004

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 2

Internal Lab

Batch No. N/A

SMO Use LRE0127

AR/COC 611870

Dept. No./Mail Stop:	4133/MS-1042	Date Samples Shipped:	5-12-08	Project/Task No.:	98045 02.02.02.
Project/Task Manager:		Carrier/Waybill No.	89633	SMO Authorization:	[illegible] SMO
Project Name:		Lab Contact:	Sonia Tabirara/714-258-8610	Contract #:	TEST AMERICA PO691437
Record Center Code:	ER/1345/DAT	Lab Destination:	Test America SANTA ANA CA.		
Logbook Ref. No.:	003	SMO Contact/Phone:	P. Pulsant/505-844-3185		see bottle order
Service Order No.	CF029-08	Send Report to SMO:	Rita Kavanaugh 284-2553		
Location	Tech Area				
Building	Room				

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☐ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested		Lab Sample ID
085809-001	MWL-DP5-10-SG	N/A	MWL	5/8/08 14:30	SG	SC	6L	NONE	G	SA	TO-14		
085809-002	MWL-DP5-30-SG	N/A	MWL	5/9/08 09:00	SG	SC	6L	NONE	G	SA	TO-14		
085809-003	MWL-DP5-50-SG	N/A	MWL	5/9/08 09:37	SG	SC	6L	NONE	G	SA	TO-14		
085813-001	MWL-DP5-10-SG-DUP	N/A	MWL	5/9/08 10:16	SG	SC	6L	NONE	G	SA	TO-14		
085813-002	MWL-DP5-30-SG-DUP	N/A	MWL	5/9/08 09:02	SG	SC	6L	NONE	G	SA	TO-14		
085813-003	MWL-DP5-50-SG-DUP	N/A	MWL	5/9/08 09:39	SG	SC	6L	NONE	G	SA	TO-14		

RMMA ☐ Yes ☑ No Ref. No.
Sample Disposal ☐ Return to Client ☑ Disposal by lab
Turnaround Time 30 day ☑ ~~Normal~~ ☒ Rush
Return Samples By: Level of Rush: 15 DAY

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:
QC inits.

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	[signature]	RL	?/4133/844-1013
	Danielle Nieto	[signature]	DN	Sandia/4133/505-845-7706

*Please list as separate report.

1. Relinquished by [signature]	Org. 4133	Date 5/12/08	Time 1145	4. Relinquished by	Org.	Date	Time
1. Received by [signature] SMO	Org. 4133	Date 5/12/08	Time 1145	4. Received by	Org.	Date	Time
2. Relinquished by [signature] SMO	Org. 4133	Date 5/12/08	Time 1238	5. Relinquished by	Org.	Date	Time
2. Received by [signature]	Org.	Date 5/15/08	Time 1200	5. Received by	Org.	Date	Time
3. Relinquished by	Org.	Date	Time	6. Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0127
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/15/08 12:00
Reported: 05/27/08 17:11

ANALYTICAL REPORT

Sample ID: LRE0127-01 (085809-001/MWL-DP5-10-SG - Air) **Sampled: 05/08/08 14:30**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**11**		ppbv	2.5	10	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Benzene	ND		ppbv	1.5	3.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
2-Butanone (MEK)	**2.8**	J	ppbv	2.0	10	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Carbon disulfide	**2.4**	J	ppbv	2.0	10	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Chloroform	**1.2**	J	ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Dichlorodifluoromethane	**40**		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,1-Dichloroethene	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Methylene chloride	ND		ppbv	0.80	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Styrene	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Tetrachloroethene	**160**		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Toluene	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,1,1-Trichloroethane	**79**		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Trichloroethene	**10**		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0127 Project: MWL Remediation Project Number: 98045 02.02.02 / CF013-08	Received: 05/15/08 12:00 Reported: 05/27/08 17:11	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-01 (085809-001/MWL-DP5-10-SG - Air) - cont.						**Sampled: 05/08/08 14:30**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**24**		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,1,2-Trichloro-1,2,2-trifluoroethane	**36**		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/15/08 23:55	gcmsb	DLK	8E16005

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ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-01 (085809-001/MWL-DP5-10-SG - Air)						**Sampled: 05/08/08 14:30**				
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00014	0.00045	2.3	05/15/08 14:47	GC8-Rear	EI	8E16006

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0127
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/15/08 12:00
Reported: 05/27/08 17:11

ANALYTICAL REPORT

Sample ID: LRE0127-02 (085809-002/MWL-DP5-30-SG - Air) **Sampled: 05/09/08 09:00**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**33**		ppbv	2.5	10	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Benzene	**3.2**		ppbv	1.5	3.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
2-Butanone (MEK)	**10**		ppbv	2.0	10	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Chloroform	**4.8**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Dichlorodifluoromethane	**100**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,1-Dichloroethane	**3.6**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
cis-1,2-Dichloroethene	**1.3**	J	ppbv	0.80	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,1-Dichloroethene	**5.7**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
4-Ethyltoluene	**0.89**	J	ppbv	0.70	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Methylene chloride	ND		ppbv	0.80	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Styrene	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Tetrachloroethene	**370**		ppbv	4.2	8.5	4.2	05/16/08 16:41	gcmsb	DLK	8E17001
Toluene	**4.0**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,1,1-Trichloroethane	**150**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Trichloroethene	**68**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005

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Sandia National Laboratories	Work Order:	LRE0127	Received:	05/15/08 12:00
Payment Processing, MS 1385 P.O. Box 5130			Reported:	05/27/08 17:11
Albuquerque, NM 87185-0154	Project:	MWL Remediation		
Rita Kavanaugh	Project Number:	98045 02.02.02 / CF013-08		

ANALYTICAL REPORT

Sample ID: LRE0127-02 (085809-002/MWL-DP5-30-SG - Air) - cont. **Sampled: 05/09/08 09:00**

EPA TO14A - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Trichlorofluoromethane	**52**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,1,2-Trichloro-1,2,2-trifluoroethane	**90**		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,2,4-Trimethylbenzene	**1.3**	J	ppbv	1.3	3.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
m,p-Xylene	**2.9**	J	ppbv	2.0	4.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/16/08 00:42	gcmsb	DLK	8E16005

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Rita Kavanaugh

Work Order: LRE0127
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/15/08 12:00
Reported: 05/27/08 17:11

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-02 (085809-002/MWL-DP5-30-SG - Air)							**Sampled: 05/09/08 09:00**			
ASTM D1946 - Fixed Gases										
Methane	0.00022	J	%(v/v)	0.00013	0.00042	2.1	05/15/08 15:04	GC8-Rear	EI	8E16006

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Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0127
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/15/08 12:00
Reported: 05/27/08 17:11

ANALYTICAL REPORT

Sample ID: LRE0127-03 (085809-003/MWL-DP5-50-SG - Air) **Sampled: 05/09/08 09:37**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**38**		ppbv	2.6	10	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Benzene	ND		ppbv	1.5	3.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Benzyl chloride	ND		ppbv	8.2	26	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Bromoform	ND		ppbv	0.51	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Bromomethane	ND		ppbv	2.0	4.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
2-Butanone (MEK)	**15**		ppbv	2.0	10	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Chloroethane	ND		ppbv	1.5	4.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Chloroform	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Chloromethane	ND		ppbv	1.0	4.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,2-Dichlorobenzene	ND		ppbv	0.92	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,3-Dichlorobenzene	ND		ppbv	0.82	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,4-Dichlorobenzene	ND		ppbv	3.1	6.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Dichlorodifluoromethane	**2.3**		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
cis-1,2-Dichloroethene	ND		ppbv	0.82	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,1-Dichloroethene	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,2-Dichloropropane	ND		ppbv	1.5	3.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
4-Ethyltoluene	ND		ppbv	0.72	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Hexachlorobutadiene	ND		ppbv	1.3	4.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Methylene chloride	ND		ppbv	0.82	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Styrene	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Tetrachloroethene	**4.3**		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Toluene	**1.3**	J	ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,2,4-Trichlorobenzene	ND		ppbv	2.6	5.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,1,1-Trichloroethane	**1.2**	J	ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Trichloroethene	**1.6**	J	ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/15/08 12:00 05/27/08 17:11

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-03 (085809-003/MWL-DP5-50-SG - Air) - cont.						**Sampled: 05/09/08 09:37**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**1.3**	J	ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,1,2-Trichloro-1,2,2-trifluoroethane	**2.0**	J	ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
Vinyl chloride	ND		ppbv	1.5	3.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
m,p-Xylene	ND		ppbv	2.0	4.1	1.0	05/16/08 01:28	gcmsb	DLK	8E16005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/16/08 01:28	gcmsb	DLK	8E16005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: 05/15/08 12:00 Reported: 05/27/08 17:11

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-03 (085809-003/MWL-DP5-50-SG - Air)							**Sampled: 05/09/08 09:37**			
ASTM D1946 - Fixed Gases										
Methane	**0.00018**	J	%(v/v)	0.00013	0.00044	2.2	05/15/08 15:17	GC8-Rear	EI	8E16006

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Rita Kavanaugh

Work Order: LRE0127
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/15/08 12:00
Reported: 05/27/08 17:11

ANALYTICAL REPORT

Sample ID: LRE0127-04 (085813-001/MWL-DP5-10-SG-DUP - Air) **Sampled: 05/09/08 10:16**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**25**		ppbv	2.5	10	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Benzene	ND		ppbv	1.5	3.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Bromoform	ND		ppbv	0.50	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
2-Butanone (MEK)	**6.9**	J	ppbv	2.0	10	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Chloroform	**2.4**		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Dichlorodifluoromethane	**24**		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,1-Dichloroethane	**1.1**	J	ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,1-Dichloroethene	**1.2**	J	ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
2-Hexanone	ND		ppbv	2.0	10	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Methylene chloride	ND		ppbv	0.80	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Styrene	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Tetrachloroethene	**380**		ppbv	4.3	8.6	4.3	05/16/08 18:55	gcmsb	DLK	8E17001
Toluene	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,1,1-Trichloroethane	**150**		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Trichloroethene	**20**		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/15/08 12:00 05/27/08 17:11

ANALYTICAL REPORT

Sample ID: LRE0127-04 (085813-001/MWL-DP5-10-SG-DUP - Air) - cont. **Sampled: 05/09/08 10:16**

EPA TO14A - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Trichlorofluoromethane	**53**		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,1,2-Trichloro-1,2,2-trifluoroethane	**72**		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/16/08 17:28	gcmsb	DLK	8E17001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/15/08 12:00 05/27/08 17:11	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-04 (085813-001/MWL-DP5-10-SG-DUP - Air)							**Sampled: 05/09/08 10:16**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00013	0.00043	2.2	05/15/08 15:32	GC8-Rear	EI	8E16006

