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U. S. Department of Energy
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Dear Mr. Beausoleil:

Subject: ***Submittal of Chemical Waste Landfill (CWL) Annual Post-Closure Care Report, Chemical Waste Landfill Post-Closure Care Permit (PCCP) for Sandia National Laboratories/New Mexico (SNL/NM), Environmental Protection Agency Identification Number NM5890110518***

The CWL Annual Post-Closure Care Report is being provided to the Department of Energy (DOE) for submittal to the New Mexico Environment Department (NMED). This submittal is required by Part 2, Section 2.6.3, of the CWL PCCP and includes information for activities conducted at the CWL during Calendar Year 2012. . The report and supporting documentation satisfy requirements listed in Permit Attachment 1, Sections 1.9 and 1.12.

I have signed the attached certification statement as the Operator at SNL/NM, and it is also to be signed by you as the Owner at the DOE. Please transmit this report to the NMED by March 31, 2013. If you have any questions regarding the report enclosed with this letter, please contact Terry Cooper, Senior Manager, at (505) 284-1831/twcoope@sandia.gov or Pamela Puissant, Manager, at (505) 844-3185/pmpuiss@sandia.gov.

Sincerely,

Michael W. Hazen,
Vice President

Enclosures:

1. Certification Statement: Chemical Waste Landfill Annual Post-Closure Care Report for Sandia National Laboratories/New Mexico (SNL/NM).
2. Sandia National Laboratories, Permit NM5890110518, Chemical Waste Landfill Annual Post-Closure Care Report for Sandia National Laboratories/New Mexico (SNL/NM).
3. Sandia National Laboratories, Permit NM5890110518, Chemical Waste Landfill Annual Post-Closure Care Report for Sandia National Laboratories/New Mexico (SNL/NM), Compact Disc.

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Chemical Waste Landfill Annual Post-Closure Care Report, Chemical Waste Landfill Post-Closure Care Permit for Sandia National Laboratories/New Mexico, Environmental Protection Agency Identification Number NM5890110518

CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

_____ _____

Michael W. Hazen, Vice-President
Sandia Corporation
Albuquerque, New Mexico
Operator

Date signed

_____ _____

Geoffrey L. Beausoleil, Manager
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National Nuclear Security Administration
Sandia Field Office
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Date signed

Sandia National Laboratories

CHEMICAL WASTE LANDFILL
ANNUAL POST-CLOSURE CARE REPORT
CALENDAR YEAR 2012

SANDIA NATIONAL LABORATORIES, NEW MEXICO
LONG-TERM STEWARDSHIP
CHEMICAL WASTE LANDFILL POST-CLOSURE CARE PERMIT

MARCH 2013

U.S. DEPARTMENT OF ENERGY

United States Department of Energy
Sandia Field Office

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ANNUAL CHEMICAL WASTE LANDFILL POST-CLOSURE CARE REPORT CALENDAR YEAR 2012

Facility: Chemical Waste Landfill

Location: Sandia National Laboratories
Albuquerque, New Mexico

EPA ID No.: NM5890110518

Permit Basis: Chemical Waste Landfill Post-Closure Care Permit, issued October 15, 2009, effective June 2, 2011, and subsequently modified.

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Annex D Chemical Waste Landfill CY 2012 Biology Report

ACRONYMS AND ABBREVIATIONS

AOP	administrative operating procedure
bgs	below ground surface
CAMU	Corrective Action Management Unit
CFR	Code of Federal Regulations
CWL	Chemical Waste Landfill
CY	Calendar Year
DO	dissolved oxygen
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ET	Evapotranspirative
FOP	field operating procedure
gpm	gallons per minute
KAFB	Kirtland Air Force Base
LCL	lower confidence limit
LE	Landfill Excavation
MDL	method detection limit
µg/L	micrograms per liter
mg/L	milligrams per liter
NMED	New Mexico Environment Department
NTU	nephelometric turbidity units
OB	Oversight Bureau
OLS	Ordinary least squares
ORP	oxidation-reduction potential
P&A	plug and abandonment
PCCP	Post-Closure Care Permit
pH	Potential of hydrogen (negative logarithm of the hydrogen ion concentration)
PQL	practical quantitation limit
QC	quality control
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SC	specific conductance
SNL/NM	Sandia National Laboratories, New Mexico
TCE	trichloroethene (also trichloroethylene)
UCL	upper confidence limit
VCM	Voluntary Corrective Measure
VE	Vapor Extraction
VOC	volatile organic compound

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1.0 INTRODUCTION

Sandia National Laboratories (SNL) is a multi-purpose engineering and science laboratory owned by the U.S. Department of Energy/National Nuclear Security Administration (DOE) and operated by Sandia Corporation (Sandia), a subsidiary of Lockheed Martin.

The Chemical Waste Landfill (CWL) at SNL/New Mexico (SNL/NM) is a remediated interim status landfill that has undergone closure in accordance with Title 20, Chapter 4, Part 1 of the New Mexico Administrative Code (20.4.1.600 NMAC), incorporating Title 40, Code of Federal Regulations, Part 265, (40 CFR 265) Subpart G and the CWL Final Closure Plan (Closure Plan) (SNL/NM December 1992 and subsequent revisions). The CWL Post-Closure Care Permit (PCCP) (NMED October 2009), which became effective June 2, 2011 (Kieling June 2011) and has subsequently been modified, defines all post-closure requirements. Table 1-1 summarizes the modification history of the PCCP through 2012.

Table 1-1
Chemical Waste Landfill Post-Closure Care Permit Modification History

Date of Modification[a]	Affected Parts of PCCP	Description of Modification
September 26, 2011	Attachment 6 (Contingency Plan)	Updates to emergency response agreements, equipment, emergency coordinators, and inclusion of an evacuation route and assembly point figure and updated figure list.
November 16, 2011	Attachment 6 (Contingency Plan)	Correction of a typographical error in the telephone number for an emergency coordinator.
February 20, 2012	Attachments 1-5	Allowing use of equivalent soil-gas passive venting devices and alternate method for analysis of soil-gas samples; clarification of cover inspection and repair specifications; updates to three figures for well locations; revisions to groundwater purging and stability requirements; inclusion of well completion diagrams for the four groundwater monitoring wells, updates to the list of operating procedures; clarification of soil-gas purging requirements; format updates to inspection forms; and correction of typographical errors

Notes:
[a]Date represents the effective date of modification

1.1 Purpose and Scope

The purpose of this CWL Annual Post-Closure Care Report is to document monitoring, inspection, maintenance, and repair activities conducted during calendar year (CY) 2012 in accordance with Attachment 1 of the CWL PCCP (NMED October 2009 and subsequent revisions). This annual report documents PCCP activities conducted from January through December 2012 and fulfills the CWL PCCP requirement for annual reporting to the New Mexico Environment Department (NMED).

The CWL PCCP requires monitoring and inspection activities that must be documented and reported for each CY. Monitoring activities include semi-annual groundwater monitoring for specific volatile organic compounds (VOCs) and metals, and annual vadose zone soil-gas monitoring for specific VOCs. Inspection activities are required for the following components: final cover (vegetation and surface); storm-water diversion structures; monitoring networks and sampling equipment (groundwater and soil-gas); and security fence, locks, gates, signage, and survey monuments. The CWL final cover is a vegetative at-grade soil cover, or evapotranspirative (ET) cover.

The scope of this report includes documentation of all monitoring and inspection activities for CY 2012, the first full CY of activities under the CWL PCCP. Monitoring and inspections performed during this time period were:

- Two semi-annual groundwater monitoring events.
- One annual soil-gas monitoring event.
- Two semi-annual inspections of the groundwater monitoring network and sampling equipment.
- One annual inspection of the soil-gas monitoring network and sampling equipment.
- One annual inspection of final cover vegetation (i.e., biology inspection of the ET Cover).
- Four quarterly inspections of the final cover surface (i.e., physical features excluding the vegetation covered in the biology inspection), storm-water diversion structures, fence, locks, gates, signs, and survey monuments.

This CY 2012 report is organized as follows:

- Chapter 1 presents background information, purpose and scope, and report organization.
- Chapter 2 provides a description of the final cover system, compliance monitoring system (groundwater and soil-gas), storm-water diversion structures, and security fence (fence, locks, gate, signage, and survey monuments).
- Chapter 3 presents monitoring and inspection, maintenance, and repair requirements.
- Chapter 4 presents groundwater monitoring activities and results.
- Chapter 5 presents soil-gas monitoring activities and results.
- Chapter 6 presents inspection, maintenance, and repair activities and results.
- Chapter 7 summarizes regulatory activities.

- Chapter 8 presents a general summary and conclusions for the 2012 reporting period.
- Chapter 9 lists the references cited in this report.

Annexes are provided that include CY 2012 supporting information as follows:

- Annex A – Groundwater Monitoring Forms and Reports
- Annex B – Soil-Gas Monitoring Forms and Reports
- Annex C – Post-Closure Inspection Forms
- Annex D – Chemical Waste Landfill Biology Report

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2.0 CHEMICAL WASTE LANDFILL POST-CLOSURE CARE CONDITIONS

The CWL is a 1.9-acre remediated interim status landfill located in the southeastern corner of SNL/NM Technical Area III (Figures 2-1 and 2-2) undergoing post-closure care in accordance with the CWL PCCP (NMED October 2009 and subsequent revisions). From 1962 until 1981, the CWL was used for the disposal of chemical and solid waste generated by SNL research activities. Additionally, a small amount of radioactive waste was disposed of during the operational years. Disposal of liquid waste in unlined pits and trenches ended in 1981, and after 1982 all liquid waste disposal was terminated. From 1982 through 1985, only solid waste was disposed of at the CWL, and after 1985 all waste disposal ended. The CWL was also used as a hazardous waste drum-storage facility from 1981 to 1989. A summary of the CWL disposal history is presented in the Closure Plan (SNL/NM December 1992) along with a waste inventory based upon available disposal records and information.

Two voluntary corrective measures (VCMs) were conducted at the CWL. The CWL Landfill Excavation (LE) Voluntary Corrective Measure (VCM) was conducted from September 1998 through February 2002. Soil-vapor extraction was also conducted as a VCM from 1997 through 1998 prior to the LE VCM to reduce the concentrations of VOC soil vapor in the vadose zone, control the VOC soil-gas plume, and to reduce groundwater trichloroethene (TCE) concentrations below the regulatory standard of 5 micrograms per liter (µg/L). All former disposal areas were excavated during the LE VCM and groundwater TCE concentrations have been below the regulatory standard since completion of the Vapor Extraction (VE) VCM in 1998. Approximately 52,000 cubic yards of contaminated soil and debris were removed during the LE VCM.

Additional information on CWL current conditions can be found in the CWL Final RCRA Closure Report for the CWL (SNL/NM, September 2010), the CWL PCCP (NMED, October 2009 and subsequent revisions), and the CWL Corrective Measures Study Report (SNL/NM, December 2004). Detailed information on residual soil contamination at the CWL can be found in Part 3, Section 3.1 and Table 3-1 of the CWL PCCP (NMED October 2009 and subsequent revisions).

The following sections summarize information on the physical characteristics of the CWL, including the final cover system, compliance monitoring system, storm-water diversion structures, and security fence. More detailed information is provided in the CWL PCCP Attachment 1, Section 1.3 through 1.6, respectively.

2.1 Final Cover System

The CWL final cover is a centrally crowned “at-grade” ET Cover designed to minimize infiltration of moisture into the former disposal area and to minimize long-term maintenance consistent with 40 CFR 264.111(a). The crown of the cover slopes to the north and south at a 1-percent grade, and east to west at a 3-percent grade to minimize erosion losses and control run-on/run-off. The ET Cover consists of two discrete layers; a 3-foot-thick native soil layer installed from 4 feet below ground surface (bgs) to 1 foot bgs, and a topsoil layer (approximately 1.5-feet thick) installed from 1 foot bgs to the local grade. The topsoil layer was revegetated with

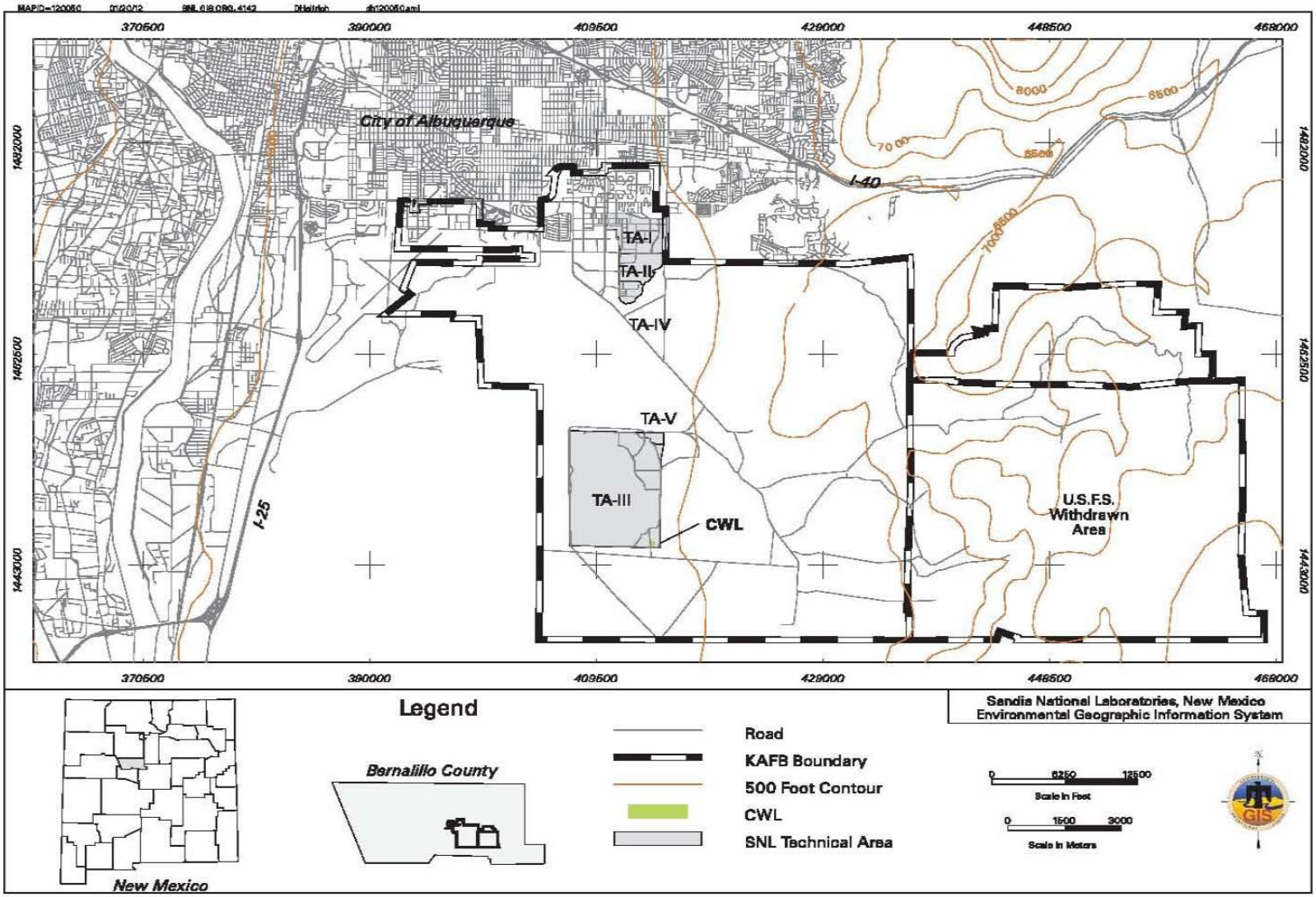

Figure 2-1
Location of the Chemical Waste Landfill with respect to Kirtland Air Force Base and the City of Albuquerque

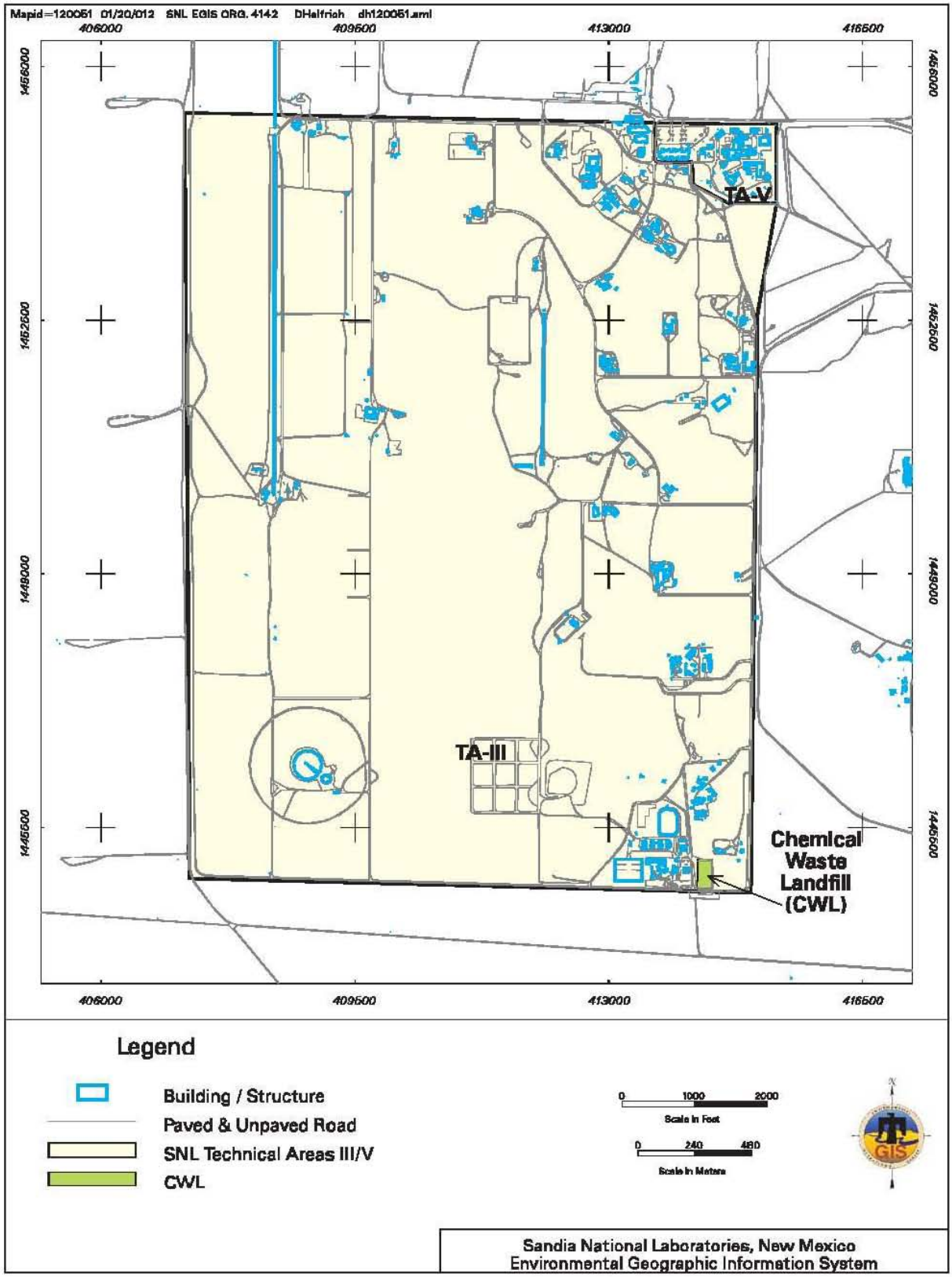

Figure 2-2
Location of the Chemical Waste Landfill within Technical Area III

native plants according to the specifications contained in the Remedial Action Proposal, Annex I, CMS Report (SNL/NM December 2004). Figure 2-3 shows a conceptual schematic profile of the ET Cover and Figure 2-4 shows the central crown and surface drainage patterns.

2.2 Compliance Monitoring System

The compliance monitoring system includes a groundwater monitoring well network and a soil-gas-monitoring well network, which are described in the following sections.

2.2.1 Groundwater Monitoring Network

Groundwater monitoring is performed to ensure the protection of groundwater during the compliance and post-closure care periods. The CWL groundwater monitoring network consists of four NMED-approved monitoring wells that monitor the uppermost part of the regional aquifer in accordance with the requirements of 40 CFR 264.99. The four wells are described below and their locations are shown in Figure 2-4.

- One hydraulically upgradient background well – CWL-BW5, and
- Three hydraulically downgradient compliance wells – CWL-MW9, CWL-MW10, and CWL-MWL11.

Well-completion diagrams for all of the groundwater monitoring wells are provided in Attachment 2 of the CWL PCCP (NMED October 2009 and subsequent revisions).

2.2.2 Soil-Gas Monitoring Network

The soil-gas monitoring network is designed to ensure the protection of groundwater quality by providing early detection data to determine whether the VOC soil-gas plume has the potential to contaminate groundwater at concentrations exceeding regulatory concentration limits. The five multiport wells, shown in Figure 2-4, are designed to monitor the vadose zone at various depths beneath the CWL in the area most contaminated by past disposal of organic liquid waste. The wells and their depth-specific sampling ports are as follows:

- D1 – Sampling Ports at 100, 160, 240, 350, and 470 feet bgs (5 ports)
- D2 – Sampling Ports at 120, 240, 350, 440, and 470 feet bgs (5 ports)
- D3 – Sampling Ports at 120, 170, 350, 440, and 480 feet bgs (5 ports)
- U11 – Sampling Ports at 40, 80, and 120 feet bgs (3 ports)
- U12 – Sampling Ports at 36, 76, and 136 feet bgs (3 ports)

Well-completion diagrams for all of the soil-gas monitoring wells are provided in Attachment 3 of the CWL PCCP (NMED October 2009 and subsequent revisions).

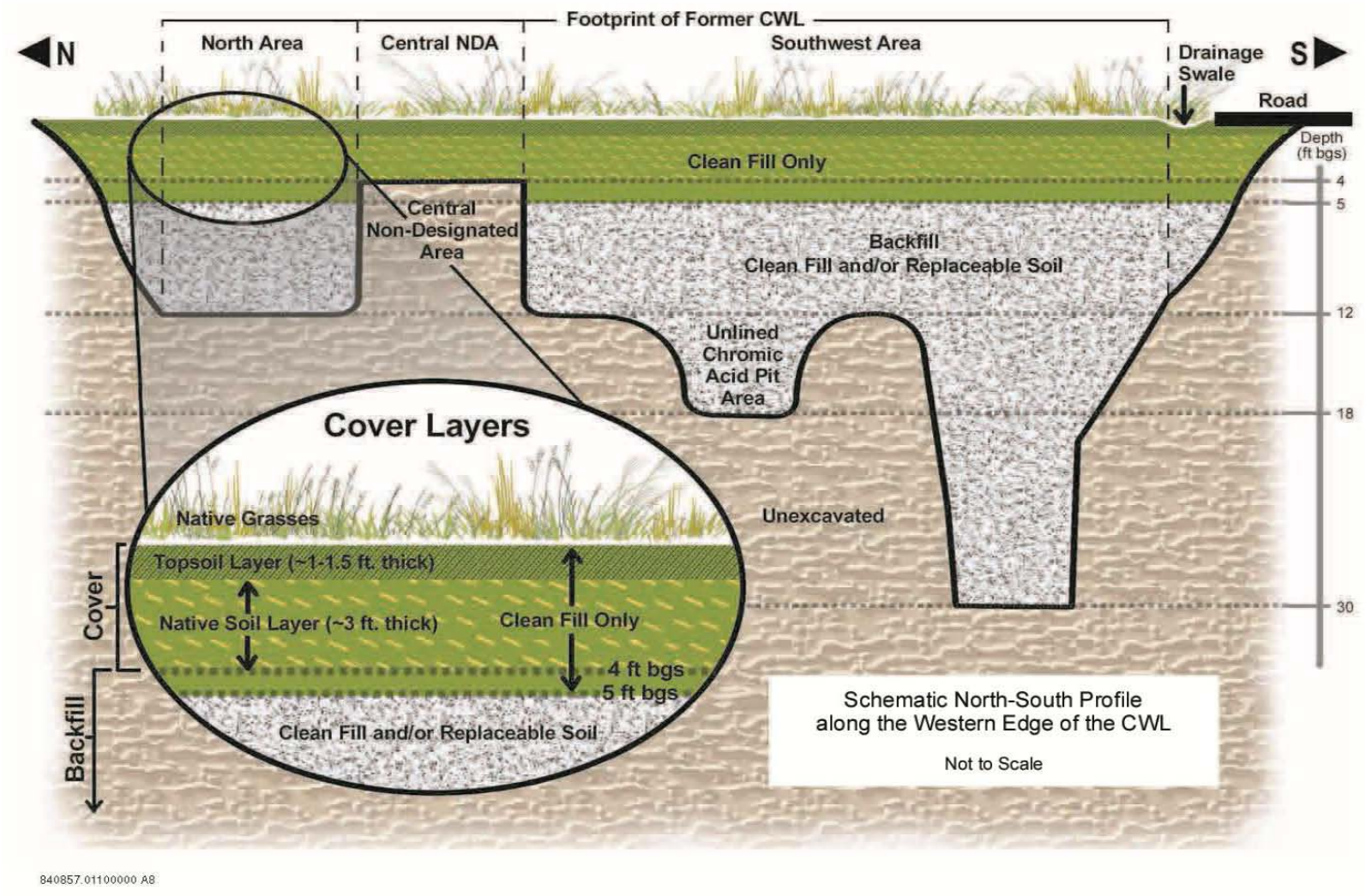

Figure 2-3
Schematic Profile of the Chemical Waste Landfill Evapotranspirative Cover

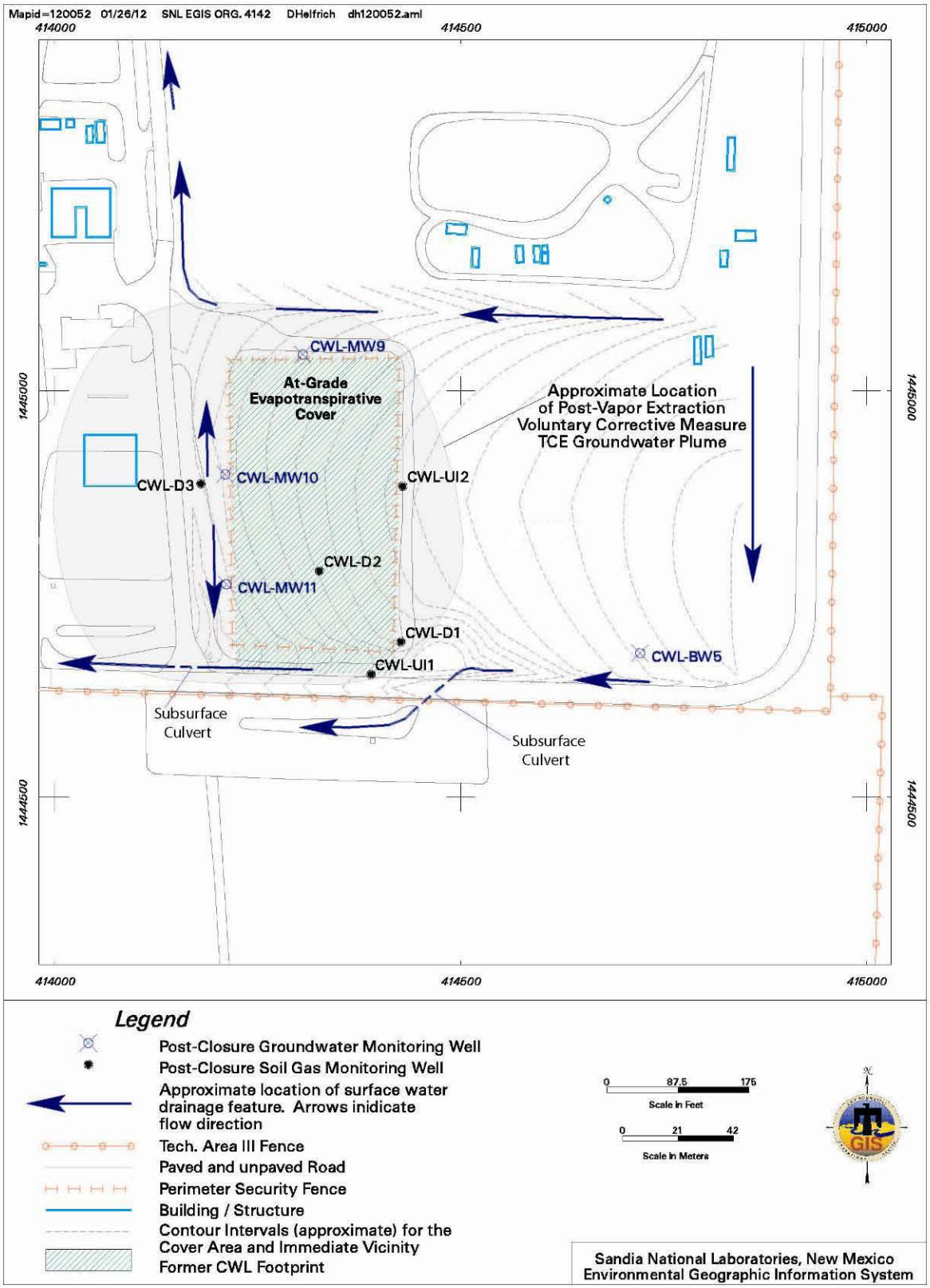

Figure 2-4
Chemical Waste Landfill Surface Drainage Patterns and Monitoring Networks

2.3 Storm-Water Diversion Structures

The function of the storm-water diversion features associated with the CWL is to minimize soil erosion caused by storm-water run-on and run-off and to reduce the amount of water that could potentially percolate into the former disposal area. Drainage features designed to control surface-water run-on and run-off are shown in Figure 2-4 and include: ET Cover surface topography/slopes that direct water away from and off the ET Cover surface; road ditches; boundary swales; and two ditch drainage culverts at the southeastern and southwestern corners of the CWL that divert surface-water from the road ditch away from the CWL. The slight northeast and southeast inflection of the surface topography to the east of the ET Cover prevents significant run-on by directing the upgradient surface water toward the northern and southern boundary swales. Precipitation that falls directly on the ET Cover is diverted toward the boundary swales that intersect at the northwestern and southwestern corners of the site; its impact is minimized by the native vegetation, the central crown, and gently sloping topography (approximately 3-percent grade from east to west) of the ET Cover surface.

2.4 Security Fence

The perimeter security fence location is shown in Figure 2-4. It is a four-strand, barbed-wire fence with two gates. The gates remain locked except during inspections, maintenance, and monitoring activities. Only authorized personnel control the keys to the locks. Warning signs are posted on all sides of the CWL fence at 100-foot intervals and at the gates.

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3.0 MONITORING AND INSPECTION REQUIREMENTS

Monitoring, inspection, maintenance, and repair requirements are defined in the CWL PCCP Attachment 1 (NMED October 2009 and subsequent revisions) and briefly summarized in this chapter. Monitoring requirements include groundwater and soil-gas, which generate empirical data that are evaluated to assess site conditions over the compliance and post-closure care periods. Inspection requirements apply to the final cover, storm-water diversion structures, compliance monitoring system, and security fence. Emergency equipment required by the CWL Contingency Plan (CWL PCCP Attachment 6) is also subject to routine inspections. Maintenance and/or repairs are performed based upon the inspections. Inspection, maintenance, and repair are performed to ensure the adequate performance of the ET Cover, monitoring networks, and surface features throughout the post-closure care period.

Monitoring and inspection activities were conducted in January and July in accordance with CWL PCCP Attachment 5. Results of CY 2012 monitoring and inspection activities are presented in Chapters 4.0, 5.0, and 6.0. The following sections provide information specific to the requirements for each type of monitoring under the PCCP.

3.1 Monitoring Requirements

The frequency, parameters/constituents of concern, and methods for groundwater and soil-gas monitoring are summarized in Table 3-1. The groundwater and soil-gas monitoring networks are described in Section 2.2.1 and 2.2.2 respectively. The groundwater and soil-gas monitoring requirements are detailed in CWL PCCP Attachment 1, Section 1.8. Sampling and analysis plans (SAPs) in CWL PCCP Attachments 2 and 3, respectively, describe the procedures, methods, and analytical protocols for collecting and analyzing groundwater and soil-gas samples.

Table 3-1
Chemical Waste Landfill Groundwater and
Soil-Gas Monitoring Frequency, Parameters, and Methods

Monitoring System	Monitoring Frequency	Monitoring Parameters/ Constituents of Concern	Monitoring Method
Groundwater	Semi-Annually[a]	TCE by EPA Method 8260[b] and Cr and Ni by EPA Methods 6020[a]	Sampling and Analysis per CWL PCCP Attachment 2
Soil Gas	Annually	Compendium Method TO-14 VOCs[c] or equivalent[d]	Sampling and Analysis per CWL PCCP Attachment 3

Notes:
[a]Semi-Annually: An enhanced list of constituents must be analyzed on an annual basis (see Section 1.8.1.1 of PCCP Attachment 1).
[b]EPA November 1986.
[c]EPA January 1999. See Table 1-5 in PCCP Attachment 1 for the list of the TO-14 VOCs.
[d]Use of an analytical method equivalent to TO-14, such as EPA Method TO-15, was approved by NMED in February 2012 as part of a PCCP modification (Kieling February 2012).
EPA = U.S. Environmental Protection Agency.
TO-14 = EPA Method TO-14.

For groundwater monitoring, one semi-annual sampling event must include analysis of all environmental samples for TCE, chromium, and nickel. For the other semi-annual event, analysis of all environmental samples for an enhanced list of constituents comprised of 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113), tetrachlorethene (PCE), 1,1-dichloroethene (1,1-DCE), chloroform, and trichlorofluoromethane (Freon 11), in addition to TCE, chromium, and nickel, is required. Groundwater surface elevation must be measured each time groundwater is sampled and the groundwater flow rate, hydraulic gradient, and flow direction must be determined at least annually.

Soil-gas monitoring must be performed annually in accordance with the Soil-Gas SAP (CWL PCCP Attachment 3) using U.S. Environmental Protection Agency (EPA) Compendium Method TO-14 (EPA January 1999) or equivalent (i.e., such as the newer method TO-15) to ensure the collection of data in a manner consistent with historic soil-gas monitoring. Consistency in sampling and analysis is necessary so that results can be evaluated over time to determine changes/trends in soil-gas concentrations.

3.2 Inspection, Maintenance, and Repair Requirements

Inspection requirements for the final cover system, storm-water diversion structures, compliance monitoring system, security fence, and emergency equipment are briefly summarized in this section and detailed in CWL PCCP Attachment 1, Section 1.9. All inspections were performed by personnel who meet the qualification and training requirements of CWL PCCP Attachment 5. The schedule for implementing inspections and prescribed maintenance and/or repairs is provided in CWL PCCP Attachment 1, Section 1.10, Table 1-6. Maintenance and/or repairs are performed as needed based upon the inspections.

3.2.1 Final Cover System Inspection/Maintenance/Repair Requirements

Inspection of the final cover includes vegetation inspection and monitoring by the staff biologist (i.e., biology inspection) and cover inspection by a field technician.

3.2.1.1 Vegetation Inspection and Monitoring

Achieving a sustainable native plant community on the final cover is an important component of overall ET Cover performance. Vegetation minimizes erosion by stabilizing the ET Cover surface and by moving soil moisture from the ET Cover to the atmosphere through transpiration.