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Sandia National Laboratories
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Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0127
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/15/08 12:00
Reported: 05/27/08 17:11

ANALYTICAL REPORT

Sample ID: LRE0127-05 (085813-002/MWL-DP5-30-SG-DUP - Air) **Sampled: 05/09/08 09:02**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**36**		ppbv	2.5	9.9	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Benzene	**3.1**		ppbv	1.5	3.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Benzyl chloride	ND		ppbv	7.9	25	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Bromodichloromethane	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Bromoform	ND		ppbv	0.50	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Bromomethane	ND		ppbv	2.0	4.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
2-Butanone (MEK)	**13**		ppbv	2.0	9.9	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Carbon disulfide	ND		ppbv	2.0	9.9	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Carbon tetrachloride	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Chlorobenzene	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Dibromochloromethane	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Chloroethane	ND		ppbv	1.5	4.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Chloroform	**5.1**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Chloromethane	ND		ppbv	0.99	4.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,2-Dibromoethane (EDB)	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,2-Dichlorobenzene	ND		ppbv	0.89	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,3-Dichlorobenzene	ND		ppbv	0.79	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Dichlorodifluoromethane	**110**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,1-Dichloroethane	**3.8**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,2-Dichloroethane	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
cis-1,2-Dichloroethene	**1.3**	J	ppbv	0.79	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,1-Dichloroethene	**6.3**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,2-Dichloropropane	ND		ppbv	1.5	3.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
trans-1,3-Dichloropropene	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Ethylbenzene	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
4-Ethyltoluene	**0.88**	J	ppbv	0.70	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Hexachlorobutadiene	ND		ppbv	1.3	4.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
2-Hexanone	ND		ppbv	2.0	9.9	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Methylene chloride	**0.94**	J	ppbv	0.79	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	9.9	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Styrene	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,1,2,2-Tetrachloroethane	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Tetrachloroethene	**370**		ppbv	4.4	8.7	4.4	05/17/08 00:26	gcmsb	DLK	8E17001
Toluene	**4.0**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,1,1-Trichloroethane	**150**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,1,2-Trichloroethane	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Trichloroethene	**71**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/15/08 12:00 05/27/08 17:11	

ANALYTICAL REPORT

Sample ID: LRE0127-05 (085813-002/MWL-DP5-30-SG-DUP - Air) - cont. **Sampled: 05/09/08 09:02**

EPA TO14A - Volatile Organic Compounds by GC/MS - cont.

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Trichlorofluoromethane	**56**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,1,2-Trichloro-1,2,2-trifluoroethane	**94**		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,2,4-Trimethylbenzene	**1.3**	J	ppbv	1.3	3.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Vinyl acetate	ND		ppbv	2.0	9.9	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
Vinyl chloride	ND		ppbv	1.5	3.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
m,p-Xylene	**3.0**	J	ppbv	2.0	4.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001
o-Xylene	ND		ppbv	0.99	2.0	0.99	05/16/08 18:14	gcmsb	DLK	8E17001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/15/08 12:00 05/27/08 17:11	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-05 (085813-002/MWL-DP5-30-SG-DUP - Air)							**Sampled: 05/09/08 09:02**			
ASTM D1946 - Fixed Gases										
Methane	**0.00022**	J	%(v/v)	0.00013	0.00044	2.2	05/15/08 15:58	GC8-Rear	EI	8E16006

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0127
Project: MWL Remediation
Project Number: 98045 02.02.02 / CF013-08

Received: 05/15/08 12:00
Reported: 05/27/08 17:11

ANALYTICAL REPORT

Sample ID: LRE0127-06 (085813-003/MWL-DP5-50-SG-DUP - Air) **Sampled: 05/09/08 09:39**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**39**		ppbv	2.5	10	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Benzene	ND		ppbv	1.5	3.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Bromoform	ND		ppbv	0.50	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
2-Butanone (MEK)	**16**		ppbv	2.0	10	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Chloroform	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Dichlorodifluoromethane	**2.6**		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,1-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,1-Dichloroethene	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
2-Hexanone	ND		ppbv	2.0	10	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Methylene chloride	ND		ppbv	0.80	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Styrene	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Tetrachloroethene	**4.4**		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Toluene	**1.2**	J	ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,1,1-Trichloroethane	**1.3**	J	ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Trichloroethene	**1.7**	J	ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/15/08 12:00 05/27/08 17:11	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-06 (085813-003/MWL-DP5-50-SG-DUP - Air) - cont.						**Sampled: 05/09/08 09:39**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**1.3**	J	ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,1,2-Trichloro-1,2,2-trifluoroethane	**2.1**		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/16/08 19:42	gcmsb	DLK	8E17001

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0127 MWL Remediation 98045 02.02.02 / CF013-08	Received: 05/15/08 12:00 Reported: 05/27/08 17:11

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0127-06 (085813-003/MWL-DP5-50-SG-DUP - Air)							**Sampled: 05/09/08 09:39**			
ASTM D1946 - Fixed Gases										
Methane	**0.00018**	J	%(v/v)	0.00013	0.00043	2.1	05/15/08 16:15	GC8-Rear	EI	8E16006

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. M/A

SMO Use LRE0205

AR/COC 611878

Dept. No./Mail Stop:	6765/MS1089	Date Samples Shipped:	5-22-08	Project/Task No.:	98045/02.02.02
Project/Task Manager:	P. Freshour	Carrier/Waybill No.	900333	SMO Authorization:	[signature]
Project Name:	MWL Remediation	Lab Contact:	T. MISTRY	Contract #:	PO691437
Record Center Code:		Lab Destination:	Test America CA SANTA ANA		
Logbook Ref. No.:		SMO Contact/Phone:	P. Puisant/505-844-3185		
Service Order No.	CF013-08	Send Report to SMO:	Rita Kavanaugh 284-2553		

SEE BOTTLE ORDER

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☐ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Location	Tech Area
Building	Room

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
085810-001	MWL-DP6-10-SG	N/A	MWL	5/21/08 1432	SG	SC	6L	NONE	G	SA	TO-14 + Methane	
085810-002	MWL-DP6-30-SG	N/A	MWL	5/21/08 1504	SG	SC	6L	NONE	G	SA	TO-14 + Methane	
085814-001	MWL-DP6-10-SG-DUP	N/A	MWL	5/21/08 1432	SG	SC	6L	NONE	G	~~DUSA~~ DUP	TO-14 + Methane	
085814-002	MWL-DP6-30-SG-DUP	N/A	MWL	5/21/08 1504	SG	SC	6L	NONE	G	~~DUSA~~ DUP	TO-14 + Methane	

RMMA	☑ Yes ☐ No Ref. No.	Sample Tracking	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	30 day ~~Normal~~ ☑ ~~Normal~~ ☒ Rush	Entered by:	
Return Samples By:	Level of Rush: 7 DAY TAT	QC inits:	

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	[signature]	RL	Weston/4133/505-844-1013
	Bill Gibson	[signature]	WG	Weston/4133/505-284-5232

*Please list as separate report.

1.Relinquished by [signature]	Org. 4133	Date 5/22/08	Time 0800	4.Relinquished by	Org.	Date	Time
1. Received by [signature]	Org. 4133	Date 5/22/08	Time 0800	4. Received by	Org.	Date	Time
2.Relinquished by [signature]	Org. 4133	Date 5/22/08	Time 0900	5.Relinquished by	Org.	Date	Time
2. Received by [signature]	Org. TA LA	Date 5/23/08	Time 0945	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

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Rita Kavanaugh

Work Order: LRE0205
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/23/08 09:45
Reported: 05/30/08 16:32

ANALYTICAL REPORT

Sample ID: LRE0205-01 (085810-001/MWL-DP6-10-SG - Air) **Sampled: 05/21/08 14:32**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**9.3**	J	ppbv	2.5	10	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Benzene	ND		ppbv	1.5	3.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
2-Butanone (MEK)	ND		ppbv	2.0	10	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Chloroform	**1.4**	J	ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Dichlorodifluoromethane	**31**		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,1-Dichloroethane	**1.0**	J	ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,1-Dichloroethene	**3.6**		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Methylene chloride	ND		ppbv	0.80	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Styrene	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Tetrachloroethene	**1.2**	J	ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Toluene	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,1,1-Trichloroethane	**4.7**		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Trichloroethene	**4.2**		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0205 Project: MWL Remediation Project Number: 98045/02.02.02/CF013-08	Received: 05/23/08 09:45 Reported: 05/30/08 16:32	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-01 (085810-001/MWL-DP6-10-SG - Air) - cont.						**Sampled: 05/21/08 14:32**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**12**		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,1,2-Trichloro-1,2,2-trifluoroethane	**44**		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/27/08 21:41	gcmsa	AD	8E28005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/27/08 21:41	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0205 Project: MWL Remediation Project Number: 98045/02.02.02/CF013-08	Received: 05/23/08 09:45 Reported: 05/30/08 16:32	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-01 (085810-001/MWL-DP6-10-SG - Air)							**Sampled: 05/21/08 14:32**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00019	0.00064	3.2	05/28/08 09:33	GC8	EI	8E29005

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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0205
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/23/08 09:45
Reported: 05/30/08 16:32