Cover vegetation monitoring is to be accomplished in a two-phase approach. The first phase concentrates on establishing the vegetation on the ET Cover from seed to a mature plant community such that successful revegetation criteria (defined in CWL PCCP Attachment 1 Section 1.9) are met. These criteria are provided below.

- Total percent foliar coverage equals 20 percent (i.e., 20 percent of the land surface is covered with living plants versus 80 percent bare surface area;
- Of the 20 percent total foliar coverage, 50 percent or greater comprises native perennial species, and 50 percent or less comprises annual species; and

- No contiguous bare spots greater than 200 square feet (approximately 14 by 14 feet) are present.

During this first phase of vegetation inspection and monitoring a staff biologist must inspect and document the inventory of the main flora populating the cover on a quarterly basis. These inspections are to be documented on the Biology Inspection Form/Checklist (CWL PCCP Attachment 4) and include inspecting the cover for contiguous areas lacking vegetation in excess of 200 square feet, signs of animal intrusion, and deep-rooted plants. Any repairs required by the inspection to address vegetation parameters not meeting CWL PCCP specifications are to be performed as described in Section 3.2.1.3. At the end of each CY, the staff biologist must compile the results of the quarterly inspections, summarize local climate trends, and present recommendations in a summary report that will be included in the annual CWL post-closure care report submitted to NMED.

Once successful revegetation criteria are met, the second phase of cover vegetation inspection and monitoring begins. During this phase the staff biologist inspection frequency changes to annual. The biology inspection is to occur near the end of the growing season (August-September) to most accurately determine the coverage of living plants. As with the first phase, the inspection is to be documented on the Biology Inspection Form/Checklist (CWL PCCP Attachment 4), include inspection results for the same parameters as the first phase of inspection, and be documented in a summary report along with a summary of local climate trends and recommendations.

3.2.1.2 Cover Inspection Requirements

Cover inspections are required to be performed by a field technician on a quarterly basis to assess the physical integrity of the ET Cover. Settlement of the cover surface in excess of 6 inches, erosion of the cover soil in excess of 6 inches deep, areas of ponding water, animal intrusion burrows in excess of 4 inches in diameter, contiguous areas lacking vegetation in excess of 200 square feet, and any other conditions that may impact the cover integrity must be documented on the Post-Closure Inspection Form/Inspection Checklist (CWL PCCP Attachment 4). During the first phase of quarterly cover vegetation monitoring described in Section 3.2.1.1, documentation of animal intrusion burrows in excess of 4 inches in diameter and contiguous areas lacking vegetation in excess of 200 square feet are addressed on the Biology Inspection Form/Checklist. During the second phase of annual cover vegetation monitoring, these inspection parameters must be noted by the field technician on the Post-Closure Inspection Form/Checklist.

3.2.1.3 Cover Repairs

Cover damage exceeding CWL PCCP specifications is required to be repaired within 60 days to a condition that meets or exceeds the original design. However, repairs to fix inadequate cover vegetation may be delayed until the appropriate growing season if approved by NMED in advance, and if measures are taken as needed to prevent excessive erosion of the ET Cover during the delay period. Repairs to the cover are to be completed using materials consistent with the cover installation specifications in accordance with PCCP Attachment 1, Section 1.9.1.3.

3.2.2 Storm-Water Diversion Structure Inspection Requirements

Inspection of the storm-water diversion structures is required on a quarterly basis to verify structural integrity and to ensure adequate performance. This inspection is to be performed at the same time as the cover inspection. Erosion of the channels or sidewalls in excess of 6 inches deep, accumulations of silt greater than 6 inches deep, or debris that block more than one-third of the channel width must be documented on the Post-Closure Inspection Form/Inspection Checklist. Repairs, if needed, will be completed within 60 days.

3.2.3 Monitoring Well Network Inspection Requirements

Inspection of monitoring wells and sampling equipment is required at the same frequency as the associated monitoring, and is to be performed concurrently with all groundwater and soil-gas monitoring events. Inspections must address the condition of the components including protective casings and bollards, wellhead covers/caps/locks, soil-gas sampling ports, well identification markings, and passive venting BaroBalls™ or equivalent devices. Sampling pumps and sample tubing are inspected during each sampling event (pumps are not dedicated to the wells). Pump replacement and maintenance/repair, and tubing replacement are performed on an as-needed basis based upon pump and tubing performance, inspections, and review of analytical sampling results. Excessive accumulation of wind-blown plants and debris that would interfere with any of the groundwater or soil-gas monitoring network components will also be addressed and removed during these inspections within 60 days.

3.2.4 Security Fence Inspection Requirements

Inspection of the fence, gates, locks, and warning signs at the CWL is required on a quarterly basis and is to be performed at the same time as the cover inspection. The condition of the fence, including fence wires, posts, gates, gate locks, and warning signs, is to be inspected and documented on the Post-Closure Inspection Form/Inspection Checklist. Excessive accumulations of wind-blown plants and debris on the fence that would obscure warning signs or block access to the CWL will be addressed during the inspection and removed within 60 days. Local survey monuments must also to be inspected and excess soil and/or vegetation covering these features will be removed within 60 days.

3.2.5 Emergency Equipment Inspection Requirements

Inspection of emergency equipment is required to be performed on a quarterly basis. Emergency equipment is maintained at the nearby Corrective Action Management Unit (CAMU) for use at the CWL, if necessary. A list of emergency equipment and its location is provided in CWL PCCP Attachment 6, Table 6-4.

4.0 GROUNDWATER MONITORING RESULTS

This chapter presents groundwater monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation for CY 2012 in accordance with CWL PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 2. Groundwater sampling field activities are described in Section 4.1, analytical laboratory results and a discussion of data quality are presented in Section 4.2, data evaluation requirements and results are presented in Section 4.3, and hydrogeologic information on the regional aquifer is presented in Section 4.4. A summary of groundwater monitoring activities and results is provided in Section 8.1.

4.1 Groundwater Sampling Field Activities

This section describes groundwater monitoring activities conducted at the CWL in conformance with the CWL Groundwater SAP, PCCP Attachment 2 (NMED October 2009 and subsequent revisions) that describes the procedures, methods, and analytical protocols for collecting and analyzing groundwater samples. The data quality objective (DQO) for groundwater monitoring is to collect accurate and defensible data of high quality to determine the concentrations of hazardous constituents in the groundwater in the uppermost aquifer underlying the CWL. Field forms and documentation that address calibration of equipment, well purging and water quality measurements, and equipment decontamination activities are provided in Annex A of this report and filed in the SNL/NM Records Center.

CY 2012 was the first full year of monitoring under the CWL PCCP and included two semi-annual groundwater sampling events described in detail in the following paragraphs.

First Semi-Annual Sampling Event – January 17-23, 2012
Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11. Samples collected from all wells were analyzed for the enhanced list of volatile organic compounds (VOCs), chromium, and nickel. The enhanced list of VOCs includes 1,1-dichloroethene (1,1-DCE), 1,1,2-trichloro-1 2,2-trifluoroethane (Freon 113), chloroform, tetrachloroethene (PCE), TCE, and trichlorofluoromethane (Freon 11). A duplicate sample was collected from CWL-BW5 and analyzed for all parameters.

Representatives of the NMED U.S. Department of Energy Oversight Bureau (NMED OB) were present during sampling and received split samples for all analyses at each monitoring well except CWL-BW5. The NMED OB split analytical results are not included in this report.

Second Semi-Annual Sampling Event – July 5-11, 2012
Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11. Samples collected from all wells were analyzed for TCE, chromium, and nickel. Duplicate samples were collected from CWL-MW10 and CWL-MW11 and analyzed for all parameters.

4.1.1 Well Purging

Purging removes stagnant water from the well so that a representative groundwater sample can be obtained. For the January 2012 monitoring event the minimum purge requirement for a

portable piston pump was one borehole volume (the volume of all static water in the well plus the volume of water in the adjacent filter packs). Purging continued until four stable field measurements for temperature, specific conductance (SC), potential of hydrogen (pH), and turbidity were obtained in monitoring wells that did not purge dry. As specified in PCCP Attachment 2, Section 2.12, groundwater stability is considered acceptable when measurements are less than five nephelometric turbidity units (NTU) for turbidity, pH is within 0.1 units, temperature is within 1.0 degree Celsius, and SC is within five percent as micromhos per centimeter. Field measurements for water quality parameters were collected using a YSI™ Model 620 Water Quality Meter, and a HACH™ Model 2100P portable turbidity meter. Additional water quality measurements included oxidation-reduction potential (ORP) and dissolved oxygen (DO).

In accordance with requested modifications to the PCCP (Wagner November 2011) that were approved in February 2012 (Kieling February 2012), purging volume and stability requirements were revised for the July 2012 monitoring event. The minimum purge requirement was changed to one saturated casing volume (the volume of all static water in the well screen plus the borehole annulus around the saturated screen interval). However, for the July groundwater sampling event the more conservative (i.e., larger) purging volume based on the original purging requirement was used (i.e., one borehole volume or the volume of all static water in the well screen interval and sump, plus the volume of water in the adjacent borehole annulus filter packs). The new purge volume requirement will be implemented during the next CWL groundwater monitoring event in 2013. Groundwater stability requirements were changed to clarify the stability criterion if final turbidity measurements are greater than 5 NTU; however, this scenario did not occur at any of the CWL groundwater monitoring wells during either sampling event.

The following information applies to both sampling events. A portable Bennett Company groundwater sampling system was used to collect groundwater samples from all wells. Minimum purge requirements were satisfied at all monitoring wells, except at CWL-MW10. This monitoring well was purged to dryness, allowed to recover, and then sampled to collect the most representative groundwater sample possible given the low yield of this well. In an effort to decrease flow rate for wells that purge dry, the existing sampling system is equipped with a flow meter valve located along the discharge line, and with small diameter tubing. During the purging process at wells prone to purging dry, the flow rate is continually adjusted to achieve as low a flow rate as possible without causing the pump to fail. This represents a “best faith effort” to purge the wells at the slowest rate possible given equipment limitations as specified in PCCP Attachment 2, Section 2.12.

Details of purging activities for the two sampling events are described in the following paragraphs for CWL-MW10, which is the only well that purged dry.

First Semi-Annual Sampling Event – January 17-23, 2012-
Monitoring well CWL-MW10 was purged for 167 minutes and slightly more than 21-gallons were purged prior to the well going dry (minimum purge volume goal was 38 gallons). The flow rate was continually adjusted throughout this purge event, within equipment limitations. The average flow rate during this purge is estimated at 0.127 gallons per minute (gpm), equivalent to 0.48 liters per minute.

Second Semi-Annual Sampling Event – July 5-11, 2012
Monitoring well CWL-MW10 was purged approximately 20-gallons prior to the well going dry (minimum purge volume goal was 38 gallons). The flow rate was continually adjusted

throughout this purge event, within equipment limitations. The average flow rate during this purge is estimated at 0.13 gpm, and the estimated flow rate was 0.06 gpm during the final four gallons (equivalent of 0.49 and 0.23 liters per minute, respectively).

4.1.2 Field Quality Control

Field quality control (QC) samples were collected as part of each sampling event and included environmental duplicate, equipment blank, trip blank, and field blank samples. The sampling pump and tubing bundle used to collect groundwater samples were decontaminated prior to sampling each monitoring well according to procedures described in "Groundwater Monitoring Equipment Decontamination," SNL/NM field operating procedure (FOP) FOP 05-03. The field QC samples were submitted for analysis along with the groundwater samples. A brief explanation of the field QC samples for the January and July sampling events is provided below; additional information on each type of QC sample is described in PCCP Attachment 2, Section 2.20.1. Analytical results are presented in Section 4.2.2.

First Semi-Annual Sampling Event – January 17-23, 2012
A duplicate environmental sample was collected from CWL-BW5. The duplicate sample was collected immediately after the original environmental sample to reduce variability caused by time and/or sampling mechanics.

One equipment blank sample (also referred to as a rinsate blank) was collected prior to sampling CWL-BW5 and submitted for all analyses.

A total of five trip blank samples were submitted along with the January 2012 groundwater samples and analyzed for the enhanced list of VOCs (TCE plus tetrachlorethene, 1,1-dichloroethene, trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, and chloroform).

A field blank sample was collected for VOC analysis (enhanced list) by pouring deionized water into sample containers at the CWL-MW10 sample point to simulate the transfer of environmental samples from the sampling system to the sample container.

Second Semi-Annual Sampling Event – July 5-11, 2012
Two duplicate environmental samples were collected; one each from CWL-MW10 and CWL-MW11. The duplicate samples were collected immediately after the original environmental sample to reduce variability caused by time and/or sampling mechanics.

Two equipment blank samples were collected; one each prior to sampling CWL-MW10 and CWL-MW11. The samples were submitted for all analyses.

A total of five trip blank samples were submitted along with the July 2012 groundwater samples and analyzed for TCE.

Two field blank samples were collected for TCE analysis by pouring deionized water into sample containers at the CWL-BW5 and CWL-MW9 sample points to simulate the transfer of environmental samples from the sampling system to the sample container.

4.1.3 Waste Management

Purge and decontamination water generated from sampling activities were placed into 55-gallon containers and stored at the Environmental Resources Field Office less than 90-day waste accumulation area. Approximately 259 gallons of purge water were generated during the January 2012 groundwater sampling event and approximately 281 gallons of purge water were generated during the July 2012 event. Separate waste characterization samples were collected from purge and decontamination water and analyzed for discharge parameters. All purge water was discharged to the sanitary sewer after waste characterization data were compared to Albuquerque Bernalillo County Water Utility Authority discharge limits and an SNL/NM sanitary sewer discharge approval was obtained.

Personal protective equipment and other solid waste generated during January and July 2012 monitoring activities were packaged into 5-gallon plastic buckets and managed as hazardous waste. This waste was submitted to the Hazardous Waste Management Facility for ultimate disposal at a permitted off-site facility.

4.2 Laboratory Results

Groundwater samples and field QC samples were submitted to GEL Laboratories for analyses. Samples were analyzed in accordance with applicable EPA analytical methods. For comparison, hazardous constituent concentration limits from the CWL PCCP are included in the analytical results tables. Analytical results that are above the analytical laboratory method detection limit (MDL) but below the practical quantitation limit (PQL) are qualified as estimated values and designated with a "J" qualifier. Analytical laboratory reports, including certificates of analyses, analytical methods, MDLs, PQLs, dates of analyses, results of QC analyses, and data validation results are filed in the SNL/NM Records Center.

4.2.1 Environmental Sample Results

Table 4-1 summarizes TCE results and Table 4-2 summarizes chromium and nickel results for the January and July 2012 groundwater sampling events. Table 4-3 summarizes results for the additional VOCs (enhanced list) included in the January 2012 event (tetrachlorethene, 1,1-dichloroethene, trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, and chloroform). Table 4-4 summarizes field water quality measurements collected prior to sampling for both events. Field water quality measurements include turbidity, pH, temperature, SC, ORP, and DO. A summary of the results from the January and July sampling events is provided below.

First Semi-Annual Sampling Event – January 17-23, 2012
TCE was only detected above the laboratory MDL at CWL-MW10 at a concentration of 4.68 µg/L, which is below the concentration limit of 5.0 µg/L. None of the enhanced list VOCs (tetrachlorethene, 1,1-dichloroethene, trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, and chloroform) were detected in the samples.

Chromium was not detected above the laboratory MDL in any sample. Nickel was detected in all samples at concentrations ranging from 0.00177 milligrams per liter (mg/L) in CWL-BW5 to

Table 4-1
Summary of Trichloroethene Results
Chemical Waste Landfill Groundwater Monitoring
Analytical Method SW846-8260B[a]
Calendar Year 2012

Well ID	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Concentration Limit[b] (µg/L)	Laboratory Qualifier[c]	Validation Qualifier[c]	Sample No.
January 2012 Sampling Event							
CWL-BW5 18-Jan-12	ND	0.250	1.00	5.00	U	--	091638-001
CWL-BW5 (Duplicate) 18-Jan-12	ND	0.250	1.00	5.00	U	--	091639-001
CWL-MW9 17-Jan-12	ND	0.250	1.00	5.00	U	--	091632-001
CWL-MW10 23-Jan-12	4.68	0.250	1.00	5.00	--	--	091647-001
CWL-MW11 19-Jan-12	ND	0.250	1.00	5.00	U	--	091643-001
July 2012 Sampling Event							
CWL-BW5 05-July-12	ND	0.300	1.00	5.00	U	--	092579-001
CWL-MW9 06-July-12	ND	0.300	1.00	5.00	U	--	092584-001
CWL-MW10 11-July-12	3.62	0.300	1.00	5.00	--	--	092598-001
CWL-MW10 (Duplicate) 11-July-12	3.62	0.300	1.00	5.00	--	--	092599-001
CWL-MW11 09-July-12	ND	0.300	1.00	5.00	U	--	092591-001
CWL-MW11 (Duplicate) 09-July-12	ND	0.300	1.00	5.00	U	--	092592-001

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
[b]Concentration limit from CWL PCCP, Attachment 1, Table 1-2 (NMED October 2009).
[c]Laboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples. See explanation for "U" laboratory qualifier below.
EPA = U.S. Environmental Protection Agency.
MCL = Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations (40 CFR 141.11(b)), National Primary Drinking Water Standards, EPA, July 2002.
MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix-specific.
µg/L = Micrograms per liter.
ND = Not detected (at method detection limit).
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
U = Analyte not present or concentration is below the method detection limit.

Table 4-2
Summary of Chromium and Nickel Results
Chemical Waste Landfill Groundwater Monitoring
Analytical Method SW846-6020[a]
Calendar Year 2012

Well ID/ Sample Date	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	Conc. Limit[b] (mg/L)	Laboratory Qualifier[c]	Validation Qualifier[c]	Sample No.
January 2012 Sampling Event								
CWL-BW5 18-Jan-12	Chromium	ND	0.002	0.010	0.050	U	--	091638-015
	Nickel	0.00177	0.0005	0.002	0.028	J	J+	091638-015
CWL-BW5 (Duplicate) 18-Jan-12	Chromium	ND	0.002	0.010	0.050	U	--	091638-015
	Nickel	0.00218	0.0005	0.002	0.028	--	J+	091638-015
CWL-MW9 17-Jan-12	Chromium	ND	0.002	0.010	0.050	U	--	091632-015
	Nickel	0.00306	0.0005	0.002	0.028	--	J+	091632-015
CWL-MW10 23-Jan-12	Chromium	ND	0.002	0.010	0.050	U	--	091647-015
	Nickel	0.00246	0.0005	0.002	0.028	--	--	091647-015
CWL-MW11 19-Jan-12	Chromium	ND	0.002	0.010	0.050	U	--	091643-015
	Nickel	0.00205	0.0005	0.002	0.028	--	J+	091643-015
July 2012 Sampling Event								
CWL-BW5 05-July-12	Chromium	ND	0.002	0.010	0.050	U	--	092579-015
	Nickel	0.0041	0.0005	0.002	0.028	--	--	092579-015
CWL-MW9 06-July-12	Chromium	ND	0.002	0.010	0.050	U	--	092584-015
	Nickel	0.00435	0.0005	0.002	0.028	--	--	092584-015
CWL-MW10 11-July-12	Chromium	ND	0.002	0.010	0.050	U	--	092598-015
	Nickel	0.00307	0.0005	0.002	0.028	B	--	092598-015
CWL-MW10 (Duplicate) 11-July-12	Chromium	ND	0.002	0.010	0.050	U	--	092599-015
	Nickel	0.00292	0.0005	0.002	0.028	B	--	092599-015
CWL-MW11 09-July-12	Chromium	0.00246	0.002	0.010	0.050	J	--	092591-015
	Nickel	0.00255	0.0005	0.002	0.028	B	0.00264U	092591-015
CWL-MW11 (Duplicate) 09-July-12	Chromium	0.00258	0.002	0.010	0.050	J	--	092592-015
	Nickel	0.00273	0.0005	0.002	0.028	B	--	092592-015

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd ed.
[b]Concentration limit from CWL PCCP, Attachment 1, Table 1-2 (NMED October 2009).
[c]Laboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted sample. See explanation for "B," "J," and "U" laboratory qualifiers below:
B = Analyte is detected in associated laboratory method blank.
J = Amount detected is below the practical quantitation limit (PQL).

J+ = The associated numerical value is an estimated quantity with a suspected positive bias.
U = Analyte is absent or below the method detection limit.
EPA = U.S. Environmental Protection Agency.
MCL = Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations (40 CFR 141.11(b)), National Primary Drinking Water Standards, EPA, July 2002.
MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix-specific.
mg/L = Milligrams per liter.
ND = Not detected (at method detection limit).
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.

Table 4-3
Summary of Additional Volatile Organic Compound Results
Chemical Waste Landfill Groundwater Monitoring
Analytical Method SW846-8260B[a]
January 2012

Well ID	Analyte	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	MCL (µg/L)	Laboratory Qualifier[b]	Validation Qualifier[b]	Sample No.
CWL-BW5	1,1-Dichloroethene	ND	0.300	1.00	7.00	U	--	091638-001
18-Jan-12	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00	5.00	NE	U	--	091638-001
	Chloroform	ND	0.250	1.00	NE	U	--	091638-001
	Tetrachloroethene	ND	0.300	1.00	5.00	U	--	091638-001
	Trichlorofluoromethane	ND	0.300	1.00	NE	U	--	091638-001
CWL-BW5	1,1-Dichloroethene	ND	0.300	1.00	7.00	U	--	091639-001
(Duplicate) 18-Jan-12	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00	5.00	NE	U	--	091639-001
	Chloroform	ND	0.250	1.00	NE	U	--	091639-001
	Tetrachloroethene	ND	0.300	1.00	5.00	U	--	091639-001
	Trichlorofluoromethane	ND	0.300	1.00	NE	U	--	091639-001
CWL-MW9	1,1-Dichloroethene	ND	0.300	1.00	7.00	U	--	091632-001
17-Jan-12	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00	5.00	NE	U	--	091632-001
	Chloroform	ND	0.250	1.00	NE	U	--	091632-001
	Tetrachloroethene	ND	0.300	1.00	5.00	U	--	091632-001
	Trichlorofluoromethane	ND	0.300	1.00	NE	U	--	091632-001
CWL-MW10	1,1-Dichloroethene	ND	0.300	1.00	7.00	U	--	091647-001
23-Jan-12	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00	5.00	NE	U	--	091647-001
	Chloroform	ND	0.250	1.00	NE	U	--	091647-001
	Tetrachloroethene	ND	0.300	1.00	5.00	U	--	091647-001
	Trichlorofluoromethane	ND	0.300	1.00	NE	U	--	091647-001
CWL-MW11	1,1-Dichloroethene	ND	0.300	1.00	7.00	U	--	091643-001
19-Jan-12	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.00	5.00	NE	U	--	091643-001
	Chloroform	ND	0.250	1.00	NE	U	--	091643-001
	Tetrachloroethene	ND	0.300	1.00	5.00	U	--	091643-001
	Trichlorofluoromethane	ND	0.300	1.00	NE	U	--	091643-001

Notes:
[a]U.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.
[b]Laboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples. See explanation for "U" laboratory qualifier below:
EPA = U.S. Environmental Protection Agency.
MCL = Maximum contaminant level. Established by the U.S. Environmental Protection Agency Primary Water Regulations (40 CFR 141.11(b)), National Primary Drinking Water Standards, EPA, July 2002.
MDL = Method detection limit. The minimum concentration or activity that can be measured and reported with 99% confidence that the analyte is greater than zero, analyte is matrix-specific.
µg/L = Micrograms per liter.
ND = Not detected (at method detection limit).
NE = Not established.
PQL = Practical quantitation limit. The lowest concentration of analytes in a sample that can be reliably determined within specified limits of precision and accuracy by that indicated method under routine laboratory operating conditions.
U = Analyte not present or concentration is below the method detection limit.

Table 4-4
Summary of Field Water Quality Measurements[a]
Chemical Waste Landfill Groundwater Monitoring
Calendar Year 2012

Well ID/ Sample Date	Temperature (°C)	SC (µmho/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (% Sat)	DO (mg/L)
January 2012 Sampling Event							
CWL-BW5 18-Jan-12	17.95	1217	411.9	6.65	0.87	70.4	6.56
CWL-MW9 17-Jan-12	18.47	1075	308.6	6.73	0.56	18.0	1.68
CWL-MW10 23-Jan-12	14.72	967	383.9	7.14	3.21	46.0	4.66
CWL-MW11 19-Jan-12	19.61	1100	374.2	6.76	0.46	50.0	4.49
July 2012 Sampling Event							
CWL-BW5 05-July-12	20.86	999	189.3	6.71	0.37	80.4	7.15
CWL-MW9 06-July-12	20.94	889	-1.2	6.77	0.42	21.5	1.90
CWL-MW10 11-July-12	22.76	807	141.0	7.03	2.04	50.6	4.33
CWL-MW11 09-July-12	25.80	931	156.2	6.84	0.65	67.5	5.18

Notes:
[a]Field measurements collected prior to sampling.
°C = Degrees Celsius.
% Sat = Present saturation.
DO = Dissolved oxygen.
mg/L = Milligrams per liter.
µmho/cm = Micromhos per centimeter.
mV = Millivolts.
ORP = Oxidation-reduction potential.
NTU = Nephelometric turbidity units.
pH = Potential of hydrogen (negative logarithm of the hydrogen ion concentration).
SC = Specific Conductance.

0.00306 mg/L in the CWL-MW9 environmental sample. Chromium and nickel were not detected above the established concentration limits.

Second Semi-Annual Sampling Event – July 5-11, 2012
TCE was only detected above the laboratory MDL at CWL-MW10 at a concentration of 3.62 µg/L, which is below the concentration limit of 5.0 µg/L.

Chromium was not detected above the laboratory MDL in any sample. Nickel was detected in all samples at concentrations ranging from 0.00273 mg/L in CWL-MW11 duplicate sample to 0.00435 mg/L in the CWL-MW9 environmental sample. The nickel result in the CWL-MW11 environmental sample was qualified as not detected during data validation, since the result is less than five times the concentration detected in the laboratory method blank sample. Chromium and nickel were not detected above the established concentration limits.

4.2.2 Field Quality Control Sample Results

Tables 4-1 through 4-4 present field duplicate results for samples collected in the January and July sampling events. Table 4-5 summarizes results of duplicate sample analyses and the calculated relative percent difference (RPD) values between the environmental and duplicate sample results. RPD values are only calculated for detected constituents and show good agreement (i.e., RPD values < 20 for organics and < 35 for metals).

Table 4-5
Summary of Detected Duplicate Samples
Chemical Waste Landfill Groundwater Monitoring
Calendar Year 2012

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD[a]
January 2012 Sampling Event			
CWL-BW5			
Nickel (mg/L)	0.00177	0.00218	21
July 2012 Sampling Event			
CWL-MW10			
Trichloroethene (µg/L)	3.62	3.62	< 1
Nickel (mg/L)	0.00307	0.0029	6
CWL-MW11			
Chromium (mg/L)	0.00246	0.00258	5
Nickel (mg/L)	ND	0.00273	NC

Notes:
[a]RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number.

$$RPD = \frac{|R_1 - R_2|}{[(R_1 + R_2)/2]} \times 100$$

where: R_1 = Analysis result.
R_2 = Duplicate analysis result.

µg/L = microgram(s) per liter.
mg/L = milligram(s) per liter.
NC = not calculated
ND = not detected

One equipment blank and one field blank sample were collected in January and analyzed for all constituents, including TCE, enhanced list VOCs (tetrachlorethene, 1,1-dichloroethene, trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, and chloroform), chromium, and nickel. None of these constituents were detected except for chloroform in the equipment blank sample. No corrective action was necessary since this compound was not detected in any of the environmental samples. The two equipment blank and two field blank samples collected in July were analyzed for all constituents, including TCE, chromium, and nickel. None of these

constituents were detected. The five trip blank samples and one field blank sample collected in January were analyzed for TCE and the enhanced list of VOCs; none of these VOCs were detected. The five trip blank samples and one field blank sample collected in July were analyzed for TCE only; TCE was not detected.

4.2.3 Data Quality

Field QC sample results met the sampling DQOs and validated the adequacy of the field sampling procedures and protocol. Internal laboratory QC samples, including method blanks, matrix spikes, and laboratory control samples, were analyzed concurrently with environmental groundwater samples. All chemical data was reviewed and qualified in accordance with SNL/NM Administrative Operating Procedure (AOP) AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM May 2011).

Nickel results in the CWL-BW5, CWL-MW9, and CWL-MW11 January 2012 samples were qualified as estimated values during data validation since nickel was detected in the associated interference check sample. Nickel in the July CWL-MW11 environmental duplicate sample was qualified as not detected during data validation since nickel was reported at a concentration less than five times the detected value in the associated laboratory method blank sample. All data were in compliance with analytical methods and laboratory procedures (i.e., technically defensible). Data Validation Reports and Contract Verification Review forms are provided in Annex A of this report and are filed in the SNL/NM Records Center.

4.2.4 Variances and Non-Conformances

No variances, non-conformances, or project-specific issues were identified during the January and July 2012 semi-annual groundwater sampling events.

After the January groundwater monitoring results were received, DOE and Sandia notified NMED during a conference call on March 5, 2012 (SNL/NM March 2012) regarding installation of passive venting devices (i.e., Baroball™ devices) on all groundwater monitoring wells in accordance with PCCP Attachment 1, Section 1.4.2. Installation was completed on March 9, 2012.

4.3 Data Evaluation

Groundwater monitoring is required to determine whether the groundwater beneath the CWL is in compliance with the groundwater protection standard under 40 CFR § 264.92 and for the determination of statistical significance under 40 CFR § 264.97(h). In accordance with PCCP Attachment 1, Section 1.8.1.2, statistical evaluation of groundwater monitoring results from new wells is not required until after three years of groundwater sampling results have been obtained to allow for the collection of sufficient data (i.e., minimum data set for statistical analysis is six analytical results). For replacement wells, historical groundwater sampling results are used to augment the data sets and increase the amount of data for statistical analysis. Historical groundwater data is limited to data obtained after completion of the VE VCM (July 1998).

Statistical evaluation is limited to results from CWL-BW5/4A for the CY 2012 reporting period. CWL-MW9, CWL-MW10, and CWL-MW11 are new wells installed in 2010 and have been sampled four times (November-December 2010, July-August 2011, January 2012, and July 2012). Statistical evaluation of the results from these wells is not required until the completion of CY 2013 groundwater monitoring.

CWL-BW5 is a replacement well for CWL-BW4A. All results for CWL-BW5 (November-December 2010, July-August 2011, January 2012, and July 2012) and historic results for CWL-BW4A (since completion of the VE VCM) are used for statistical evaluation presented in the following sections. All references to sample results are to CWL-BW5/4A sample results.

4.3.1 Statistical Assessment Requirements

Ground-water monitoring data are statistically evaluated on a well-by-well basis for each of the three hazardous constituents in accordance with the PCCP Attachment 1, Section 1.8.1.2. The hazardous constituents and their respective concentration limits are listed in Table 4-6. Prediction and confidence intervals are calculated and used to evaluate semi-annual groundwater monitoring results. In addition, the cumulative percentage of sample results that are greater than the median (i.e., Median Test) is calculated to determine if there is statistically significant evidence of increased contamination. If a result is below the analytical laboratory detection limits, the MDL for the constituent is used for statistical analysis. More detailed information regarding statistical assessment requirements is provided below and statistical assessment results for CY 2012 groundwater monitoring data are presented in Section 4.3.2.

Table 4-6
Concentration Limits for the Hazardous Constituents of Concern at the Chemical Waste Landfill

Hazardous Constituent	Concentration Limit	Basis of Concentration Limit
Trichloroethene	5 µg/L	EPA MCL, 40 CFR § 264.94(b)
Chromium	0.050 mg/L	Table 1, 40 CFR § 264.94(a)(2)
Nickel	0.028 mg/L	Background level, 40 CFR § 264.94(a)(1)

Notes:
EPA = U.S. Environmental Protection Agency
MCL = Maximum contaminant level.
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.

Prediction and Confidence Intervals

The probability that each semi-annual sample result for a given hazardous constituent falls within the range of previous sample results is determined using prediction intervals. The prediction interval for a given hazardous constituent is the range between the 95% upper confidence limit (UCL) of the mean and the 95% lower confidence limit (LCL) of the mean. Therefore, the probability of a sample result for a given hazardous constituent falling within the range of previous sample results (i.e., between the LCL and the UCL) is 95%. Sample results are also compared to the historical range (minimum and maximum result) to determine whether semi-annual results for the reporting period fall within, below, or above the range of previous sample results.

The 95% LCL is also used to determine statistically significant evidence that the concentration limit for the particular hazardous constituent has been exceeded (NMED October 2009 and subsequent revisions). The calculated 95% LCL is compared to the concentration limit in Table 4-5 and if it exceeds the concentration limit, this is statistically significant evidence that the concentration limit has been exceeded, which triggers corrective action in accordance with PCCP Attachment 1, Section 1.8.3. Individual sample results that exceed the concentration limit do not constitute an exceedance requiring corrective action.

Median Test

The median value is calculated using all historic data prior to the sampling event(s) being evaluated. For example, the median value against which the July 2012 sample results are compared was calculated using all historic results obtained since July 1998 (i.e., completion of the VE VCM) not including the July 2012 sample results. For the next groundwater monitoring event, the median will be recalculated and include the July 2012 sample results. If the cumulative percentage of results that are greater than the median for a given hazardous constituent is 80% or greater, that is considered statistically significant evidence of increased contamination. No action is required due to statistically significant evidence of increasing contamination unless a concentration limit is exceeded (NMED October 2009 and subsequent revisions).

4.3.2 Statistical Assessment Results

CY 2012 groundwater sampling data and statistical analysis for CWL-BW5/4A are discussed in this section. CWL-BW5/4A statistical assessment results are presented in Table 4.-7 and shown graphically in Figures 4-1 through 4-3.

Prediction Intervals

CY 2012 sample results for chromium and TCE were lower than their respective 95% LCLs, and thus are below the prediction interval (range of 95% LCL to 95% UCL). This is due to the decrease in the laboratory detection limit over time and the fact that chromium and TCE are often not detected. Chromium and TCE were not detected in both the January and July 2012 CWL-BW5 groundwater samples. The result for nickel fell within the range of the 95% LCL and 95% UCL. Results for all three hazardous constituents fell within the historical range.

Confidence Intervals

The three hazardous constituent 95% LCLs and 95% UCLs of the mean for the CWL-BW5/4A sample results are presented in Table 4-7 and shown on the associated control charts (Figures 4-1 through 4-3). All 95% LCLs are below the respective concentration limits and therefore there are no exceedances of any concentration limits. There is a single historical nickel result that is greater than the concentration limit (0.49 mg/L) that occurred in a sample from CWL-BW4A collected in August 2001 (Figure 4-2). However, the calculated 95% LCL for nickel is 0.0029 mg/L, significantly below the concentration limit of 0.028 mg/L.