ANALYTICAL REPORT

Sample ID: LRE0205-02 (085810-002/MWL-DP6-30-SG - Air) **Sampled: 05/21/08 15:04**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**23**	J	ppbv	7.9	31	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Benzene	ND		ppbv	4.7	9.4	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Benzyl chloride	ND		ppbv	25	79	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Bromodichloromethane	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Bromoform	ND		ppbv	1.6	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Bromomethane	ND		ppbv	6.3	13	3.1	05/27/08 22:17	gcmsa	AD	8E28005
2-Butanone (MEK)	**10**	J	ppbv	6.3	31	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Carbon disulfide	ND		ppbv	6.3	31	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Carbon tetrachloride	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Chlorobenzene	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Dibromochloromethane	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Chloroethane	ND		ppbv	4.7	13	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Chloroform	**3.7**	J	ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Chloromethane	ND		ppbv	3.1	13	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,2-Dibromoethane (EDB)	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,2-Dichlorobenzene	ND		ppbv	2.8	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,3-Dichlorobenzene	ND		ppbv	2.5	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,4-Dichlorobenzene	ND		ppbv	9.4	19	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Dichlorodifluoromethane	**53**		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,1-Dichloroethane	**3.4**	J	ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,2-Dichloroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
cis-1,2-Dichloroethene	ND		ppbv	2.5	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,1-Dichloroethene	**11**		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,2-Dichloropropane	ND		ppbv	4.7	9.4	3.1	05/27/08 22:17	gcmsa	AD	8E28005
cis-1,3-Dichloropropene	ND		ppbv	4.7	9.4	3.1	05/27/08 22:17	gcmsa	AD	8E28005
trans-1,3-Dichloropropene	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Ethylbenzene	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
4-Ethyltoluene	ND		ppbv	2.2	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Hexachlorobutadiene	ND		ppbv	4.1	13	3.1	05/27/08 22:17	gcmsa	AD	8E28005
2-Hexanone	ND		ppbv	6.3	31	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Methylene chloride	ND		ppbv	2.5	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	6.3	31	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Styrene	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,1,2,2-Tetrachloroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Tetrachloroethene	**310**		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Toluene	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,2,4-Trichlorobenzene	ND		ppbv	7.9	16	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,1,1-Trichloroethane	**16**		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,1,2-Trichloroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Trichloroethene	**110**		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0205 Project: MWL Remediation Project Number: 98045/02.02.02/CF013-08	Received: 05/23/08 09:45 Reported: 05/30/08 16:32	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-02 (085810-002/MWL-DP6-30-SG - Air) - cont.						**Sampled: 05/21/08 15:04**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**20**		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,1,2-Trichloro-1,2,2-trifluoroethane	**110**		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,2,4-Trimethylbenzene	ND		ppbv	4.1	9.4	3.1	05/27/08 22:17	gcmsa	AD	8E28005
1,3,5-Trimethylbenzene	ND		ppbv	3.5	9.4	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Vinyl acetate	ND		ppbv	6.3	31	3.1	05/27/08 22:17	gcmsa	AD	8E28005
Vinyl chloride	ND		ppbv	4.7	9.4	3.1	05/27/08 22:17	gcmsa	AD	8E28005
m,p-Xylene	ND		ppbv	6.3	13	3.1	05/27/08 22:17	gcmsa	AD	8E28005
o-Xylene	ND		ppbv	3.1	6.3	3.1	05/27/08 22:17	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0205 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/23/08 09:45 05/30/08 16:32	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-02 (085810-002/MWL-DP6-30-SG - Air)							**Sampled: 05/21/08 15:04**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00019	0.00063	3.1	05/28/08 09:50	GC8	EI	8E29005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0205 Project: MWL Remediation Project Number: 98045/02.02.02/CF013-08	Received: 05/23/08 09:45 Reported: 05/30/08 16:32	

ANALYTICAL REPORT

Sample ID: LRE0205-03 (085814-001/MWL-DP6-10-SG-DUP - Air) **Sampled: 05/21/08 14:32**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**11**		ppbv	2.5	10	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Benzene	ND		ppbv	1.5	3.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Benzyl chloride	ND		ppbv	8.0	25	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Bromodichloromethane	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Bromoform	ND		ppbv	0.50	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Bromomethane	ND		ppbv	2.0	4.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
2-Butanone (MEK)	**5.2**	J	ppbv	2.0	10	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Carbon disulfide	ND		ppbv	2.0	10	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Carbon tetrachloride	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Chlorobenzene	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Dibromochloromethane	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Chloroethane	ND		ppbv	1.5	4.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Chloroform	**2.2**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Chloromethane	ND		ppbv	1.0	4.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,2-Dibromoethane (EDB)	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,2-Dichlorobenzene	ND		ppbv	0.90	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,3-Dichlorobenzene	ND		ppbv	0.80	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,4-Dichlorobenzene	ND		ppbv	3.0	6.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Dichlorodifluoromethane	**30**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,1-Dichloroethane	**1.2**	J	ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,2-Dichloroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
cis-1,2-Dichloroethene	ND		ppbv	0.80	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,1-Dichloroethene	**4.3**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,2-Dichloropropane	ND		ppbv	1.5	3.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
cis-1,3-Dichloropropene	ND		ppbv	1.5	3.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
trans-1,3-Dichloropropene	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Ethylbenzene	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
4-Ethyltoluene	ND		ppbv	0.70	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Hexachlorobutadiene	ND		ppbv	1.3	4.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
2-Hexanone	ND		ppbv	2.0	10	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Methylene chloride	**0.85**	J	ppbv	0.80	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	2.0	10	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Styrene	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,1,2,2-Tetrachloroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Tetrachloroethene	**190**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Toluene	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,2,4-Trichlorobenzene	ND		ppbv	2.5	5.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,1,1-Trichloroethane	**11**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,1,2-Trichloroethane	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Trichloroethene	**42**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0205 MWL Remediation 98045/02.02.02/CF013-08	Received: 05/23/08 09:45 Reported: 05/30/08 16:32

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-03 (085814-001/MWL-DP6-10-SG-DUP - Air) - cont.						**Sampled: 05/21/08 14:32**				
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**13**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,1,2-Trichloro-1,2,2-trifluoroethane	**62**		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,2,4-Trimethylbenzene	ND		ppbv	1.3	3.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
1,3,5-Trimethylbenzene	ND		ppbv	1.1	3.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Vinyl acetate	ND		ppbv	2.0	10	1.0	05/27/08 22:56	gcmsa	AD	8E28005
Vinyl chloride	ND		ppbv	1.5	3.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
m,p-Xylene	ND		ppbv	2.0	4.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005
o-Xylene	ND		ppbv	1.0	2.0	1.0	05/27/08 22:56	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0205 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/23/08 09:45 05/30/08 16:32

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-03 (085814-001/MWL-DP6-10-SG-DUP - Air)							**Sampled: 05/21/08 14:32**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00017	0.00056	2.8	05/28/08 10:09	GC8	EI	8E29005

TestAmerica
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Sandia National Laboratories
Payment Processing, MS 1385 P.O. Box 5130
Albuquerque, NM 87185-0154
Rita Kavanaugh

Work Order: LRE0205
Project: MWL Remediation
Project Number: 98045/02.02.02/CF013-08

Received: 05/23/08 09:45
Reported: 05/30/08 16:32

ANALYTICAL REPORT

Sample ID: LRE0205-04 (085814-002/MWL-DP6-30-SG-DUP - Air) **Sampled: 05/21/08 15:04**

EPA TO14A - Volatile Organic Compounds by GC/MS

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Acetone	**18**	J	ppbv	7.9	31	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Benzene	ND		ppbv	4.7	9.4	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Benzyl chloride	ND		ppbv	25	79	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Bromodichloromethane	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Bromoform	ND		ppbv	1.6	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Bromomethane	ND		ppbv	6.3	13	3.1	05/27/08 23:31	gcmsa	AD	8E28005
2-Butanone (MEK)	**8.3**	J	ppbv	6.3	31	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Carbon disulfide	ND		ppbv	6.3	31	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Carbon tetrachloride	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Chlorobenzene	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Dibromochloromethane	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Chloroethane	ND		ppbv	4.7	13	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Chloroform	**4.0**	J	ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Chloromethane	ND		ppbv	3.1	13	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,2-Dibromoethane (EDB)	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,2-Dichlorobenzene	ND		ppbv	2.8	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,3-Dichlorobenzene	ND		ppbv	2.5	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,4-Dichlorobenzene	ND		ppbv	9.4	19	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Dichlorodifluoromethane	**53**		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,1-Dichloroethane	**3.3**	J	ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,2-Dichloroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
cis-1,2-Dichloroethene	ND		ppbv	2.5	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,1-Dichloroethene	**11**		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,2-Dichloropropane	ND		ppbv	4.7	9.4	3.1	05/27/08 23:31	gcmsa	AD	8E28005
cis-1,3-Dichloropropene	ND		ppbv	4.7	9.4	3.1	05/27/08 23:31	gcmsa	AD	8E28005
trans-1,3-Dichloropropene	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Ethylbenzene	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
4-Ethyltoluene	ND		ppbv	2.2	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Hexachlorobutadiene	ND		ppbv	4.1	13	3.1	05/27/08 23:31	gcmsa	AD	8E28005
2-Hexanone	ND		ppbv	6.3	31	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Methylene chloride	ND		ppbv	2.5	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
4-Methyl-2-pentanone (MIBK)	ND		ppbv	6.3	31	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Styrene	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,1,2,2-Tetrachloroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Tetrachloroethene	**300**		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Toluene	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,2,4-Trichlorobenzene	ND		ppbv	7.9	16	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,1,1-Trichloroethane	**16**		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,1,2-Trichloroethane	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Trichloroethene	**110**		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: LRE0205 Project: MWL Remediation Project Number: 98045/02.02.02/CF013-08	Received: 05/23/08 09:45 Reported: 05/30/08 16:32	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-04 (085814-002/MWL-DP6-30-SG-DUP - Air) - cont.							**Sampled: 05/21/08 15:04**			
EPA TO14A - Volatile Organic Compounds by GC/MS - cont.										
Trichlorofluoromethane	**20**		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,1,2-Trichloro-1,2,2-trifluoroethane	**110**		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,2,4-Trimethylbenzene	ND		ppbv	4.1	9.4	3.1	05/27/08 23:31	gcmsa	AD	8E28005
1,3,5-Trimethylbenzene	ND		ppbv	3.5	9.4	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Vinyl acetate	ND		ppbv	6.3	31	3.1	05/27/08 23:31	gcmsa	AD	8E28005
Vinyl chloride	ND		ppbv	4.7	9.4	3.1	05/27/08 23:31	gcmsa	AD	8E28005
m,p-Xylene	ND		ppbv	6.3	13	3.1	05/27/08 23:31	gcmsa	AD	8E28005
o-Xylene	ND		ppbv	3.1	6.3	3.1	05/27/08 23:31	gcmsa	AD	8E28005

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Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0205 MWL Remediation 98045/02.02.02/CF013-08	Received: Reported:	05/23/08 09:45 05/30/08 16:32	

ANALYTICAL REPORT

Analyte	Result	Data Qualifiers	Units	MDL	RL	Dilution	Date Analyzed	Instrument	Analyst	QC Batch
Sample ID: LRE0205-04 (085814-002/MWL-DP6-30-SG-DUP - Air)							**Sampled: 05/21/08 15:04**			
ASTM D1946 - Fixed Gases										
Methane	ND		%(v/v)	0.00019	0.00063	3.1	05/28/08 10:25	GC8	EI	8E29005

E8D210164

Attachment 6
Page 1 of 1

4/16/08 [illegible]

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

PAUL FROSHOUR

Internal Lab

Page 1 of ~~2~~ 1

Batch No. N/A

SMO Use

E8D210164

AR/COC **611812**

Dept. No./Mail Stop:	4133/MS-1042	Date Samples Shipped:	4/16/08	Project/Task No.:	98045/02.02.02
Project/Task Manager:	~~FRANZ LAUFFER~~	Carrier/Waybill No.	88805	SMO Authorization:	[signature]
Project Name:	MWL REMEDIATION	Lab Contact:	TRUPTI MISTRY	Contract #:	PO691437
Record Center Code:	ER/1345/DAT	Lab Destination:	Test America SANTA ANA, CA. SEE BOTTLE ORDER.		
Logbook Ref. No.:	003	SMO Contact/Phone:	P. Pulsant/505-844-3185		
Service Order No.	~~CE029-08~~	Send Report to SMO:	Rita Kavanaugh 284-2553		
Location	Tech Area				
Building	Room				

☐ Waste Characterization
-Send preliminary/copy report to:

☐ Released by COC No.:
☐ Validation Required

Bill To: Sandia National Labs (Accounts Payable)
P.O. Box 5800 MS 0154
Albuquerque, NM 87185-0154

Reference LOV(available at SMO)

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Pump Depth (ft)	ER Site No.	Date/Time(hr) Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
085811-001	MWL-DP7-10-SG	N/A	MWL	4/10/08 09:50	SG	SC	6L	NONE	G	SA	TO-14 + METHANE	
085811-002	MWL-DP7-30-SG	N/A	MWL	4/10/08 10:10	SG	SC	6L	NONE	G	SA	TO-14	
085812-001	MWL-DP8-10-SG	N/A	MWL	4/09/08 11:30	SG	SC	6L	NONE	G	SA	TO-14	
085812-002	MWL-DP8-30-SG	N/A	MWL	4/09/08 11:50	SG	SC	6L	NONE	G	SA	TO-14	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time 30 day ☑ Normal ☐ Rush

Return Samples By: Level of Rush: QC Inits.