Table 4-7
CWL-BW5/4A Statistical Assessment Results Summary
Calendar Year 2012 Sampling Results

Hazardous Constituent[a]	Minimum[b]	Maximum[b]	Mean[c]	Standard Deviation[c]	LCL[c]	UCL[c]	Distribution Type[c]	Median Test[d]	Concentration Limit Exceeded[e]?
Chromium (mg/L)	0.00038	0.0125	0.0034	0.0033	0.0034	0.005	Lognormal	27%	No
Nickel (mg/L)	0.00109	0.049	0.0057	0.0088	0.0029	0.0084	Normal	50%	No
TCE (µg/L)	0.1	0.6	0.32	0.12	0.28	0.36	Normal	12%	No

Notes:
[a]Hazardous Constituent and Concentration Limit from CWL Permit Attachment 1, Section 1.4.1, Table 1-2 (Table 4-6 of this report).
[b]Minimum and maximum result determined from historical data.
[c]Mean, LCL, UCL, Standard Deviation, and Distribution Type determined using PRO-UCL statistical program.
[d] Median Test is the cumulative percentage of sample results that are greater than the median.
[e]Exceedance determined by comparing the sample result (Tables 4-1, 4-2, and 4-3) against the concentration limit in CWL Permit Attachment 1, Table 1-2 (Table 4-6 of this report).
LCL = Lower confidence limit.
µg/L = Micrograms/liter.
mg/L = Milligrams/liter.
TCE = Trichloroethene.
UCL = Upper confidence limit.

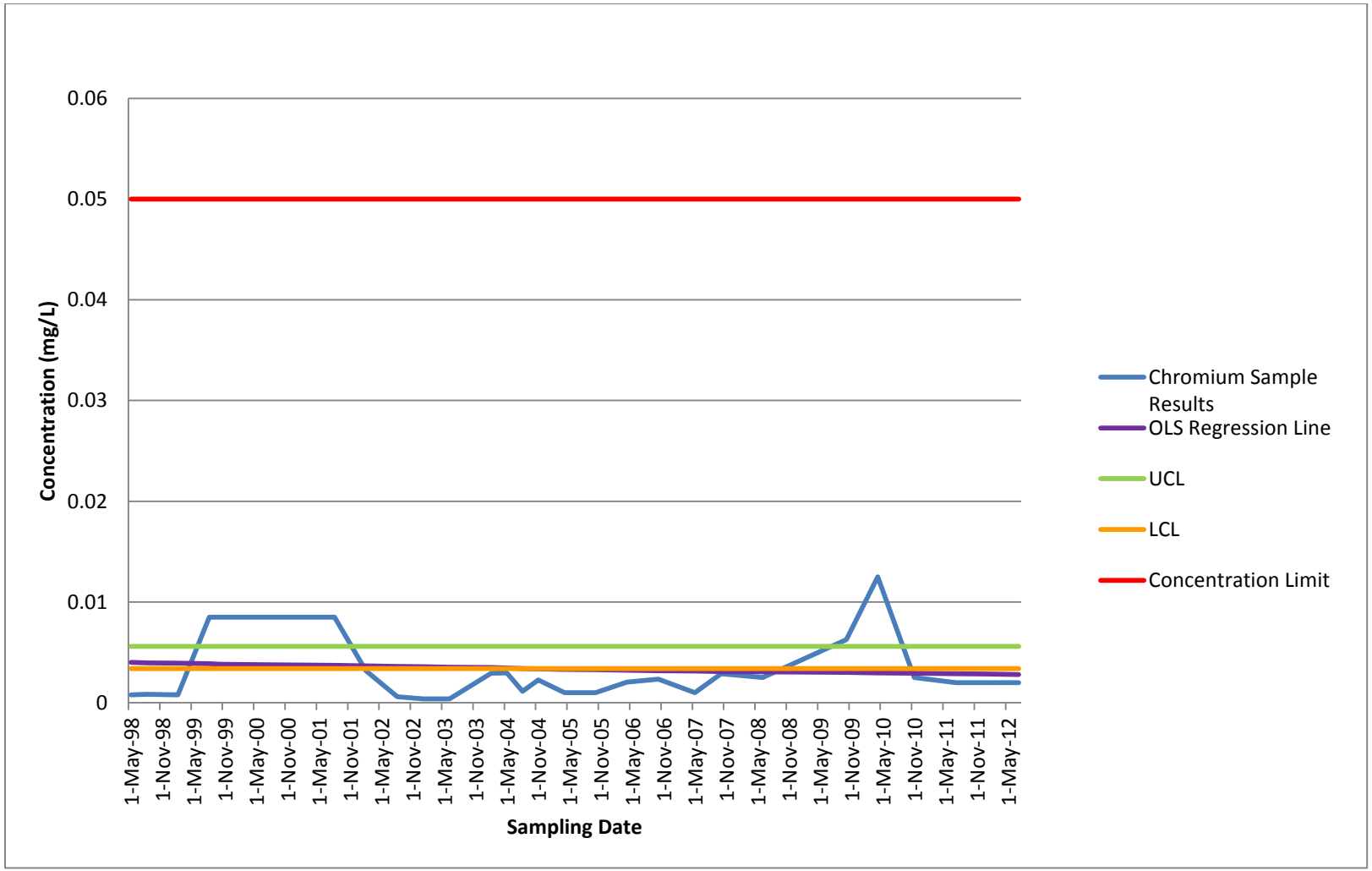

Figure 4-1
Chromium Control Chart for CWL-BW5/4A

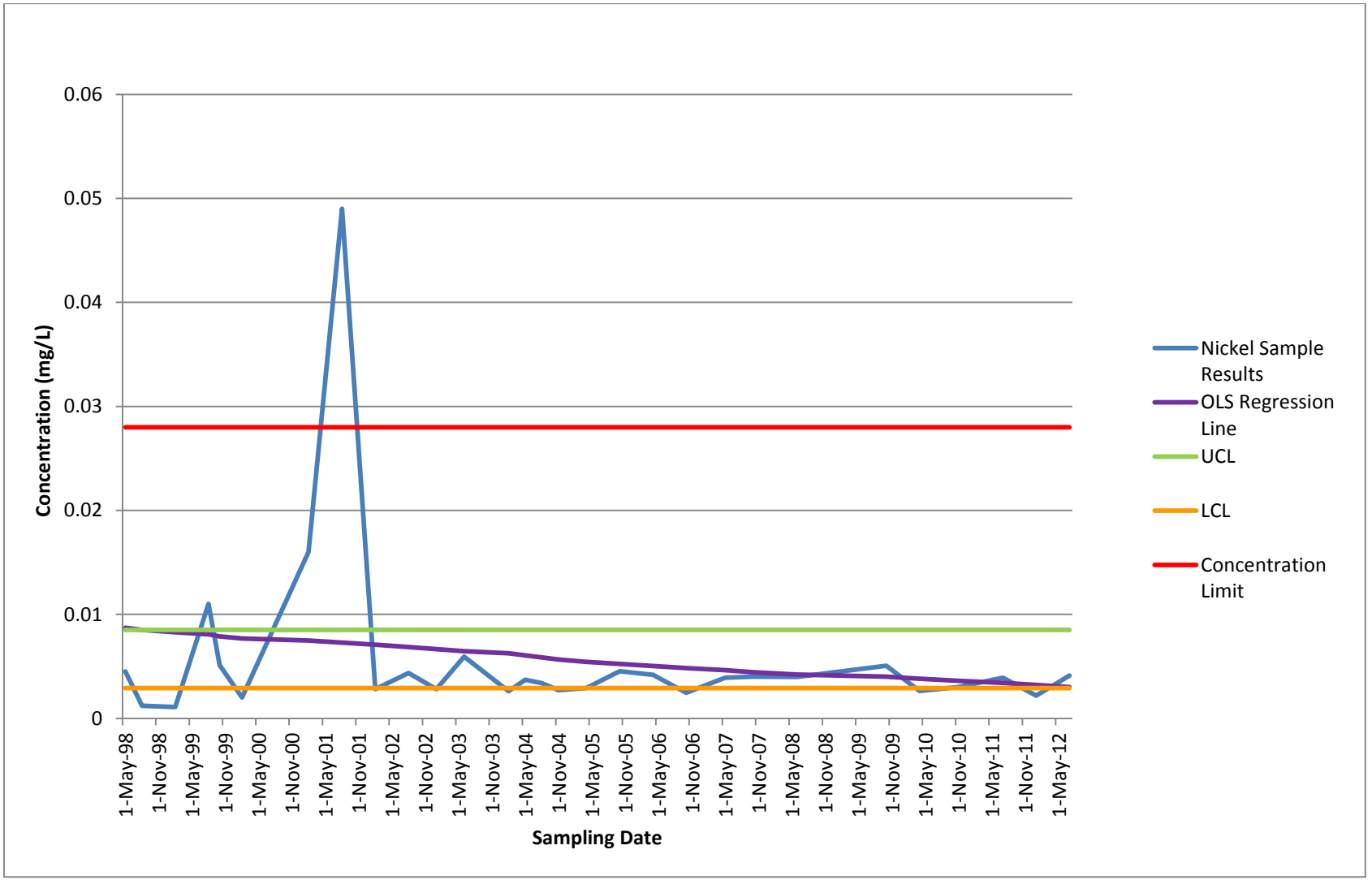

Figure 4-2
Nickel Control Chart for CWL-BW5/4A

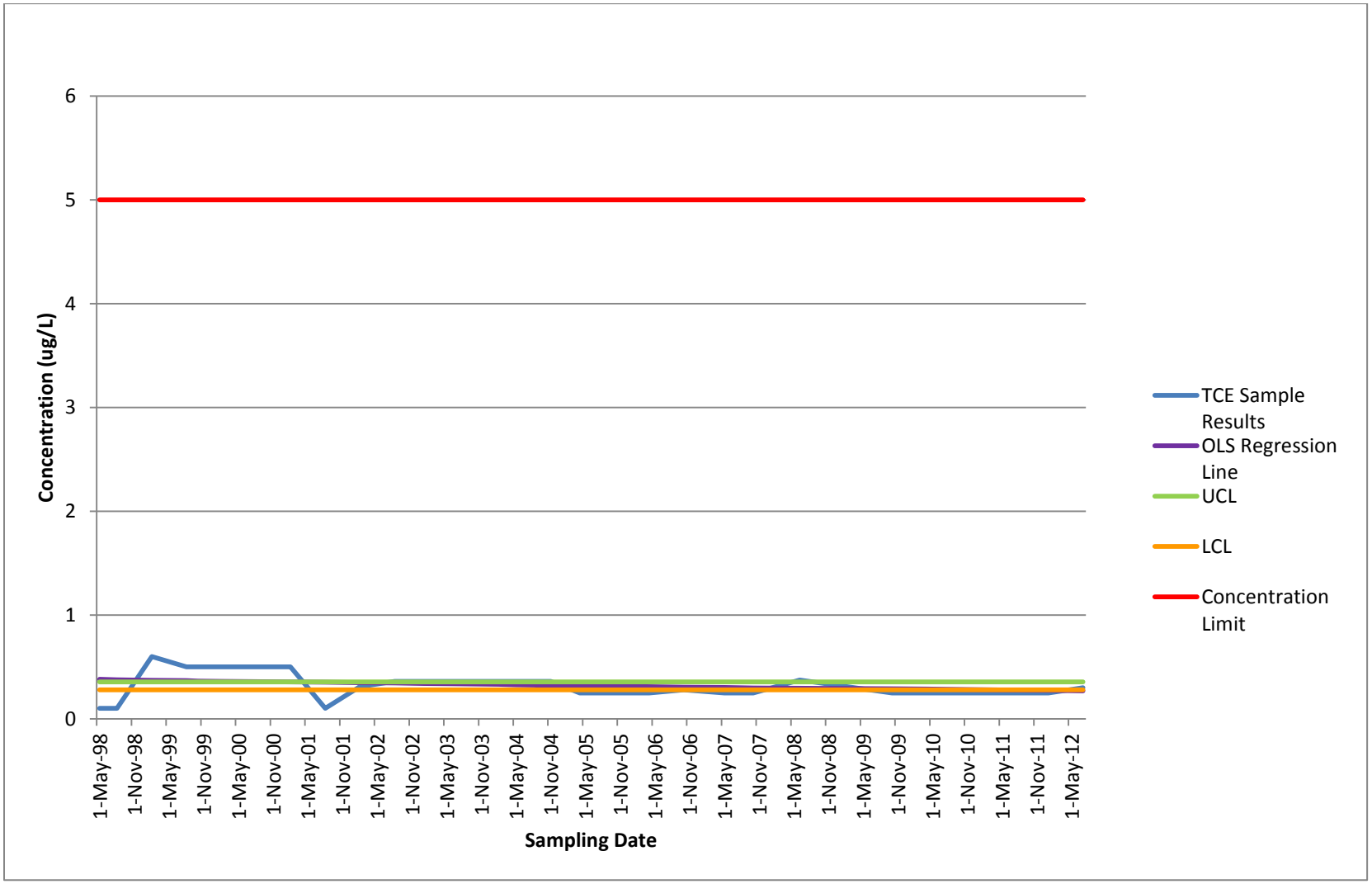

Figure 4-3
TCE Control Chart for CWL-BW5/4A

Median Test

The cumulative percentage of sample results greater than the median (i.e., Median Test) for the three hazardous constituents is below 80%. Therefore, there is no statistically significant evidence of increasing contamination for any of the hazardous constituents. The Median Test result for nickel, 50%, is typical for a consistent data set characterized by detections that reflect limited natural variation. The low median test results for both chromium and TCE (27% and 12%, respectively) reflect a data set influenced by non-detection results and an analytical laboratory detection limit that has decreased over time.

In addition, the ordinary least squares (OLS) regression line is shown on Figures 4-1 through 4-3. This line provides a visual representation of the overall trend of the sample results. As shown in Figures 4-1 through 4-3, all three hazardous constituents show a slight decreasing trend, consistent with the Median Test results.

4.4 Hydrogeologic Assessment

The regional aquifer in the area of the CWL is located within the Santa Fe Group alluvial sediments at a depth of approximately 485 to 500 feet bgs. Regional groundwater beneath Kirtland Air Force Base (KAFB) flows generally westward away from the mountains toward the Rio Grande. Pumping by the City of Albuquerque and KAFB have modified the natural groundwater flow regime and resulted in a steady decline of the upper surface of the regional aquifer. Water levels at the CWL have been declining since monitoring began at the CWL in the 1985. The average rate of decline has been somewhat variable over time, but typically in the range of 0.4 to 0.8 feet per year. The groundwater elevation decline between October 2011 and October 2012 at the CWL wells ranged from 0.33 (CWL-MW11) to 0.72 (CWL-MW10).

In CY 2012, water levels were measured in all wells on a quarterly basis, and during the January and July semi-annual sampling events. Figure 4-4 is the potentiometric surface map of the regional aquifer beneath the CWL, based upon October 2012 water level measurements. Based on this map the local groundwater flow direction is to the north, west, and south in the northern, central, and southern parts of the site, respectively. This pattern is generally consistent with the hydrogeologic conceptual model for the KAFB area. Localized changes in the water table surface reflect site-specific geologic controls (i.e., vertical and lateral changes in the saturated Santa Fe Group alluvial sediments). The horizontal gradient ranges from approximately 0.006 to 0.011. Groundwater velocities were calculated using the current potentiometric surface gradient, representative hydraulic conductivity data, and an effective porosity of 29 percent (SNL/NM October 1995). The calculated velocity ranges from approximately 5.8×10^{-4} to 1.1×10^{-3} feet per day (2.0×10^{-7} to 3.0×10^{-7} centimeters per second). This very low velocity range is consistent with previous CWL estimates for horizontal groundwater flow.

During 2012 slug tests were performed on the four groundwater monitoring wells to determine the hydraulic conductivity of the aquifer in these locations. This testing is not required by the PCCP but part of the normal routine for groundwater monitoring wells installed at SNL/NM. The testing was completed in August and the data are currently being processed and evaluated. Results will be presented in the CY2013 Annual Report.

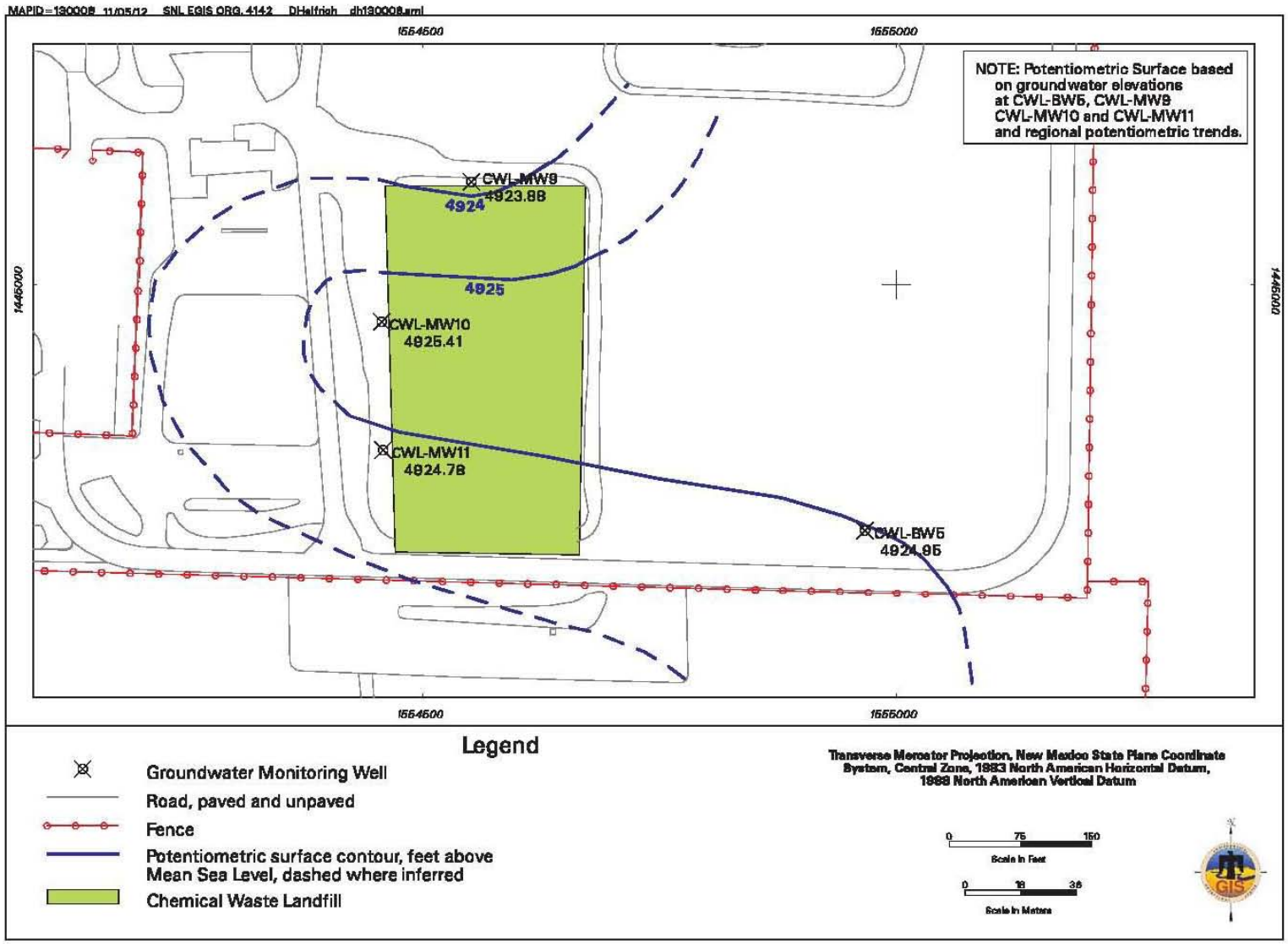

Figure 4-4
Potentiometric Surface of the Regional Aquifer at the Chemical Waste Landfill, October 2012

5.0 SOIL-GAS MONITORING RESULTS

This chapter presents soil-gas monitoring activities (i.e., sampling and analysis), analytical results, and data evaluation for CY 2012 in accordance with CWL PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 3. The CY 2012 annual soil-gas sampling event was the first performed under the PCCP, which became effective June 2, 2011. Soil-gas sampling field activities are described in Section 5.1, analytical laboratory results and a discussion of data quality are presented in Section 5.2, and data evaluation requirements and results are presented in Section 5.3. A summary of soil-gas monitoring activities and results is provided in Section 8.1.