Sample Tracking Smo Use
Date Entered(mm/dd/yy)
Entered by:

Special Instructions/QC Requirements
EDD ☑ Yes ☐ No
Level D Package ☐ Yes ☑ No
*Send report to:

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members

Name	Signature	Init	Company/Organization/Phone/Cellular
Robert Lynch	[signature]	RL	Weston/4133/844-1013
Danielle Nieto	[signature]	DN	Sandia/4133/505-845-7706

1.Relinquished by [signature]	Org. 4133	Date 4/16/08	Time 0814	4.Relinquished by	Org.	Date	Time
1. Received by [signature] SMO	Org. 4133	Date 4/16/08	Time 0814	4. Received by	Org.	Date	Time
2.Relinquished by [signature] SMO	Org. 4133	Date 4/16/08	Time 1055	5.Relinquished by	Org.	Date	Time
2. Received by [signature]	Org. TA-LA	Date 4/21/08	Time 1230	5. Received by	Org.	Date	Time
3.Relinquished by	Org.	Date	Time	6.Relinquished by	Org.	Date	Time
3. Received by	Org.	Date	Time	6. Received by	Org.	Date	Time

Sandia National Laboratories

Client Sample ID: 085811-001/MWL-DP7-10-SG

GC/MS Volatiles

Lot-Sample #...: E8D210164-001 **Work Order #...:** KLPCA1AC **Matrix.....:** AE
Date Sampled...: 04/10/08 **Date Received..:** 04/21/08
Prep Date.....: 04/23/08 **Analysis Date..:** 04/23/08
Prep Batch #...: 8114578 **Analysis Time..:** 03:11
Dilution Factor: 1
Analyst ID.....: 015590 **Instrument ID..:** MSA
Method.....: EPA-21 TO-14A

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**16**	**10**	**ppb(v/v)**	**2.5**
Benzene	**2.0 J**	**3.0**	**ppb(v/v)**	**1.5**
Benzyl chloride	ND	25	ppb(v/v)	8.0
Bromodichloromethane	ND	2.0	ppb(v/v)	1.0
Bromoform	ND	2.0	ppb(v/v)	0.50
Bromomethane	ND	4.0	ppb(v/v)	2.0
2-Butanone (MEK)	**3.2 J**	**10**	**ppb(v/v)**	**2.0**
Carbon disulfide	ND	10	ppb(v/v)	2.0
Carbon tetrachloride	ND	2.0	ppb(v/v)	1.0
Chlorobenzene	ND	2.0	ppb(v/v)	1.0
Dibromochloromethane	ND	2.0	ppb(v/v)	1.0
Chloroethane	ND	4.0	ppb(v/v)	1.5
Chloroform	ND	2.0	ppb(v/v)	1.0
Chloromethane	ND	4.0	ppb(v/v)	1.0
1,2-Dibromoethane (EDB)	ND	2.0	ppb(v/v)	1.0
1,2-Dichlorobenzene	ND	2.0	ppb(v/v)	0.90
1,3-Dichlorobenzene	ND	2.0	ppb(v/v)	0.80
1,4-Dichlorobenzene	ND	6.0	ppb(v/v)	3.0
Dichlorodifluoromethane	ND	2.0	ppb(v/v)	1.0
1,1-Dichloroethane	ND	2.0	ppb(v/v)	1.0
1,2-Dichloroethane	ND	2.0	ppb(v/v)	1.0
cis-1,2-Dichloroethene	ND	2.0	ppb(v/v)	0.80
1,1-Dichloroethene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloropropane	ND	3.0	ppb(v/v)	1.5
cis-1,3-Dichloropropene	ND	3.0	ppb(v/v)	1.5
trans-1,3-Dichloropropene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	2.0	ppb(v/v)	1.0
Ethylbenzene	ND	2.0	ppb(v/v)	1.0
4-Ethyltoluene	ND	2.0	ppb(v/v)	0.70
Hexachlorobutadiene	ND	4.0	ppb(v/v)	1.3
2-Hexanone	ND	10	ppb(v/v)	2.0
Methylene chloride	ND	2.0	ppb(v/v)	0.80
4-Methyl-2-pentanone (MIBK)	ND	10	ppb(v/v)	2.0
Styrene	ND	2.0	ppb(v/v)	1.0
1,1,2,2-Tetrachloroethane	ND	2.0	ppb(v/v)	1.0

(Continued on next page)

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Client Sample ID: 085811-001/MWL-DP7-10-SG

GC/MS Volatiles

Lot-Sample #...: E8D210164-001 **Work Order #...:** KLPCA1AC **Matrix.....:** AE

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Tetrachloroethene	ND	2.0	ppb(v/v)	1.0
Toluene	**2.1**	**2.0**	**ppb(v/v)**	**1.0**
1,2,4-Trichloro-benzene	ND	5.0	ppb(v/v)	2.5
1,1,1-Trichloroethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloroethane	ND	2.0	ppb(v/v)	1.0
Trichloroethene	ND	2.0	ppb(v/v)	1.0
Trichlorofluoromethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.0	ppb(v/v)	1.0
1,2,4-Trimethylbenzene	ND	3.0	ppb(v/v)	1.3
1,3,5-Trimethylbenzene	ND	3.0	ppb(v/v)	1.1
Vinyl acetate	ND	10	ppb(v/v)	2.0
Vinyl chloride	ND	3.0	ppb(v/v)	1.5
m-Xylene & p-Xylene	ND	4.0	ppb(v/v)	2.0
o-Xylene	ND	2.0	ppb(v/v)	1.0

NOTE(S):

J Estimated result. Result is less than RL.

Sandia National Laboratories

Client Sample ID: 085811-001/MWL-DP7-10-SG

GC Volatiles

Lot-Sample #...:	E8D210164-001	Work Order #...:	KLPCA1AD	Matrix.....:	AE
Date Sampled...:	04/10/08	Date Received..:	04/21/08		
Prep Date.....:	04/23/08	Analysis Date..:	04/23/08		
Prep Batch #...:	8114474	Analysis Time..:	14:27		
Dilution Factor:	3.28				
Analyst ID.....:	999995	Instrument ID..:	GC8		
		Method.....:	ASTM D1946		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Methane	ND	0.00066	%(v/v)	0.00020

Sandia National Laboratories

Client Sample ID: 085811-002/MWL-DP7-30-SG

GC/MS Volatiles

Lot-Sample #...:	E8D210164-002	Work Order #...:	KLPCD1AC	Matrix.....:	AE
Date Sampled...:	04/10/08	Date Received..:	04/21/08		
Prep Date.....:	04/23/08	Analysis Date..:	04/23/08		
Prep Batch #...:	8114578	Analysis Time..:	03:57		
Dilution Factor:	1				
Analyst ID.....:	015590	Instrument ID..:	MSA		
		Method.....:	EPA-21 TO-14A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**83**	**10**	**ppb(v/v)**	**2.5**
Benzene	**5.2**	**3.0**	**ppb(v/v)**	**1.5**
Benzyl chloride	ND	25	ppb(v/v)	8.0
Bromodichloromethane	ND	2.0	ppb(v/v)	1.0
Bromoform	ND	2.0	ppb(v/v)	0.50
Bromomethane	ND	4.0	ppb(v/v)	2.0
2-Butanone (MEK)	**17**	**10**	**ppb(v/v)**	**2.0**
Carbon disulfide	**7.7 J**	**10**	**ppb(v/v)**	**2.0**
Carbon tetrachloride	ND	2.0	ppb(v/v)	1.0
Chlorobenzene	ND	2.0	ppb(v/v)	1.0
Dibromochloromethane	ND	2.0	ppb(v/v)	1.0
Chloroethane	ND	4.0	ppb(v/v)	1.5
Chloroform	ND	2.0	ppb(v/v)	1.0
Chloromethane	**2.2 J**	**4.0**	**ppb(v/v)**	**1.0**
1,2-Dibromoethane (EDB)	ND	2.0	ppb(v/v)	1.0
1,2-Dichlorobenzene	ND	2.0	ppb(v/v)	0.90
1,3-Dichlorobenzene	ND	2.0	ppb(v/v)	0.80
1,4-Dichlorobenzene	ND	6.0	ppb(v/v)	3.0
Dichlorodifluoromethane	ND	2.0	ppb(v/v)	1.0
1,1-Dichloroethane	ND	2.0	ppb(v/v)	1.0
1,2-Dichloroethane	ND	2.0	ppb(v/v)	1.0
cis-1,2-Dichloroethene	ND	2.0	ppb(v/v)	0.80
1,1-Dichloroethene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloropropane	ND	3.0	ppb(v/v)	1.5
cis-1,3-Dichloropropene	ND	3.0	ppb(v/v)	1.5
trans-1,3-Dichloropropene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	2.0	ppb(v/v)	1.0
Ethylbenzene	**1.7 J**	**2.0**	**ppb(v/v)**	**1.0**
4-Ethyltoluene	**1.4 J**	**2.0**	**ppb(v/v)**	**0.70**
Hexachlorobutadiene	ND	4.0	ppb(v/v)	1.3
2-Hexanone	ND	10	ppb(v/v)	2.0
Methylene chloride	**0.93 J**	**2.0**	**ppb(v/v)**	**0.80**
4-Methyl-2-pentanone (MIBK)	ND	10	ppb(v/v)	2.0
Styrene	ND	2.0	ppb(v/v)	1.0
1,1,2,2-Tetrachloroethane	ND	2.0	ppb(v/v)	1.0

(Continued on next page)

Sandia National Laboratories

Client Sample ID: 085811-002/MWL-DP7-30-SG

GC/MS Volatiles

Lot-Sample #...: E8D210164-002 Work Order #...: KLPCD1AC Matrix.....: AE

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Tetrachloroethene	ND	2.0	ppb(v/v)	1.0
Toluene	**6.8**	**2.0**	**ppb(v/v)**	**1.0**
1,2,4-Trichloro-benzene	ND	5.0	ppb(v/v)	2.5
1,1,1-Trichloroethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloroethane	ND	2.0	ppb(v/v)	1.0
Trichloroethene	ND	2.0	ppb(v/v)	1.0
Trichlorofluoromethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.0	ppb(v/v)	1.0
1,2,4-Trimethylbenzene	**1.6 J**	**3.0**	**ppb(v/v)**	**1.3**
1,3,5-Trimethylbenzene	ND	3.0	ppb(v/v)	1.1
Vinyl acetate	ND	10	ppb(v/v)	2.0
Vinyl chloride	ND	3.0	ppb(v/v)	1.5
m-Xylene & p-Xylene	**7.2**	**4.0**	**ppb(v/v)**	**2.0**
o-Xylene	**1.9 J**	**2.0**	**ppb(v/v)**	**1.0**

NOTE(S):

J Estimated result. Result is less than RL.