5.1 Soil-Gas Sampling Field Activities

This section describes soil-gas monitoring activities conducted at the CWL in conformance with the CWL Soil-Gas SAP, PCCP Attachment 3 (NMED October 2009 and subsequent revisions) that describes the procedures, methods, and analytical protocols for collecting and analyzing soil-gas samples. The DQO for soil-gas monitoring is to collect accurate and defensible data of high quality to assess the concentrations of hazardous constituents at various depths in the vadose zone at the CWL (i.e., unsaturated soil and sediments above the regional groundwater aquifer). Field forms and documentation that address calibration of equipment, well evacuation, purge volumes, and vacuum pressure readings for each sample container are provided in Annex B of this report and filed in the SNL/NM Records Center.

Soil-gas samples were collected from monitoring wells CWL-UI-1, CWL-UI-2, CWL-D1, CWL-D2, and CWL-D3 in January. Supplemental soil-gas sampling (well/port-specific) was performed in March and May 2012. The three sampling events are summarized below.

- January – Initial annual soil-gas sampling event. All wells and ports sampled (including collection of duplicate samples), except for the 440 foot bgs sampling port at well CWL-D3 (i.e., CWL-D3-440). During sampling this port was discovered to be blocked/obstructed and could not be sampled.

- March – CWL-D3-440 rehabilitation and sampling. On March 5 the Department of Energy (DOE) and Sandia proposed a CWL-D3-440 sampling port rehabilitation plan and requested direction from NMED (SNL/NM March 2012). In accordance with NMED direction, the sampling port was reopened using pressurized ultra-pure grade nitrogen on March 22. A preliminary sample was collected immediately after opening and purging the port on March 22. The environmental sample was collected 7 days later on March 29 in accordance with NMED direction.

- May – Duplicate Resampling due to RPD issue. Two sampling ports (CWL-UI2-36 and well CWL-D3-480) were resampled in May because specific constituents failed the RPD requirement in the January environmental-duplicate pair samples.

Samples collected from all wells/sampling ports were analyzed using the EPA TO-14 analytical method for the 50 VOCs listed in PCCP Attachment 1, Table 1-5. Duplicate samples were collected from CWL-UI2, CWL-D1, and CWL-D3 at selected sample depths. Details of the CY2012 soil-gas sampling event under the CWL PCCP are described in the following sections.

5.1.1 Well Evacuation

Purging removes stagnant air from each monitoring well port and sample tubing, allowing the collection of representative soil gas from the soil pore space surrounding the sampling port in the subsurface. In accordance with the SAP, the minimum purge requirement is 30 minutes for monitoring activities prior to February 2012 (i.e., prior to NMED approval of the November 2011 permit modification request) and three tubing volumes afterwards. Purging continued after meeting minimum requirements until field measurements for VOC levels stabilized in accordance with PCCP Attachment 3, Section 3.9.2. VOCs were measured by attaching a VOC monitoring instrument to the exhaust port of the vacuum pump.

The CWL soil-gas sampling equipment includes a vacuum pump, a sampling manifold assembly, and a multiport purging chamber. The multiport purging chamber is equipped with individual valves, fittings, and tubing that can be connected to up to ten individual sample ports. Valves were connected to each sampling port and purging was performed until minimum purge requirements were satisfied. Upon completion of purging, soil-gas samples were collected in SUMMA® canisters per laboratory protocols and sent to the off-site laboratory for analysis.

5.1.2 Field Quality Control

Field QC samples include environmental duplicate samples (minimum of two per annual monitoring event) and field blank samples. Field QC samples were submitted for analysis with the soil-gas samples and analytical results are presented in Section 5.2.2 and Annex B.

Duplicate environmental samples are collected immediately after the original environmental sample in order to reduce variability caused by time and/or sampling mechanics. These sample results are used to evaluate the reproducibility of the sampling and analytical processes. During the January sampling event duplicate environmental samples were collected from monitoring wells CWL-UI2-36, CWL-D1-160, and CWL-D3-480 (three total duplicate samples). Duplicate samples were analyzed for the full list of TO-14 constituents. Resampling based on RPD requirements at CWL-UI2-36 and CWL-D3-440 was conducted in May.

Field QC blank samples are prepared in the field during sampling activities by collecting an ultra-pure grade nitrogen gas sample. Results are used to assess whether contamination of the samples may have resulted from ambient field conditions. A total of eight QC field blank samples were submitted for analysis with CY 2012 environmental samples (five in January, one in March, and two in May).

5.1.3 Waste Management

Only a small volume of solid waste (personal protective equipment) was generated during the three soil-gas monitoring events. This waste was combined with the groundwater monitoring

solid waste and managed as hazardous waste. This waste was submitted to the Hazardous Waste Management Facility for ultimate disposal at a permitted off-site facility.

5.2 Laboratory Results

Soil-gas samples were submitted to Test America, Inc. in Los Angeles, California for chemical analyses by EPA Method TO-14. Analytical reports (i.e., certificates of analyses), analytical methods, method detection limits (MDLs), reporting limits (RLs), dates of analyses, results of field QC analyses, and data validation reports are included in Annex B and filed in the SNL/NM Records Center.

5.2.1 Environmental Sample Results

Table 5-1 summarizes detected VOCs from soil-gas samples collected in CY 2012. Detected VOCs included acetone, chloroethane, chloroform, dichlorodifluoromethane, 1,1-dichloroethene (1,1-DCE), 1,2-dichloropropane, methylene chloride, tetrachlorethene, toluene, 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113), TCE, trichlorofluoromethane (Freon 11), 4-methyl-2-pentanone, and m,p-xylene. TCE was detected in all samples at reported concentrations ranging from 61 parts per billion by volume (ppbv) at CWL-D3 (480 foot bgs sample port) to 22,000 ppbv at CWL-D1 (240 foot bgs sample port). No soil-gas concentrations from the three deepest sampling ports (CWL-D1-470, CWL-D2-470, CWL-D3-480) exceeded the trigger level of 20 ppmv, and only two VOCs exceeded 0.5 ppmv (TCE at CWL-D1-470 and CWL-D2-470 and 1,1,2-trichloro-1,2,2-trifluoroethane at CWL-D2-470).

The March sampling of the CWL-D3-440 involved the collection of two samples. A preliminary sample was collected immediately after the port was reopened using pressurized ultra-pure grade nitrogen on March 22. In accordance with NMED direction on March 5, the environmental sample was collected 7 days later on March 29. The sample port and tubing were purged to remove greater than 3 tubing volumes of air prior to sample collection. Results of the two samples were very similar, with concentrations generally being higher in the March 29 sample. TCE and 1,1,2-trichloro-1,2,2-trifluoroethane concentrations were 5.9 and 1.1 ppmv in the preliminary sample, and 6.8 and 1.1 ppmv in the environmental sample. Several other VOCs were detected in both samples at concentrations less than 1 ppmv. Only the March 29 analytical results are presented in Table 5-1.

In May 2012, SNL/NM personnel resampled two monitoring wells because the duplicate samples collected during January 2012 failed the RPD requirement of less than 20% for specific constituents. The original January and May resample results (environmental and duplicate sample pairs) for wells CWL-UI2-36 and CWL-D3-480 are presented in Tables 5-1 and 5-2, and discussed in the Section 5.2.2.

5.2.2 Field Quality Control Sample Results

Table 5-2 presents field duplicate results for samples collected from wells CWL-UI2-36, CWL-D1-160, and CWL-D3-480 and RPD calculations that were performed for all detected compounds that are reported at concentrations exceeding the analytical laboratory reporting

Table 5-1
Summary of Detected Volatile Organic Compounds
Chemical Waste Landfill Soil-Gas Monitoring
Analytical Method TO-14A[a]
Calendar Year 2012

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier[b]	Validation Qualifier[b]	Sample Number
CWL-UI1-40	Chloroform	940	77	150	--	--	091655-001
25-Jan-12	1,1-Dichloroethene	250	77	150	--	--	091655-001
	Tetrachloroethene	4200	77	150	--	--	091655-001
	Trichloroethene	5200	77	150	--	--	091655-001
	Trichlorofluoromethane	240	77	150	--	--	091655-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	930	77	150	--	--	091655-001
	Total Organics[c]	11760	NA	NA	NA	NA	091655-001
CWL-UI1-80	Chloroform	670	110	210	--	--	091656-001
25-Jan-12	1,1-Dichloroethene	430	110	210	--	--	091656-001
	Methylene Chloride	130	110	210	J	--	091656-001
	Tetrachloroethene	1200	110	210	--	--	091656-001
	Trichloroethene	6500	110	210	--	--	091656-001
	Trichlorofluoromethane	250	110	210	--	--	091656-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	110	210	--	--	091656-001
	Total Organics[c]	10180	NA	NA	NA	NA	091656-001
CWL-UI1-120	Chloroform	480	110	230	--	--	091657-001
25-Jan-12	1,1-Dichloroethene	470	110	230	--	--	091657-001
	Methylene Chloride	250	110	230	--	--	091657-001
	Tetrachloroethene	880	110	230	--	--	091657-001
	Trichloroethene	7700	110	230	--	--	091657-001
	Trichlorofluoromethane	290	110	230	--	--	091657-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	110	230	--	--	091657-001
	Total Organics[c]	11070	NA	NA	NA	NA	091657-001
CWL-UI2-36	Chloroform	550	42	84	--	--	091659-001
25-Jan-12	Tetrachloroethene	180	42	84	--	--	091659-001
	Trichloroethene	3100	42	84	--	--	091659-001
	Trichlorofluoromethane	180	42	84	--	--	091659-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	630	42	84	--	--	091659-001
	Total Organics[c]	4640	NA	NA	NA	NA	091659-001
CWL-UI2-36 (Duplicate)	Chloroform	510	43	87	--	--	091660-001
25-Jan-12	Tetrachloroethene	170	43	87	--	--	091660-001
	Trichloroethene	3000	43	87	--	--	091660-001
	Trichlorofluoromethane	140	43	87	--	--	091660-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	580	43	87	--	--	091660-001
	Total Organics[c]	4400	NA	NA	NA	NA	091660-001

Refer to footnotes at end of table.

Table 5-1 *(Continued)*
Summary of Detected Volatile Organic Compounds
Chemical Waste Landfill Soil-Gas Monitoring
Analytical Method TO-14A[a]
Calendar Year 2012

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier[b]	Validation Qualifier[b]	Sample Number
CWL-UI2-36 (Re-sample) 07-May-12	Chloroform	600	36	73	--	--	092337-001
	Dichlorodifluoromethane	41	36	73	J	--	092337-001
	Tetrachloroethene	190	36	73	--	--	092337-001
	Trichloroethene	3200	36	73	--	--	092337-001
	Trichlorofluoromethane	220	36	73	--	--	092337-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	790	36	73	--	--	092337-001
	Total Organics[c]	5041	NA	NA	NA	NA	092337-001
CWL-UI2-36 (Re-sample Duplicate) 07-May-12	Chloroform	570	44	89	--	--	092338-001
	Tetrachloroethene	190	44	89	--	--	092338-001
	Trichloroethene	3200	44	89	--	--	092338-001
	Trichlorofluoromethane	210	44	89	--	--	092338-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	760	44	89	--	--	092338-001
	Total Organics[c]	4930	NA	NA	NA	NA	092338-001
CWL-UI2-76 25-Jan-12	Chloroform	780	72	140	--	--	091661-001
	Tetrachloroethene	230	72	140	--	--	091661-001
	Trichloroethene	5600	72	140	--	--	091661-001
	Trichlorofluoromethane	240	72	140	--	--	091661-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	72	140	--	--	091661-001
	Total Organics[c]	7850	NA	NA	NA	NA	091661-001
CWL-UI2-136 25-Jan-12	Chloroform	670	110	220	--	--	091662-001
	1,1-Dichloroethene	270	110	220	--	--	091662-001
	1,2-Dichloropropane	130	110	270	J	--	091662-001
	Tetrachloroethene	280	110	220	--	--	091662-001
	Trichloroethene	8500	110	220	--	--	091662-001
	Trichlorofluoromethane	300	110	220	--	--	091662-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	110	220	--	--	091662-001
	Total Organics[c]	11450	NA	NA	NA	NA	091662-001
CWL-D1-100 26-Jan-12	Chloroform	560	110	220	--	--	091664-001
	1,1-Dichloroethene	480	110	220	--	--	091664-001
	Tetrachloroethene	1200	110	220	--	--	091664-001
	Trichloroethene	10000	110	220	--	--	091664-001
	Trichlorofluoromethane	300	110	220	--	--	091664-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	110	220	--	--	091664-001
	Total Organics[c]	13840	NA	NA	NA	NA	091664-001

Refer to footnotes at end of table.

Table 5-1 *(Continued)*
Summary of Detected Volatile Organic Compounds
Chemical Waste Landfill Soil-Gas Monitoring
Analytical Method TO-14A[a]
Calendar Year 2012

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier[b]	Validation Qualifier[b]	Sample Number
CWL-D1-160	Chloroform	530	220	440	--	--	091665-001
26-Jan-12	1,1-Dichloroethene	760	220	440	--	--	091665-001
	Tetrachloroethene	790	220	440	--	--	091665-001
	Trichloroethene	14000	220	440	--	--	091665-001
	Trichlorofluoromethane	400	220	440	J	--	091665-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	2000	220	440	--	--	091665-001
	Total Organics[c]	18480	NA	NA	NA	NA	091665-001
CWL-D1-160 (Duplicate)	Chloroform	490	220	440	--	--	091666-001
26-Jan-12	1,1-Dichloroethene	700	220	440	--	--	091666-001
	Tetrachloroethene	710	220	440	--	--	091666-001
	Trichloroethene	14000	220	440	--	--	091666-001
	Trichlorofluoromethane	280	220	440	J	--	091666-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	2000	220	440	--	--	091666-001
	Total Organics[c]	18180	NA	NA	NA	NA	091666-001
CWL-D1-240	Tetrachloroethene	460	310	620	J	--	091667-001
26-Jan-12	Trichloroethene	22000	310	620	--	--	091667-001
	Total Organics	22460	NA	NA	NA	NA	091667-001
CWL-D1-350	1,1-Dichloroethene	900	140	280	--	--	091668-001
26-Jan-12	Trichloroethene	13000	140	280	--	--	091668-001
	Trichlorofluoromethane	460	140	280	--	--	091668-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	2200	140	280	--	--	091668-001
	Total Organics[c]	16560	NA	NA	NA	NA	091668-001
CWL-D1-470	Dichlorodifluoromethane	10	6.2	12	J	--	091669-001
26-Jan-12	1,1-Dichloroethene	55	6.2	12	--	--	091669-001
	Methylene Chloride	12	6.2	12	--	--	091669-001
	Tetrachloroethene	10	6.2	12	J	--	091669-001
	Trichloroethene	510[d]	6.2	12	--	--	091669-001
	Trichlorofluoromethane	51	6.2	12	--	--	091669-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	220	6.2	12	--	--	091669-001
	Total Organics[c]	868	NA	NA	NA	NA	091669-001
CWL-D2-120	Chloroform	550	240	470	--	--	091671-001
27-Jan-12	1,1-Dichloroethene	840	240	470	--	--	091671-001
	Tetrachloroethene	540	240	470	--	--	091671-001
	Trichloroethene	16000	240	470	--	--	091671-001
	Trichlorofluoromethane	470	240	470	--	--	091671-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	2300	240	470	--	--	091671-001
	Total Organics[c]	20700	NA	NA	NA	NA	091671-001

Refer to footnotes at end of table.

Table 5-1 *(Continued)*
Summary of Detected Volatile Organic Compounds
Chemical Waste Landfill Soil-Gas Monitoring
Analytical Method TO-14A[a]
Calendar Year 2012

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier[b]	Validation Qualifier[b]	Sample Number
CWL-D2-240	Chloroform	470	270	530	J	--	091672-001
27-Jan-12	1,1-Dichloroethene	950	270	530	--	--	091672-001
	Tetrachloroethene	470	270	530	J	--	091672-001
	Trichloroethene	18000	270	530	--	--	091672-001
	Trichlorofluoromethane	510	270	530	J	--	091672-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	2500	270	530	--	--	091672-001
	Total Organics[c]	22900	NA	NA	NA	NA	091672-001
CWL-D2-350	Chloroform	220	130	250	J	--	091673-001
27-Jan-12	1,1-Dichloroethene	260	130	250	--	--	091673-001
	Methylene Chloride	130	130	250	J	--	091673-001
	Trichloroethene	11000	130	250	--	--	091673-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1700	130	250	--	--	091673-001
	Total Organics[c]	13310	NA	NA	NA	NA	091673-001
CWL-D2-440	Dichlorodifluoromethane	24	22	44	J	--	091674-001
27-Jan-12	1,1-Dichloroethene	170	22	44	--	--	091674-001
	Tetrachloroethene	52	22	44	--	--	091674-001
	Trichloroethene	1800	22	44	--	--	091674-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	550	22	44	--	--	091674-001
	Total Organics[c]	2596	NA	NA	NA	NA	091674-001
CWL-D2-470	Chloroform	170	15	30	--	--	091675-001
27-Jan-12	Dichlorodifluoromethane	30	15	30	--	--	091675-001
	1,1-Dichloroethene	290	15	30	--	--	091675-001
	1,2-Dichloropropane	44	15	38	--	--	091675-001
	Tetrachloroethene	190	15	30	--	--	091675-001
	Trichloroethene	4100[d]	85	170	--	--	091675-001
	Trichlorofluoromethane	190	15	30	--	--	091675-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	770[d]	15	30	--	--	091675-001
	Total Organics[c]	5784	NA	NA	NA	NA	091675-001
CWL-D3-120	Chloroform	190	84	170	--	--	091677-001
30-Jan-12	1,1-Dichloroethene	370	84	170	--	--	091677-001
	Tetrachloroethene	170	84	170	--	--	091677-001
	Trichloroethene	7000	84	170	--	--	091677-001
	Trichlorofluoromethane	260	84	170	--	--	091677-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1200	84	170	--	--	091677-001
	Total Organics[c]	9190	NA	NA	NA	NA	091677-001

Refer to footnotes at end of table.

Table 5-1 *(Continued)*
Summary of Detected Volatile Organic Compounds
Chemical Waste Landfill Soil-Gas Monitoring
Analytical Method TO-14A[a]
Calendar Year 2012

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier[b]	Validation Qualifier[b]	Sample Number
CWL-D3-170	Chloroform	220	110	220	--	--	091678-001
30-Jan-12	1,1-Dichloroethene	480	110	220	--	--	091678-001
	1,2-Dichloropropane	150	110	220	J	--	091678-001
	Tetrachloroethene	180	110	270	J	--	091678-001
	Trichloroethene	7900	110	220	--	--	091678-001
	Trichlorofluoromethane	340	110	220	--	--	091678-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	110	220	--	--	091678-001
	Total Organics[c]	10570	NA	NA	NA	NA	091678-001
CWL-D3-350	Chloroform	200	120	250	J	--	091679-001
30-Jan-12	1,1-Dichloroethene	590	120	250	--	--	091679-001
	1,2-Dichloropropane	180	120	310	J	--	091679-001
	Methylene Chloride	960	120	250	--	--	091679-001
	Tetrachloroethene	190	120	250	J	--	091679-001
	Trichloroethene	8800	120	250	--	--	091679-001
	Trichlorofluoromethane	380	120	250	--	--	091679-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1600	120	250	--	--	091679-001
	Total Organics[c]	12900	NA	NA	NA	NA	091679-001
CWL-D3-440	Chloroform	150	97	190	J	--	091962-001
29-Mar-12	1,1-Dichloroethene	370	97	190	--	--	091962-001
	Methylene Chloride	780	97	190	--	--	091962-001
	Tetrachloroethene	170	97	190	J	--	091962-001
	Trichloroethene	6800	97	190	--	--	091962-001
	Trichlorofluoromethane	320	97	190	--	--	091962-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	1100	97	190	--	--	091962-001
	Total Organics[c]	9690	NA	NA	NA	NA	091962-001
CWL-D3-480	Acetone	10	5.4	13	J	--	091681-001
30-Jan-12	Chloroform	13	2.7	5.4	--	--	091681-001
	1,1-Dichloroethene	13	2.7	5.4	--	--	091681-001
	1,2-Dichloropropane	3.0	2.7	6.7	J	--	091681-001
	Methylene Chloride	3.6	2.7	5.4	J	--	091681-001
	Trichloroethene	210	2.7	5.4	--	--	091681-001
	Trichlorofluoromethane	11	2.7	5.4	--	--	091681-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	35	2.7	5.4	--	--	091681-001
	Total Organics[c]	298.6	NA	NA	NA	NA	091681-001

Refer to footnotes at end of table.

Table 5-1 *(Concluded)*
Summary of Detected Volatile Organic Compounds
Chemical Waste Landfill Soil-Gas Monitoring
Analytical Method TO-14A[a]
Calendar Year 2012

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier[b]	Validation Qualifier[b]	Sample Number
CWL-D3-480 (Duplicate) 30-Jan-12	Acetone	27	4.0	10	--	--	091682-001
	Chloroethane	5.6	2.0	4.0	--	--	091682-001
	Chloroform	8.7	2.0	4.0	--	--	091682-001
	1,1-Dichloroethene	8.6	2.0	4.0	--	--	091682-001
	Methylene Chloride	4.5	2.0	4.0	--	--	091682-001
	Tetrachloroethene	4.3	2.0	4.0	--	--	091682-001
	Toluene	82	2.0	4.0	--	--	091682-001
	Trichloroethene	130	2.0	4.0	--	--	091682-001
	Trichlorofluoromethane	7.3	2.0	4.0	--	--	091682-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	24	2.0	4.0	--	--	091682-001
	m,p-Xylene	2.5	2.0	4.0	J	--	091682-001
	Total Organics[c]	304.5	NA	NA	NA	NA	091682-001
CWL-D3-480 (Re-sample) 07-May-12	Chloroform	3.4	2.0	4.0	J	--	092339-001
	1,1-Dichloroethene	4.3	2.0	4.0	--	--	092339-001
	4-Methyl-2-pentanone	2.0	2.0	10	J	--	092339-001
	Tetrachloroethene	2.1	2.0	4.0	J	--	092339-001
	Trichloroethene	67	2.0	4.0	--	--	092339-001
	Trichlorofluoromethane	4.2	2.0	4.0	--	--	092339-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	12	2.0	4.0	--	--	092339-001
	Total Organics[c]	90.8	NA	NA	NA	NA	092339-001
CWL-D3-480 (Re-sample Duplicate)07-May-12	Chloroform	3.2	2.0	4.0	J	--	092340-001
	Trichloroethene	61	2.0	4.0	--	--	092340-001
	Trichlorofluoromethane	3.7	2.0	4.0	J	--	092340-001
	1,1,2-Trichloro-1,2,2-trifluoroethane	11	2.0	4.0	--	--	092340-001
	Total Organics[c]	78.9	NA	NA	NA	NA	092340-001

Notes:
[a]Analytical Method EPA 1999, "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-14A" Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.
[b]Laboratory/Validation Qualifier - Blank (--) cell = all quality control samples met acceptance criteria. "J" and "U," see below.
[c]Total Organics -- sum of validated detected organic compounds.
[d]Detected value >500 ppbv in deepest well ports. Upper and lower confidence limits about the mean at a 95% confidence level are presented in Section 5.3.
EPA = U.S. Environmental Protection Agency.
J = Estimated value. Analyte detected at a level below the practical quantitation limit or reporting limit (RL) and greater than or equal to the MDL.
MDL = Method detection limit. The minimum concentration that can be measured and reported with 99% confidence that the analyte is present (i.e., greater than zero).
NA = Not applicable.
ppbv = parts per billion by volume basis
RL = Reporting limit. Minimum concentration that can be reported with a statistically established degree of confidence.

Table 5-2
Summary of Duplicate Samples
Chemical Waste Landfill Soil-Gas Monitoring
Calendar Year 2012

Well ID / Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD[a]
	(ppbv)		
January 2012 Duplicate Sample Results			
CWL-UI2-36			
Chloroform	550	510	8
Tetrachloroethene	180	170	6
Trichloroethene	3100	3000	3
Trichlorofluoromethane	180	140	**25**
1,1,2-Trichloro-1,2,2-trifluoroethane	630	580	8
CWL-D1-160			
Chloroform	530	490	8
1,1-Dichloroethene	760	700	8
Tetrachloroethene	790	710	11
Trichloroethene	14000	14000	< 1
1,1,2-Trichloro-1,2,2-trifluoroethane	2000	2000	< 1
CWL-D3-480			
Chloroform	13	8.7	**40**
1,1-Dichloroethene	13	8.6	**41**
Trichloroethene	210	130	**47**
Trichlorofluoromethane	11	7.3	**40**
1,1,2-Trichloro-1,2,2-trifluoroethane	35	24	**37**
May 2012 Duplicate Resample Results			
CWL-UI2-36 (Re-sample)			
Chloroform	600	570	5
Tetrachloroethene	190	190	< 1
Trichloroethene	3200	3200	< 1
Trichlorofluoromethane	220	210	5
1,1,2-Trichloro-1,2,2-trifluoroethane	790	760	4
CWL-D3-480 (Re-sample)			
Trichloroethene	67	61	9
1,1,2-Trichloro-1,2,2-trifluoroethane	12	11	9

[a]RPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number. Bolded values exceed acceptance criterion of less than 20%.

$$RPD = \frac{|R_1 - R_2|}{[(R_1 + R_2)/2]} \times 100$$

where: R_1 = Analysis result.
R_2 = Duplicate analysis result.

ppbv = parts per billion by volume

limit (RL) (i.e., detections below the RL that are qualified as "estimated" are not used for RPD calculations). If a detected compound in one sample is not detected in the corresponding duplicate or environmental sample, no RPD was calculated. In accordance with PCCP Attachment3, Section 3.6, the acceptance criterion for soil-gas RPDs is 20% or less and resampling is required if this criterion is exceeded.

The duplicate sample results from CWL-D1-160 show good agreement; all RPD values are less than 20. RPDs for various VOCs were outside acceptable QC limits in CWL-UI2-36 and CWL-D3-480 samples (Table 5-2, January 2012 Duplicate Sample Results). In May 2012, SNL/NM personnel resampled CWL-UI2-36 and CWL-D3-480. RPD values for the resamples (environmental and duplicate pairs) were all within acceptable limits (Table 5-2, May 2012 Duplicate Sample Results).

A total of eight field blank samples were submitted with CY 2012 samples. No VOCs were detected above laboratory MDLs except for methylene chloride. Methylene chloride was detected in the May 2012 field blank sample at a concentration of 2.1 ppbv. No corrective action was required since the compound was reported in associated environmental samples at concentrations greater than ten times the field blank result.

5.2.3 Data Quality

Field QC sample results met the sampling DQOs and validated the adequacy of the field sampling procedures and protocol. Internal laboratory QC samples, including method blanks and duplicate laboratory control samples, were analyzed concurrently with CWL soil-gas samples. The data were reviewed and qualified in accordance with AOP 00-03, "Data Validation Procedure for Chemical and Radiochemical Data" (SNL/NM May 2011).

No significant data quality problems were noted for project contaminants of concern. The compound benzyl chloride was qualified during data validation as unusable in the CWL-D3-440 sample. However, benzyl chloride is not a CWL soil-gas contaminant of concern and was not detected in any CY 2012 soil-gas samples.

5.2.4 Variances and Non-Conformances

There were no variances, one nonconformance, and one project-specific issue noted during the CY 2012 soil-gas activities. The nonconformance involved RPDs for various VOCs that were outside the acceptable QC limit in January 2012 duplicate samples from CWL-UI2-36 and CWL-D3-480. In May 2012, these locations were resampled in accordance with PCCP requirements and all RPD values were within acceptable limits.

The one project-specific issue involved the obstructed sampling port (CWL-D3-440) discovered in January 2012 by sampling personnel. The port could not be sampled in January, most likely due to an obstruction in the screen interval. In March 2012 after receiving direction from NMED, the sample port was opened using pressurized ultra-pure grade nitrogen gas, which cleared the obstruction within the sampling port screen. The environmental sample was collected seven-days afterwards in accordance with NMED direction received on March 5, 2012 (SNL/NM March 2012).

5.3 Data Evaluation

Soil-gas monitoring is required to determine whether the groundwater beneath the CWL is adequately protected in support of the CWL groundwater monitoring program. In accordance with PCCP Attachment 1, Section 1.8.2.2, statistical evaluation of soil-gas results for specific VOCs that exceed 0.50 ppmv from the three deepest sampling ports of wells CWL-D1 through CWL-D3 (i.e., CWL-D1-470, CWL-D2-470, and CWL-D3-480) are required annually, and include the following:

- calculate the UCL and LCL about the mean at a 95% confidence level using current data and historic data since completion of the VE VCM, and
- compare the LCL to the trigger level of 20 ppmv.

For the first 5 years after the effective date of the PCCP (June 2, 2011), historical soil-gas monitoring results are used to augment the statistical analysis. After June 2, 2016, only soil-gas data collected under the PCCP will be used. Historical soil-gas data used and presented in Section 5.4 includes results from June 1998, June 1999, August 2001, June 2004, and September 2004. Although the VE VCM was completed in July 1998, the June 1998 data set is included as it is representative of the conditions when the VE system was shut down a month later.

5.3.1 Statistical Assessment Requirements

Based upon the soil-gas monitoring results presented in Table 5-1, TCE in samples from CWL-D1-470 and CWL-D2-470 and Freon 113 (1,1,2-trichloro-1,2,2-trifluoroethane) in the sample from CWL-D2-470 exceeded the threshold value of 0.50 ppmv. As a result, confidence intervals (UCLs and LCLs) are calculated and used to compare to the trigger level of 20 ppmv. If a result is below the analytical laboratory detection limit, the MDL for the constituent is used for statistical analysis.

5.3.2 Statistical Assessment Results

CY 2012 soil-gas statistical assessment results are presented in Table 5-3. The LCLs for TCE and Freon 113 are below the trigger level of 20 ppmv. The highest LCL value was 1.64 ppmv for TCE at CWL-D2-470.

5.4 Historic Data Evaluation

In accordance with PCCP Attachment 1, Section 1.12 and Attachment 3, Section 3.11, current soil-gas monitoring results are compared and evaluated with respect to historic results since completion of the VE VCM. This allows for long-term trends to be defined and provides for more meaningful interpretations of current results with respect to historic data. Tables 5-4 and 5-5 present TCE and Total VOCs soil-gas monitoring results, respectively, for the post-closure care monitoring network. Data sets included range from June 1998 (representative of the end of the VE VCM) to January 2012.

Table 5-3
Chemical Waste Landfill Soil-Gas Monitoring
Statistical Assessment Results Summary
Calendar Year 2012

Soil-Gas Constituent Exceeding Threshold Concentration[a]	Minimum[b] (ppmv)	Maximum[b] (ppmv)	Mean[c] (ppmv)	Standard Deviation[c]	LCL[c] (ppmv)	UCL[c] (ppmv)	Distribution Type[c]	Trigger Level[a] (ppmv)	Trigger Level Exceeded[a]?
TCE (0.51 ppmv) CWL-D1-470	0.077	0.51	0.26	0.14	0.14	0.37	Normal	20	No
TCE (4.1 ppmv) CWL-D2-470	0.94	5.8	3.26	1.97	1.64	4.88	Normal	20	No
1,1,2-Trichloro-1,2,2-trifluoroethane (0.77 ppmv) CWL-D2-470	0.39	1.2	0.76	0.33	0.46	1.08	Normal	20	No

Notes:

[a]CWL Permit Attachment 1, Section 1.8.2.2, defines the threshold concentration (0.50 ppmv) and trigger level (20 ppmv). The 0.50 ppmv threshold concentration applies to only soil-gas constituents detected in the three deepest sampling ports of wells CWL-D1 through CWL-D3.
[b]Minimum and maximum results determined from historical data, including the CY 2012 results.
[c]Mean, standard deviation, LCL, UCL, and Distribution Type determined using PRO-UCL statistical program.
[d]Exceedance determined by comparing the constituent LCL against the trigger level of 20 ppmv.
LCL = Lower confidence limit.
ppmv = Parts per million by volume.
TCE = Trichloroethene.
UCL = Upper confidence limit.