Sandia National Laboratories

Client Sample ID: 085811-002/MWL-DP7-30-SG

GC Volatiles

Lot-Sample #...:	E8D210164-002	Work Order #...:	KLPCD1AD	Matrix.....:	AE
Date Sampled...:	04/10/08	Date Received..:	04/21/08		
Prep Date.....:	04/23/08	Analysis Date..:	04/23/08		
Prep Batch #...:	8114474	Analysis Time..:	14:40		
Dilution Factor:	2.44				
Analyst ID.....:	999995	Instrument ID..:	GC8		
		Method.....:	ASTM D1946		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Methane	ND	0.00049	%(v/v)	0.00015

Sandia National Laboratories

Client Sample ID: 085812-001/MWL-DP8-10-SG

GC/MS Volatiles

Lot-Sample #...: E8D210164-003 Work Order #...: KLPCE1AC Matrix.....: AE
Date Sampled...: 04/09/08 Date Received..: 04/21/08
Prep Date.....: 04/23/08 Analysis Date..: 04/23/08
Prep Batch #...: 8114578 Analysis Time..: 04:48
Dilution Factor: 1
Analyst ID.....: 015590 Instrument ID..: MSA
Method.....: EPA-21 TO-14A

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**16**	**10**	**ppb(v/v)**	**2.5**
Benzene	ND	3.0	ppb(v/v)	1.5
Benzyl chloride	ND	25	ppb(v/v)	8.0
Bromodichloromethane	ND	2.0	ppb(v/v)	1.0
Bromoform	ND	2.0	ppb(v/v)	0.50
Bromomethane	ND	4.0	ppb(v/v)	2.0
2-Butanone (MEK)	**2.9 J**	**10**	**ppb(v/v)**	**2.0**
Carbon disulfide	ND	10	ppb(v/v)	2.0
Carbon tetrachloride	ND	2.0	ppb(v/v)	1.0
Chlorobenzene	ND	2.0	ppb(v/v)	1.0
Dibromochloromethane	ND	2.0	ppb(v/v)	1.0
Chloroethane	ND	4.0	ppb(v/v)	1.5
Chloroform	ND	2.0	ppb(v/v)	1.0
Chloromethane	ND	4.0	ppb(v/v)	1.0
1,2-Dibromoethane (EDB)	ND	2.0	ppb(v/v)	1.0
1,2-Dichlorobenzene	ND	2.0	ppb(v/v)	0.90
1,3-Dichlorobenzene	ND	2.0	ppb(v/v)	0.80
1,4-Dichlorobenzene	ND	6.0	ppb(v/v)	3.0
Dichlorodifluoromethane	ND	2.0	ppb(v/v)	1.0
1,1-Dichloroethane	ND	2.0	ppb(v/v)	1.0
1,2-Dichloroethane	ND	2.0	ppb(v/v)	1.0
cis-1,2-Dichloroethene	ND	2.0	ppb(v/v)	0.80
1,1-Dichloroethene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloropropane	ND	3.0	ppb(v/v)	1.5
cis-1,3-Dichloropropene	ND	3.0	ppb(v/v)	1.5
trans-1,3-Dichloropropene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	2.0	ppb(v/v)	1.0
Ethylbenzene	ND	2.0	ppb(v/v)	1.0
4-Ethyltoluene	ND	2.0	ppb(v/v)	0.70
Hexachlorobutadiene	ND	4.0	ppb(v/v)	1.3
2-Hexanone	ND	10	ppb(v/v)	2.0
Methylene chloride	ND	2.0	ppb(v/v)	0.80
4-Methyl-2-pentanone (MIBK)	ND	10	ppb(v/v)	2.0
Styrene	ND	2.0	ppb(v/v)	1.0
1,1,2,2-Tetrachloroethane	ND	2.0	ppb(v/v)	1.0

(Continued on next page)

Sandia National Laboratories

Client Sample ID: 085812-001/MWL-DP8-10-SG

GC/MS Volatiles

Lot-Sample #...: E8D210164-003 Work Order #...: KLPCE1AC Matrix.....: AE

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Tetrachloroethene	ND	2.0	ppb(v/v)	1.0
Toluene	ND	2.0	ppb(v/v)	1.0
1,2,4-Trichloro-benzene	ND	5.0	ppb(v/v)	2.5
1,1,1-Trichloroethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloroethane	ND	2.0	ppb(v/v)	1.0
Trichloroethene	ND	2.0	ppb(v/v)	1.0
Trichlorofluoromethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.0	ppb(v/v)	1.0
1,2,4-Trimethylbenzene	ND	3.0	ppb(v/v)	1.3
1,3,5-Trimethylbenzene	ND	3.0	ppb(v/v)	1.1
Vinyl acetate	ND	10	ppb(v/v)	2.0
Vinyl chloride	ND	3.0	ppb(v/v)	1.5
m-Xylene & p-Xylene	ND	4.0	ppb(v/v)	2.0
o-Xylene	ND	2.0	ppb(v/v)	1.0

NOTE(S):

J Estimated result. Result is less than RL.

Sandia National Laboratories

Client Sample ID: 085812-001/MWL-DP8-10-SG

GC Volatiles

Lot-Sample #...:	E8D210164-003	Work Order #...:	KLPCE1AD	Matrix.....:	AE
Date Sampled...:	04/09/08	Date Received..:	04/21/08		
Prep Date.....:	04/23/08	Analysis Date..:	04/23/08		
Prep Batch #...:	8114474	Analysis Time..:	14:54		
Dilution Factor:	3.16				
Analyst ID.....:	999995	Instrument ID..:	GC8		
		Method.....:	ASTM D1946		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Methane	ND	0.00063	%(v/v)	0.00019

Sandia National Laboratories

Client Sample ID: 085812-002/MWL-DP8-30-SG

GC/MS Volatiles

Lot-Sample #...:	E8D210164-004	Work Order #...:	KLPCF1AC	Matrix.....:	AE
Date Sampled...:	04/09/08	Date Received..:	04/21/08		
Prep Date.....:	04/23/08	Analysis Date..:	04/23/08		
Prep Batch #...:	8114578	Analysis Time..:	05:37		
Dilution Factor:	1				
Analyst ID.....:	015590	Instrument ID..:	MSA		
		Method.....:	EPA-21 TO-14A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Acetone	**62**	**10**	**ppb(v/v)**	**2.5**
Benzene	ND	3.0	ppb(v/v)	1.5
Benzyl chloride	ND	25	ppb(v/v)	8.0
Bromodichloromethane	ND	2.0	ppb(v/v)	1.0
Bromoform	ND	2.0	ppb(v/v)	0.50
Bromomethane	ND	4.0	ppb(v/v)	2.0
2-Butanone (MEK)	**13**	**10**	**ppb(v/v)**	**2.0**
Carbon disulfide	**5.5 J**	**10**	**ppb(v/v)**	**2.0**
Carbon tetrachloride	ND	2.0	ppb(v/v)	1.0
Chlorobenzene	ND	2.0	ppb(v/v)	1.0
Dibromochloromethane	ND	2.0	ppb(v/v)	1.0
Chloroethane	ND	4.0	ppb(v/v)	1.5
Chloroform	ND	2.0	ppb(v/v)	1.0
Chloromethane	ND	4.0	ppb(v/v)	1.0
1,2-Dibromoethane (EDB)	ND	2.0	ppb(v/v)	1.0
1,2-Dichlorobenzene	ND	2.0	ppb(v/v)	0.90
1,3-Dichlorobenzene	ND	2.0	ppb(v/v)	0.80
1,4-Dichlorobenzene	ND	6.0	ppb(v/v)	3.0
Dichlorodifluoromethane	ND	2.0	ppb(v/v)	1.0
1,1-Dichloroethane	ND	2.0	ppb(v/v)	1.0
1,2-Dichloroethane	ND	2.0	ppb(v/v)	1.0
cis-1,2-Dichloroethene	ND	2.0	ppb(v/v)	0.80
1,1-Dichloroethene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloropropane	ND	3.0	ppb(v/v)	1.5
cis-1,3-Dichloropropene	ND	3.0	ppb(v/v)	1.5
trans-1,3-Dichloropropene	ND	2.0	ppb(v/v)	1.0
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	2.0	ppb(v/v)	1.0
Ethylbenzene	ND	2.0	ppb(v/v)	1.0
4-Ethyltoluene	ND	2.0	ppb(v/v)	0.70
Hexachlorobutadiene	ND	4.0	ppb(v/v)	1.3
2-Hexanone	ND	10	ppb(v/v)	2.0
Methylene chloride	ND	2.0	ppb(v/v)	0.80
4-Methyl-2-pentanone (MIBK)	ND	10	ppb(v/v)	2.0
Styrene	ND	2.0	ppb(v/v)	1.0
1,1,2,2-Tetrachloroethane	ND	2.0	ppb(v/v)	1.0

(Continued on next page)

Sandia National Laboratories

Client Sample ID: 085812-002/MWL-DP8-30-SG

GC/MS Volatiles

Lot-Sample #...: E8D210164-004 Work Order #...: KLPCF1AC Matrix.....: AE

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Tetrachloroethene	ND	2.0	ppb(v/v)	1.0
Toluene	**2.4**	**2.0**	**ppb(v/v)**	**1.0**
1,2,4-Trichloro-benzene	ND	5.0	ppb(v/v)	2.5
1,1,1-Trichloroethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloroethane	ND	2.0	ppb(v/v)	1.0
Trichloroethene	ND	2.0	ppb(v/v)	1.0
Trichlorofluoromethane	ND	2.0	ppb(v/v)	1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	2.0	ppb(v/v)	1.0
1,2,4-Trimethylbenzene	ND	3.0	ppb(v/v)	1.3
1,3,5-Trimethylbenzene	ND	3.0	ppb(v/v)	1.1
Vinyl acetate	ND	10	ppb(v/v)	2.0
Vinyl chloride	ND	3.0	ppb(v/v)	1.5
m-Xylene & p-Xylene	ND	4.0	ppb(v/v)	2.0
o-Xylene	ND	2.0	ppb(v/v)	1.0

NOTE(S):

J Estimated result. Result is less than RL.

Sandia National Laboratories

Client Sample ID: 085812-002/MWL-DP8-30-SG

GC Volatiles

Lot-Sample #...:	E8D210164-004	**Work Order #...:**	KLPCF1AD	**Matrix.....:**	AE
Date Sampled...:	04/09/08	**Date Received..:**	04/21/08		
Prep Date.....:	04/23/08	**Analysis Date..:**	04/23/08		
Prep Batch #...:	8114474	**Analysis Time..:**	15:10		
Dilution Factor:	2.88				
Analyst ID.....:	999995	**Instrument ID..:**	GC8		
		Method.....:	ASTM D1946		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Methane	ND	0.00058	%(v/v)	0.00017

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

Sandia National Laboratories Payment Processing, MS 1385 P.O. Box 5130 Albuquerque, NM 87185-0154 Rita Kavanaugh	Work Order: Project: Project Number:	LRE0138 MWL Remediation 98045 02.02.02 / CF013-08	Received: Reported:	05/16/08 09:45 05/27/08 18:58

DATA QUALIFIERS AND DEFINITIONS

J	Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
ND	Not detected at the reporting limit (or method detection limit if shown)

APPENDIX E
Data Validation Reports for the 2008 Soil-Vapor Samples Collected at the Mixed Waste Landfill

Cross-reference spreadsheet linking analytical laboratory SDG Numbers (shown on Analytical Quality Associates, Inc. data validation reports for the soil-vapor samples) to the ER Sample ID names.			
AR/COC Number	ER Sample ID	Laboratory SDG Number	Sample Matrix
Data Sorted by AR/COC Number:			
611812	MWL-DP7-10-SG	E8D210164-001	SOIL-VAPOR
611812	MWL-DP7-30-SG	E8D210164-002	SOIL-VAPOR
611812	MWL-DP8-10-SG	E8D210164-003	SOIL-VAPOR
611812	MWL-DP8-30-SG	E8D210164-004	SOIL-VAPOR
611870	MWL-DP5-10-SG	LRE0127-01	SOIL-VAPOR
611870	MWL-DP5-10-SG-DUP	LRE0127-04	SOIL-VAPOR
611870	MWL-DP5-30-SG	LRE0127-02	SOIL-VAPOR
611870	MWL-DP5-30-SG-DUP	LRE0127-05	SOIL-VAPOR
611870	MWL-DP5-50-SG	LRE0127-03	SOIL-VAPOR
611870	MWL-DP5-50-SG-DUP	LRE0127-06	SOIL-VAPOR
611871	MWL-DP3-10-SG	LRE0138-01	SOIL-VAPOR
611871	MWL-DP3-30-SG	LRE0138-02	SOIL-VAPOR
611871	MWL-DP3-50-SG	LRE0138-03	SOIL-VAPOR
611874	MWL-DP2-10-SG	LRE0191-01	SOIL-VAPOR
611874	MWL-DP2-30-SG	LRE0191-02	SOIL-VAPOR
611874	MWL-DP2-50-SG	LRE0191-03	SOIL-VAPOR
611876	MWL-DP4-10-SG	LRE0192-01	SOIL-VAPOR
611876	MWL-DP4-30-SG	LRE0192-02	SOIL-VAPOR
611878	MWL-DP6-10-SG	LRE0205-01	SOIL-VAPOR
611878	MWL-DP6-10-SG-DUP	LRE0205-03	SOIL-VAPOR
611878	MWL-DP6-30-SG	LRE0205-02	SOIL-VAPOR
611878	MWL-DP6-30-SG-DUP	LRE0205-04	SOIL-VAPOR
611880	MWL-DP1-10-SG	LRE0228-01	SOIL-VAPOR
611880	MWL-DP1-30-SG	LRE0228-02	SOIL-VAPOR

Cross-reference spreadsheet linking analytical laboratory SDG Numbers (shown on			
Analytical Quality Associates, Inc. data validation reports for the soil-vapor samples)			
to the ER Sample ID names.			
AR/COC Number	ER Sample ID	Laboratory SDG Number	Sample Matrix
Data Sorted by Laboratory SDG Number:			
611812	MWL-DP7-10-SG	E8D210164-001	SOIL-VAPOR
611812	MWL-DP7-30-SG	E8D210164-002	SOIL-VAPOR
611812	MWL-DP8-10-SG	E8D210164-003	SOIL-VAPOR
611812	MWL-DP8-30-SG	E8D210164-004	SOIL-VAPOR
611870	MWL-DP5-10-SG	LRE0127-01	SOIL-VAPOR
611870	MWL-DP5-30-SG	LRE0127-02	SOIL-VAPOR
611870	MWL-DP5-50-SG	LRE0127-03	SOIL-VAPOR
611870	MWL-DP5-10-SG-DUP	LRE0127-04	SOIL-VAPOR
611870	MWL-DP5-30-SG-DUP	LRE0127-05	SOIL-VAPOR
611870	MWL-DP5-50-SG-DUP	LRE0127-06	SOIL-VAPOR
611871	MWL-DP3-10-SG	LRE0138-01	SOIL-VAPOR
611871	MWL-DP3-30-SG	LRE0138-02	SOIL-VAPOR
611871	MWL-DP3-50-SG	LRE0138-03	SOIL-VAPOR
611874	MWL-DP2-10-SG	LRE0191-01	SOIL-VAPOR
611874	MWL-DP2-30-SG	LRE0191-02	SOIL-VAPOR
611874	MWL-DP2-50-SG	LRE0191-03	SOIL-VAPOR
611876	MWL-DP4-10-SG	LRE0192-01	SOIL-VAPOR
611876	MWL-DP4-30-SG	LRE0192-02	SOIL-VAPOR
611878	MWL-DP6-10-SG	LRE0205-01	SOIL-VAPOR
611878	MWL-DP6-30-SG	LRE0205-02	SOIL-VAPOR
611878	MWL-DP6-10-SG-DUP	LRE0205-03	SOIL-VAPOR
611878	MWL-DP6-30-SG-DUP	LRE0205-04	SOIL-VAPOR
611880	MWL-DP1-10-SG	LRE0228-01	SOIL-VAPOR
611880	MWL-DP1-30-SG	LRE0228-02	SOIL-VAPOR
AR/COC = Analysis Request/Chain of Custody			
DP = Direct push			
DUP = Duplicate			
EB = Equipment blank			
ER = Environmental Restoration			
ID = Identification			
MWL = Mixed Waste Landfill			
S = Soil			
SDG = Sample Data Group			

Analytical Quality Associates, Inc.
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Albuquerque, NM 87123
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Email: minteer@aol.com

Memorandum

DATE: May 16, 2008

TO: File

FROM: David Schwent

SUBJECT: Organic GC/MS Data Review and Validation - SNL
Site: MWL Remediation
AR/COC: 611812
SDG: E8D210164
Laboratory: TestAmerica
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with approved procedures using method EPA-21 TO-14 (VOCs) and ASTM D1946 (methane). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the blanks.

Internal Standards (ISs)

All IS area and RT QC acceptance criteria were met.

Surrogates

No surrogate analyses were required by these methods.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD QC acceptance criteria were met. It should be noted that only 23 of the 49 target analytes were analyzed in the LCS/LCSD. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by these methods. The LCSD analysis was used as a measure laboratory precision. No sample data will be qualified as a result.

Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not requested.

Detection Limits/Dilutions

All detection limits were reported correctly. For methane, sample E8D210164-001 was diluted 3.28X, sample -002 was diluted 2.44X, sample -003 was diluted 3.16X and sample -004 was diluted 2.88X due to the nature of the matrix.

Other QC

No equipment blanks (EBs), field blanks (FBs) or field duplicates (FDs) were submitted on the AR/COC.

No other specific issues were identified which affect data quality.

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611812 **Organic**

Sample ID	VOCs (EPA-21 TO-14A):	Methane (ASTM D1946)
	All Acceptance criteria met. No sample data will be qualified.	All Acceptance criteria met. No sample data will be qualified.

Validated By: David Schwent **Date:** 05/16/08

Analytical Quality Associates, Inc.
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Albuquerque, NM 87123
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Memorandum

DATE: June 2, 2008

TO: File

FROM: David Schwent

SUBJECT: Organic GC/MS Data Review and Validation - SNL
Site: MWL Remediation
AR/COC: 611870
SDG (Work Order): LRE0127
Laboratory: TestAmerica
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with approved procedures using method EPA-21 TO-14 (VOCs). Problems were identified with the data package that result in the qualification of data.

Calibration: The continuing calibration verification (CCV) percent difference (%D) for 1,2,4-trimethylbenzene of Batch 8E17001 was >30% with positive bias. The associated result of sample LRE0127-05 was a detect and will be qualified "J+,C2."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met, except as noted above in the summary section and the following. The initial calibration percent relative standard deviation (%RSD) of vinyl acetate was >30% but <45%. However, all associated sample results were non-detects (NDs) and no other calibration QC acceptance criteria were exceeded. Therefore, no sample data will be qualified as a result. The CCV %Ds for chloromethane of Batches 8E16005 and 8E17001 were >30% but <45% with negative bias. However, all associated sample results were NDs and no other calibration QC acceptance

criteria were exceeded. Therefore, no sample data will be qualified as a result. The CCV %Ds for 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 1,2,4-trichlorobenzene of Batch 8E17001 were >30% with positive bias. However, all associated sample results, except the 1,2,4-trimethylbenzene result of sample LRE0127-05 (qualified above in the summary section), were NDs and will not be qualified. The CCV %D of 4-ethyltoluene was >30% with positive bias. However, the %D was above the QC acceptance limit by <1% and, based on professional judgment, no sample data will be qualified as a result.

Blanks

No target analytes were detected in the blanks.

Internal Standards (ISs)

All IS area and RT QC acceptance criteria were met.

Surrogates

No surrogate analyses were required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD QC acceptance criteria were met. It should be noted that only 16 of the 49 target analytes were analyzed in the LCS/LCSD. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analysis was used as a measure laboratory precision. No sample data will be qualified as a result.

Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not requested.

Detection Limits/Dilutions

All detection limits were reported correctly. Samples LRE0127-02, -04, and -05 were diluted 4.2X, 4.3X, and 4.4X, respectively, for tetrachloroethene due to high concentrations of the target analyte. No other samples required dilution.

Other QC

No equipment blanks (EBs) or field blanks (FBs) were submitted on the AR/COC. All relative percent differences (RPDs) of field duplicates (FDs) (samples LRE0127-05 and -06) were <30%. All RPDs of FD (sample -04) were <30%, except for the RPDs for the following target analytes: acetone (78%); 2-butanone (85%); chloroform (67%); dichlorodifluoromethane (50%); tetrachloroethene (58%); 1,1,1-trichloroethane (62%); trichloroethene (67%); trichlorofluoromethane (75%); and 1,1,2-trichloro-1,2,2-trifluoroethane (67%). No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified which affect data quality.

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Memorandum

DATE: June 2, 2008

TO: File

FROM: David Schwent

SUBJECT: Organic GC Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611870
SDG (Work Order): LRE0127
Laboratory: TestAmerica
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with accepted procedures using method ASTM D1946 (methane by GC/Flame Ionization Detector/Thermal Conductivity Detector). It should be noted that the AR/COC did not request the methane analysis, but the client directed the lab to perform it (see Corrective Action Report in the data package). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analysis was used as a measure laboratory precision. No sample data will be qualified as a result.

Target Compound Identification/Confirmation

No confirmation analysis was required for this method.

Detection Limits/Dilutions

All detection limits were reported correctly. Sample LRE0127-01 was diluted 2.3X, sample -02 was diluted 2.1X, sample -03 was diluted 2.2X, sample -04 was diluted 2.2X, sample -05 was diluted 2.2X, and sample -06 was diluted 2.1X due to the nature of the matrix.

Other QC

No equipment blanks (EBs) or field blanks (FBs) were submitted on the AR/COC. All field duplicate (FD) (samples LRE0127-04, -05, and -06) relative percent differences (RPDs) were <30%. No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues that affect data quality were identified.

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611870 **Organic**

Sample ID	VOCs (EPA-21 TO-14A):	95-63-6 (1,2,4-trimethylbenzene)	Methane (ASTM D1946)
085813-002 MWL-DP5-30-SG-DUP		J+,C2	All Acceptance criteria met. No sample data will be qualified.

Validated By: David Schmoll **Date:** 06/02/08

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Memorandum

DATE: June 5, 2008

TO: File

FROM: David Schwent

SUBJECT: Organic GC/MS Data Review and Validation - SNL
Site: MWL Remediation
AR/COC: 611871
SDG (Work Order): LRE0138
Laboratory: TestAmerica
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with approved procedures using method EPA-21 TO-14 (VOCs). Problems were identified with the data package that result in the qualification of data.

Calibration: The continuing calibration verification (CCV) percent difference (%D) of 2-butanone was >30% with positive bias. All associated sample results were detects and will be qualified "J+,C2."

Calibration: The CCV %D of 1,2,4-trimethylbenzene was >30% with positive bias. All associated sample results were detects and will be qualified "J+,C2."

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met, except as noted above in the summary section and the following. The initial calibration percent relative standard deviation (%RSD) of vinyl acetate was >30% but <45%. However, all associated sample results were non-detects (NDs) and no other calibration QC acceptance criteria were exceeded. Therefore, no sample data will be qualified as a

result. The CCV %D of 1,2,4-trichlorobenzene was >30% with positive bias. However, all associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks.

Internal Standards (ISs)

All IS area and RT QC acceptance criteria were met.

Surrogates

No surrogate analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD QC acceptance criteria were met. It should be noted that only 16 of the 49 target analytes were analyzed in the LCS/LCSD. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analysis was used as a measure laboratory precision. No sample data will be qualified as a result.

Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not requested.

Detection Limits/Dilutions

All detection limits were reported correctly. Samples LRE0138-02 and -03 were diluted 6.9X and 6.4X, respectively, for trichlorofluoromethane due to high concentrations of the target analyte. No other samples required dilution.

Other QC

No equipment blanks (EBs), field blanks (FBs), or field duplicates (FDs) were submitted on the AR/COC.

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert, Level I Peer Review, 06/05/08

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Memorandum

DATE: June 5, 2008

TO: File

FROM: David Schwent

SUBJECT: Organic GC Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611871
SDG (Work Order): LRE0138
Laboratory: TestAmerica
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with accepted procedures using method ASTM D1946 (methane by GC/Flame Ionization Detector/Thermal Conductivity Detector). It should be noted that the AR/COC did not request the methane analysis, but the client directed the lab to perform it (see Corrective Action Report in the data package). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analysis was used as a measure laboratory precision. No sample data will be qualified as a result.

Target Compound Identification/Confirmation

No confirmation analysis was required for this method.

Detection Limits/Dilutions

All detection limits were reported correctly. Sample LRE0138-01 was diluted 3.2X, sample -02 was diluted 3.1X, and sample -03 was diluted 2.6X due to the nature of the matrix.

Other QC

No equipment blanks (EBs), field blanks (FBs), or field duplicates (FDs) were submitted on the AR/COC.

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert, Level I Peer Review, 06/05/08

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611871 **Organic**

Sample ID	EPA-21 TO-14A (VOCs):	78-93-3 (2-butanone)	95-63-6 (1,2,4-trimethylbenzene)	ASTM D1946 (methane)
085807-001 MWL-DP3-10-SG		J+,C2	J+,C2	All Acceptance criteria met. No sample data will be qualified.
085807-002 MWL-DP3-30-SG		J+,C2	J+,C2	
085807-003 MWL-DP3-50-SG		J+,C2	J+,C2	

Validated By: David Schwartz **Date:** 06/05/08

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Memorandum

Date: June 3, 2008

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL Remediation
COC: 611874
SDG (Work Order): LRE0191
Laboratory: TestAmerica Laboratories, Inc. - Santa Ana, CA
Project/Task No: 98045.02.02.02
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA TO-14A (VOCs). Data were reported for all required analytes. No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding time and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met except as follows. The continuing calibration verification (CCV) percent difference (%D) for chloromethane was >30% but ≤45% with a negative bias. All associated sample results were non-detects and no other calibration infractions occurred for this analyte. Therefore, the associated sample results will not be qualified.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analyses were required by this method.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCS/LCSD is used to assess accuracy and precision.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS/LCSD analyses met all QC acceptance criteria. It should be noted that only 16 of the 49 target analytes were analyzed in the LCS/LCSD. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TICs were not requested.

Other QC

No equipment blanks (EBs), field blanks (FBs), or field duplicate pairs were submitted on the AR/COC.

No other specific issues that affect data quality were identified.

Reviewed: David Schwent Level: I 06/04/08

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Memorandum

DATE: June 3, 2008

TO: File

FROM: David Schwent

SUBJECT: GC Organic Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611874
SDG (Work Order): LRE0191
Laboratory: TestAmerica Laboratories, Inc. - Santa Ana, CA
Project/Task No: 98045.02.02.02
Analysis: Methane

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Three samples were prepared and analyzed with accepted procedures using method ASTM D1946 (methane by GC/Flame Ionization Detector/Thermal Conductivity Detector). It should be noted that the methane analysis was not requested on the AR/COC, but was added by the laboratory in accordance with client instructions (see Corrective Action Report in the data package). No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analyses were required by this method.

Sample Findings Summary

Site: MWL Remediation

AR/COC: 611874

Data Type: Organics

VOCs (TO-14A) and Methane analyses met QC acceptance criteria. No data should be qualified.

Validated By:

Kevin A Lambert

Kevin A. Lambert

Date: 06/03/08

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Memorandum

Date: June 3, 2008

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL Remediation
COC: 611876
SDG (Work Order): LRE0192
Laboratory: TestAmerica Laboratories, Inc. - Santa Ana, CA
Project/Task No: 98045.02.02.02
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 2.

Summary

Two samples were prepared and analyzed with accepted procedures using method EPA TO-14A (VOCs). Data were reported for all required analytes. No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding time and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met except as follows. The continuing calibration verification (CCV) percent difference (%D) for chloromethane was >30% but ≤45% with a negative bias. All associated sample results were non-detects and no other calibration infractions occurred for this analyte. Therefore, the associated sample results will not be qualified.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analyses were required by this method.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCS/LCSD is used to assess accuracy and precision.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS/LCSD analyses met all QC acceptance criteria. It should be noted that only 16 of the 49 target analytes were analyzed in the LCS/LCSD. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TICs were not requested.

Other QC

No equipment blanks (EBs), field blanks (FBs), or field duplicate pairs were submitted on the AR/COC.

No other specific issues that affect data quality were identified.

Reviewed: David Schwent Level: I 06/04/08

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Memorandum

DATE: June 3, 2008

TO: File

FROM: David Schwent

SUBJECT: GC Organic Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611876
SDG (Work Order): LRE0192
Laboratory: TestAmerica Laboratories, Inc. - Santa Ana, CA
Project/Task No: 98045.02.02.02
Analysis: Methane

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Two samples were prepared and analyzed with accepted procedures using method ASTM D1946 (methane by GC/Flame Ionization Detector/Thermal Conductivity Detector). It should be noted that the methane analysis was not requested on the AR/COC, but was added by the laboratory in accordance with client instructions (see Corrective Action Report in the data package). No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analyses were required by this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCS/LCSD is used to assess accuracy and precision.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS/LCSD analyses met all QC acceptance criteria.

Target Compound Identification/Confirmation

No confirmation analysis was required for this method.

Detection Limits/Dilutions

All detection limits were reported correctly. Sample LRE0192-01 was diluted 3.1X and sample LRE0192-02 was diluted 2.8X due to the nature of the matrix.

Other QC

No equipment blanks (EBs), field blanks (FBs), or field duplicate pairs were submitted on the AR/COC.

No other specific issues that affect data quality were identified.

Reviewed: David Schwent Level: I 06/04/08

Sample Findings Summary

Site: MWL Remediation

AR/COC: 611876

Data Type: Organics

VOCs (TO-14A) and Methane analyses met QC acceptance criteria. No data should be qualified.

Validated By:

Kevin A Lambert

Kevin A. Lambert

Date: 06/03/08

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Memorandum

DATE: June 5, 2008

TO: File

FROM: David Schwent

SUBJECT: Organic GC/MS Data Review and Validation - SNL
Site: MWL Remediation
AR/COC: 611878
SDG (Work Order): LRE0205
Laboratory: TestAmerica
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with approved procedures using method EPA-21 TO-14 (VOCs). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times/Preservation

All samples were analyzed within the prescribed holding times and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met, except the following. The continuing calibration verification (CCV) percent differences (%Ds) of 1,2,4-trimethylbenzene, hexachlorobutadiene, and 1,2,4-trichlorobenzene were >30% with positive bias. However, all associated sample results were non-detects (NDs) and will not be qualified.

Blanks

No target analytes were detected in the blanks.

Internal Standards (ISs)

All IS area and RT QC acceptance criteria were met.

Surrogates

No surrogate analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD QC acceptance criteria were met. It should be noted that only 16 of the 49 target analytes were analyzed in the LCS/LCSD. No sample data will be qualified as a result.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analysis was used as a measure laboratory precision. No sample data will be qualified as a result.

Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not requested.

Detection Limits/Dilutions

All detection limits were reported correctly. Samples LRE0205-02 and -04 were diluted 3.1X for all target analytes. No other samples required dilution.

Other QC

No equipment blanks (EBs) or field blanks (FBs) were submitted on the AR/COC. All relative percent differences (RPDs) of field duplicate (FD) (sample LRE0205-03 were <30%. All RPDs of FD (sample -04) were <30%, except for the RPDs for the following target analytes: tetrachloroethene (197%); 1,1,1-trichloroethane (80%); trichloroethene (164%); and 1,1,2-trichloro-1,2,2-trifluoroethane (34%). No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert, Level I Peer Review, 06/06/08

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Memorandum

DATE: June 5, 2008

TO: File

FROM: David Schwent

SUBJECT: Organic GC Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611878
SDG (Work Order): LRE0205
Laboratory: TestAmerica
Project/Task No: 98045.02.02.02

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

All samples were prepared and analyzed with accepted procedures using method ASTM D1946 (methane by GC/Flame Ionization Detector/Thermal Conductivity Detector). No problems were identified with the data package that result in the qualification of data.

Data are acceptable. QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analysis was required by this method.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

All LCS/LCSD QC acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analysis was used as a measure laboratory precision. No sample data will be qualified as a result.

Target Compound Identification/Confirmation

No confirmation analysis was required for this method.

Detection Limits/Dilutions

All detection limits were reported correctly. Sample LRE0205-01 was diluted 3.2X, sample -02 was diluted 3.1X, sample -03 was diluted 2.8X, and sample -04 was diluted 3.1X due to the nature of the matrix.

Other QC

No equipment blanks (EBs) or field blanks (FBs) were submitted on the AR/COC. All relative percent differences (RPDs) of the field duplicates (FDs) (samples LRE0205-03 and -04) were <30%. No QC acceptance criteria for the evaluation of FDs are currently in place.

No other specific issues were identified that affect data quality.

Reviewed by: Kevin A. Lambert, Level I Peer Review, 06/06/08

Sample Findings Summary

Site: MWL Remediation **AR/COC:** 611878 **Organic**

Sample ID	EPA-21 TO-14A (VOCs):	ASTM D1946 (methane):
	All Acceptance criteria met. No sample data will be qualified.	All Acceptance criteria met. No sample data will be qualified.

Validated By: David Schmont **Date:** 06/05/08

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Memorandum

Date: June 10, 2008

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: MWL Remediation
COC: 611880
SDG (Work Order): LRE0228
Laboratory: TestAmerica Laboratories, Inc. - Santa Ana, CA
Project/Task No: 98045.02.02.02
Analysis: VOCs

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. Data are evaluated using SNL/NM SMO AOP 00-03 Rev 2.

Summary

Two samples were prepared and analyzed with accepted procedures using method EPA TO-14A (VOCs). Data were reported for all required analytes. No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding time and properly preserved.

Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration QC acceptance criteria were met except as follows. The continuing calibration verification (CCV) percent difference (%D) for chloromethane was >30% but ≤45% with a negative bias. All associated sample results were non-detects and no other calibration infractions occurred for this analyte. Therefore, the associated sample results will not be qualified.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analyses were required by this method.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCS/LCSD is used to assess accuracy and precision.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS/LCSD analyses met all QC acceptance criteria. It should be noted that only 16 of the 49 target analytes were analyzed in the LCS/LCSD. No sample data will be qualified as a result.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted.

Tentatively Identified Compounds (TICs)

TICs were not requested.

Other QC

No equipment blanks (EBs), field blanks (FBs), or field duplicates (FDs) were submitted on the AR/COC.

No other specific issues were identified that affect data quality.

Reviewed: David Schwent ..... Level: I 06/10/08

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Memorandum

DATE: June 10, 2008

TO: File

FROM: Kevin Lambert

SUBJECT: GC Organic Data Review and Validation – SNL
Site: MWL Remediation
AR/COC: 611880
SDG (Work Order): LRE0228
Laboratory: TestAmerica Laboratories, Inc. - Santa Ana, CA
Project/Task No: 98045.02.02.02
Analysis: Methane

See the attached Data Validation Worksheets for supporting documentation on the data review and validation. This validation was performed according to SNL/NM ER Project AOP 00-03 Rev 2.

Summary

Two samples were prepared and analyzed with accepted procedures using method ASTM D1946 (methane by GC/Flame Ionization Detector/Thermal Conductivity Detector). No problems were identified with the data package that result in the qualification of data.

Data are acceptable and reported QC measures appear to be adequate. The following sections discuss the data review and validation.

Holding Times and Preservation

The samples were analyzed within the prescribed holding times and properly preserved.

Calibration

All initial and continuing calibration QC acceptance criteria were met.

Blanks

No target analytes were detected in the method blank.

Surrogates

No surrogate analyses were required by this method.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCS/LCSD is used to assess accuracy and precision.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

The LCS/LCSD analyses met all QC acceptance criteria.

Target Compound Identification/Confirmation

No confirmation analysis was required for this method.

Detection Limits/Dilutions

All detection limits were reported correctly. Sample LRE0228-01 was diluted 2.2X and sample -02 was diluted 2.6X due to the nature of the matrix.

Other QC

No equipment blanks (EBs), field blanks (FBs), or field duplicate (FDs) were submitted on the AR/COC.

No other specific issues were identified that affect data quality.

Reviewed: David Schwent Level: I 06/10/08

Sample Findings Summary

Site: MWL Remediation

AR/COC: 611880

Data Type: Organics

VOCs (TO-14A) and Methane analyses met QC acceptance criteria. No data should be qualified.

Validated By:

Kevin A Lambert

Kevin A. Lambert

Date: 06/10/08

6.1 Data Qualifier Definitions

Data qualifiers are commonly used during the validation process to classify sample data as to their conformance to QC requirements. For the purposes of this procedure, the following code letters and associated definitions are provided:

BD	(below detection limit) - Used in radiochemistry to identify results that are not statistically different from zero.
J	The associated value is an estimated quantity.
J+	The associated numerical value is an estimated quantity with a suspected positive bias.
J-	The associated numerical value is an estimated quantity with a suspected negative bias.
N	Presumptive evidence of the presence of the material.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
NJ+	Presumptive evidence of the presence of the material at an estimated quantity with a suspected positive bias.
NJ-	Presumptive evidence of the presence of the material at an estimated quantity with a suspected negative bias.
R	The data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.
U	The analyte was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
UJ	The analyte was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Datum is unqualified if the quality parameters indicate the method was appropriate and that the reported result reflects the true value within the expected analytical uncertainty.

9.0 REASON CODES

Programs may require that general validation codes be included in their computer databases or EDDs. The following codes are the default codes used when this is required.

H1 - Holding time exceeded for sample analysis
H2 - Holding time exceeded for sample extraction
H3 - Holding time exceeded by greater than twice the specified holding time

TP1 - Sample improperly preserved
TP2 - Sample not preserved
TP3 - Sample not maintained at required temperature
TP4 - Required sample or extract clean up not performed
TP5 - Sample received unpreserved and preserved at the laboratory

I1 - Initial calibration not reported
I2 - Initial calibration not independently verified
I3 - Slope r^2 or RF %RSD criteria not met
I4 - Minimum RF / Slope not met
I5 - Intercept too large
I6 - Insufficient number of calibration standards used

C1 - Continuing calibration frequency not met
C2 - Continuing calibration %D failed high
C3 - Continuing calibration %D failed low

B - Method blank contamination at concentration greater than PQL
B1 - Trip blank contamination at concentration greater than PQL
B2 - Field/equipment blank contamination at concentration greater than PQL
B3 - Calibration blank contamination at concentration greater than PQL
B4 - Negative value for calibration blank - absolute value greater than the MDL
B5 - Negative value for method blank - absolute value greater than the MDL
B6 - Negative value for field/equipment/trip blank - absolute value greater than the MDL
B7 - Method blank contamination at activity greater than the MDA
B8 - Method blank frequency not met
B9 - Instrument or calibration blank frequency not met

IS1 - Internal standard / tracer recovery failed high
IS2 - Internal standard / tracer recovery failed low but greater than 10%
IS3 - Internal standard / tracer recovery failed low and less than 10%

S1 - Surrogate(s) failed high
S2 - Surrogate(s) failed low
S3 - Multiple random surrogate failures

FR1 - Result exceeds calibration range
FR2 - No result reported - sample lost or damaged
FR3 - Result is less than the MDA / MDL
FR4 - Negative result - absolute value greater than the MDA/MDL
FR5 - Retention time criteria not met
FR6 - Ion mass ratio criteria not met

MS1 - Matrix spike not analyzed or not analyzed on the client's sample
MS2 - Matrix spike analyte(s) recovery failed high
MS3 - Matrix spike analyte(s) recovery failed low
MS4 - Matrix spike analytė(s) recovery failed both high and low
MS5 - MS/MSD relative percent difference failed

RP1 - Replicate not analyzed or not analyzed on the client's sample
RP2 - Replicate relative percent difference failed

L1 - Laboratory control sample frequency not met
L2 - Laboratory control sample analyte(s) recovery failed high
L3 - Laboratory control sample analyte(s) recovery failed low
L4 - Laboratory control sample analyte(s) recovery failed both high and low
L5 - LCS/LCSD relative percent difference failed

DL1 - Reporting limit verification frequency not met
DL2 - Reporting limit verification percent recovery failed high
DL3 - Reporting limit verification percent recovery failed low

CK1 - Interference check sample frequency not met
CK2 - Interference check sample analyte(s) failed high
CK3 - Interference check sample analyte(s) failed low

D1 - Serial dilution failed percent recovery
D2 - Inappropriate initial dilution

V1 - Conformation analysis not done
V2 - Conformation RPD exceeds criteria

X1 - General data quality is suspect - see report
X2 - Analysis failed to meet method requirements - see report
X3 - Required QC documentation missing