Table 5-4
Historic Soil-Gas Monitoring Summary – TCE Concentrations (ppmv)
EPA Method TO-14A[a]
Chemical Waste Landfill

Well ID & Sample Port Depth[b]	June 1998	June 1999	August 2001	June 2004	September 2004	January 2012
CWL-UI1-40	4.5	16.0 / 14.0[c]	7.9	3.8	4.0	5.2
CWL-UI1-80	0.19	4.9	6.7	5.9	6.1	6.5
CWL-UI1-120	3.0	5.9	9.1	6.0	14.0	7.7
CWL-UI2-36	0.037	0.70 / 0.64[c]	ND	1.6	ND	3.1
CWL-UI2-80	0.091	1.0	2.4	3.4	4.1	5.6
CWL-UI2-136	5.5	1.9	4.6	3.0	1.9	8.5
CWL-D1-100	0.220	2.5	7.1	9.8	13.0	10.0
CWL-D1-160	120.0	14.0	21.0	25.0	29.0	14.0
CWL-D1-240	160.0 / 130.0[c]	44.0	44.0	34.0	34.0	22.0
CWL-D1-350	0.013	11.0	19.0	13.0	22.0	13.0
CWL-D1-470	0.077	0.17	0.25	0.25	0.27	0.51
CWL-D2-120	3.1	21.0	20.0	22.0	25.0	16.0
CWL-D2-240	ND	40.0 / 35.0[c]	38.0	26.0	13.0	18.0
CWL-D2-350	0.064	12.0	18.0	11.0	17.0	11.0
CWL-D2-440	0.082	1.0	7.6	2.5	5.9	1.8
CWL-D2-470	ND	0.94	5.8	3.1	4.6	4.1
CWL-D3-120	0.009	1.1	4.0	6.0	4.9	7.0
CWL-D3-170	ND	2.5	9.9	4.5	6.6	7.9
CWL-D3-350	ND	1.6	2.4	2.2	1.5	8.8
CWL-D3-440	ND	1.8	0.26	0.75	3.4	6.8
CWL-D3-480	ND	1.9	1.2	0.2	2.1	0.21

Notes:
[a]Analytical Method EPA 1999, "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-14A" Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.
[b]Port depth is in feet below ground surface.
[c]Duplicate sample result
ND = not detected
EPA = U.S. Environmental Protection Agency
ppmv = parts per million by volume
TCE = trichloroethene

Table 5-5
Historic Soil-Gas Monitoring Summary – Total Volatile Organic Compound Concentrations[a] (ppmv)
EPA Method TO-14A[b]
Chemical Waste Landfill

Well ID & Sample Port Depth[c]	June 1998	June 1999	August 2001	June 2004	September 2004	January 2012
CWL-UI1-40	112	246	141	11.78	11.47	11.76
CWL-UI1-80	0.22	9.63	13	10.61	10.67	10.18
CWL-UI1-120	6.32	9.94	45.42	9.36	21.41	11.07
CWL-UI2-36	17.6	2117	1800	813.7	850.0	4.64
CWL-UI2-80	0.126	1.65	4.37	5.52	6.90	7.85
CWL-UI2-136	10.5	4.21	7.98	4.42	2.85	11.45
CWL-D1-100	0.248	4.93	11.9	14.59	18.22	13.84
CWL-D1-160	167	21.4	30.1	33.32	38.41	18.48
CWL-D1-240	261	78.4	61.5	45.27	44.74	22.46
CWL-D1-350	0.02	20.7	31.7	18.73	30.53	16.56
CWL-D1-470	0.105	0.231	0.921	0.612	0.82	0.868
CWL-D2-120	5.4	33.0	29.4	29.26	34.23	20.70
CWL-D2-240	0.047	101	52.9	34.72	17.62	22.90
CWL-D2-350	0.091	22.9	25.9	15.42	23.41	13.31
CWL-D2-440	0.453	4.38	11.8	3.85	9.29	2.60
CWL-D2-470	0.058	6.95	8.40	4.17	6.60	5.784
CWL-D3-120	0.009	2.17	6.20	8.39	7.10	9.19
CWL-D3-170	0.037	5.01	15.0	6.11	9.40	10.57
CWL-D3-350	0.106	2.76	3.98	3.39	2.34	12.90
CWL-D3-440	0.017	4.04	0.519	0.96	5.14	9.69
CWL-D3-480	0.001	4.47	1.85	0.31	3.30	0.2986

Notes:
[a]The total VOC concentration is the sum of all constituents in the EPA Compendium.
[b]Analytical Method EPA 1999, "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-14A" Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.
[c]Port depth is in feet below ground surface.
EPA = U.S. Environmental Protection Agency
ppmv = parts per million by volume
VOC = volatile organic compound

Consistent with pre-VE VCM characterization data, the highest concentrations of TCE in soil gas remain in the central part of the vadose zone, approximately 240 feet bgs (CWL-D1 and CWL-D2 results for the 240 foot bgs depth, 22.0 and 18.0 ppmv respectively). Consistent with the detailed conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004), concentrations in this central portion of the plume are generally decreasing over time as VOC soil gas slowly diffuses in three dimensions (i.e., away from this central "core" of the VOC soil-gas plume). As this slow diffusion occurs, concentrations at other depths will sometimes increase. When the September 2004 results are compared to the January 2012 results for the CWL-D1 through CWL-D3 sampling ports (5 sampling ports each, for a total of 15 ports from 100 to 480 feet bgs), nine sampling ports show decreasing levels, whereas six ports show increasing levels. Only one of the three deep sampling ports (CWL-D1-470) had a higher concentration in January 2012 relative to September 2004. These trends are directly mimicked by the total VOC results.

Figures 5-1 through 5-5 show the concentration of TCE over time by sampling port for CWL-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3, respectively. Figures 5-6 through 5-10 show the concentration of total VOCs over time by sampling port for CWL-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3, respectively. These figures are graphical representations of the data presented in Tables 5-4 and 5-5. The total VOC plots for CWL-UI1 and CWL-UI2 (Figures 5-6 and 5-7) look very different than the corresponding TCE plots (Figures 5-1 and 5-2). This is because for these locations and the shallower depths represented (36 to 136 feet bgs), acetone used to occur at very high concentrations, especially in the shallowest two ports (36 and 40 feet bgs) (SNL/NM December 2004). Concentrations of total VOCs have decreased dramatically over time in these shallow ports, most likely reflecting diffusion to the surface. Concentrations of TCE in these shallower soil-gas wells has stayed relatively low or slightly increased, as reflected in Table 5-4 and Figures 5-1 and 5-2. These trends at CWL-UI1 and CWL-UI2 are also consistent with upward diffusion of TCE soil gas from the former plume "core" located approximately 250 feet bgs.

The majority of the CWL residual soil-gas plume is represented by the CWL-D1 through D3 wells that have significantly deeper sampling ports, ranging from 110 to 480 feet bgs. TCE is the dominant and primary VOC of concern. Concentrations are generally steady or decreasing over time (Figures 5-3 and 5-4), except at the CWL-D3 location (Figure 5-5). All sampling ports at CWL-D3 show an increasing trend except the deepest port at 480 feet bgs. Of interest is the fact that TCE in groundwater is currently only being detected in CWL-MW10, which is the closest groundwater monitoring well to CWL-D3 (see Figure 2-4). Because of the concern that VOC soil gas could potentially enter a groundwater well through the upper unsaturated portion of the well screen or at casing joints that may not be air tight and contaminate groundwater samples, passive soil-gas venting devices (i.e., Baroballs™) were installed on all groundwater monitoring wells in March 2012.

Overall, the CY 2012 data set is consistent with historic post-VE VCM soil-gas monitoring results and suggests the residual VOC soil-gas plume beneath the CWL is slowly dissipating in three dimensions through diffusion in the vadose zone. These data and conclusions are consistent with the conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004).

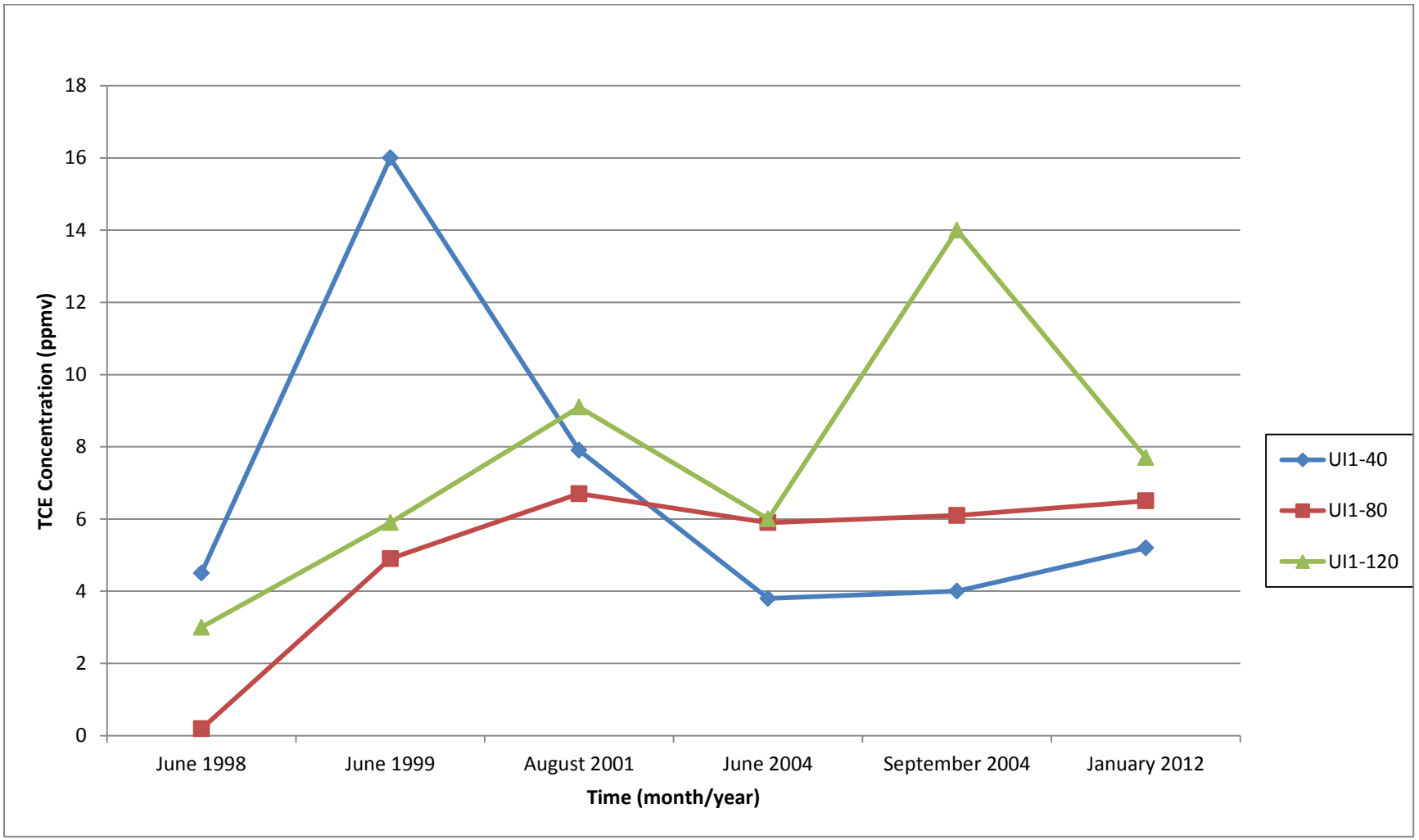

Figure 5-1
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-1 Ports

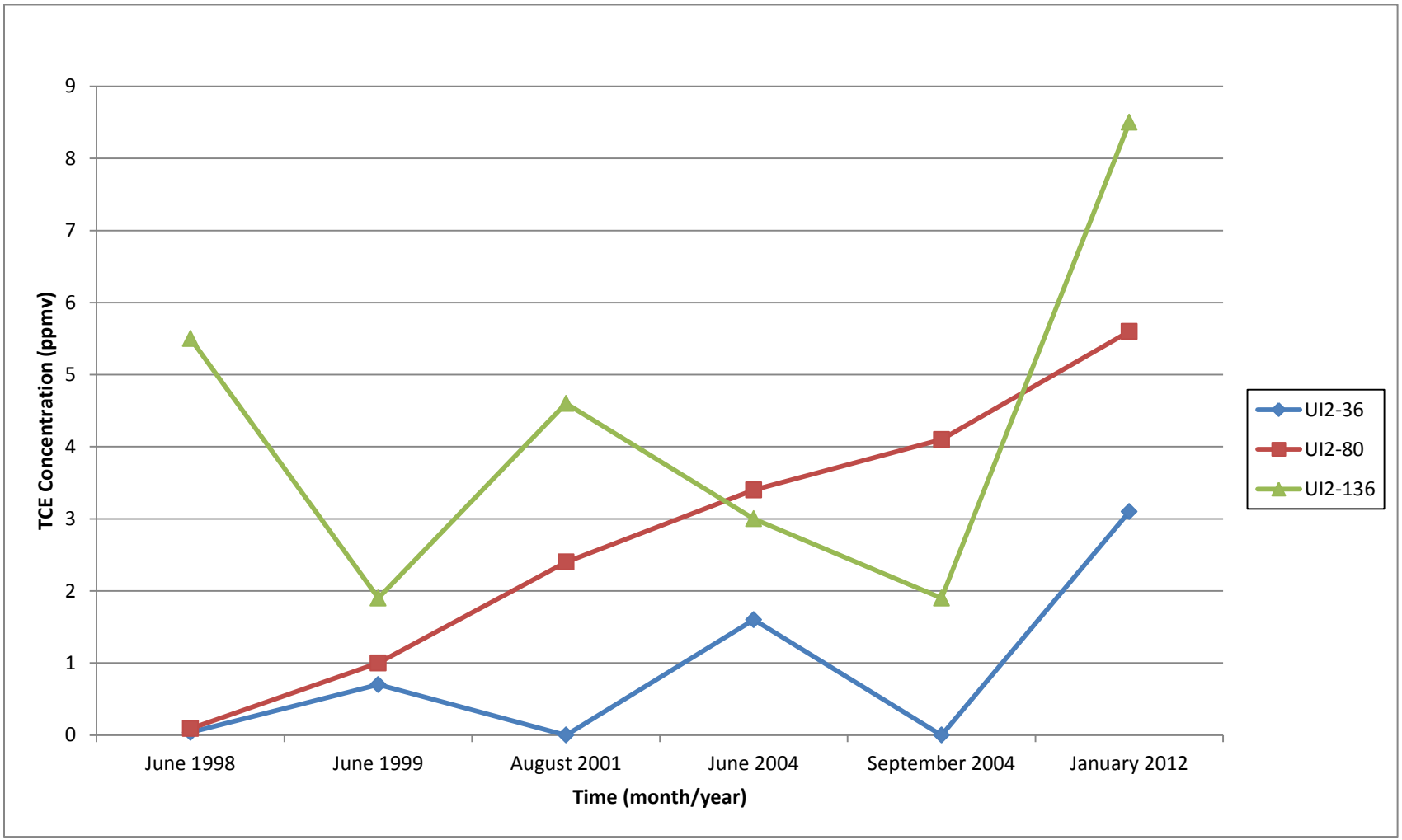

Figure 5-2
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-2 Ports

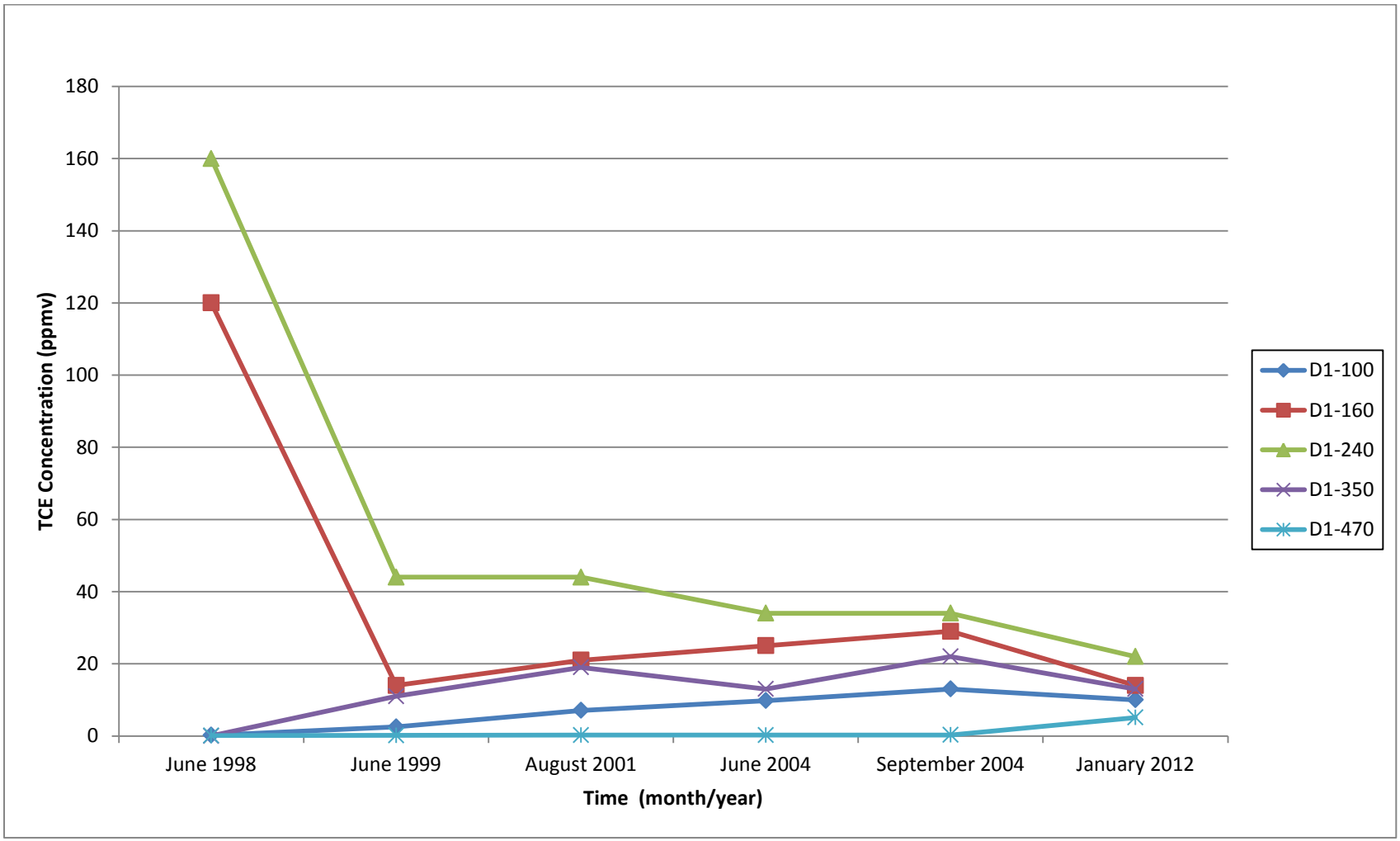

Figure 5-3
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well D1 Ports

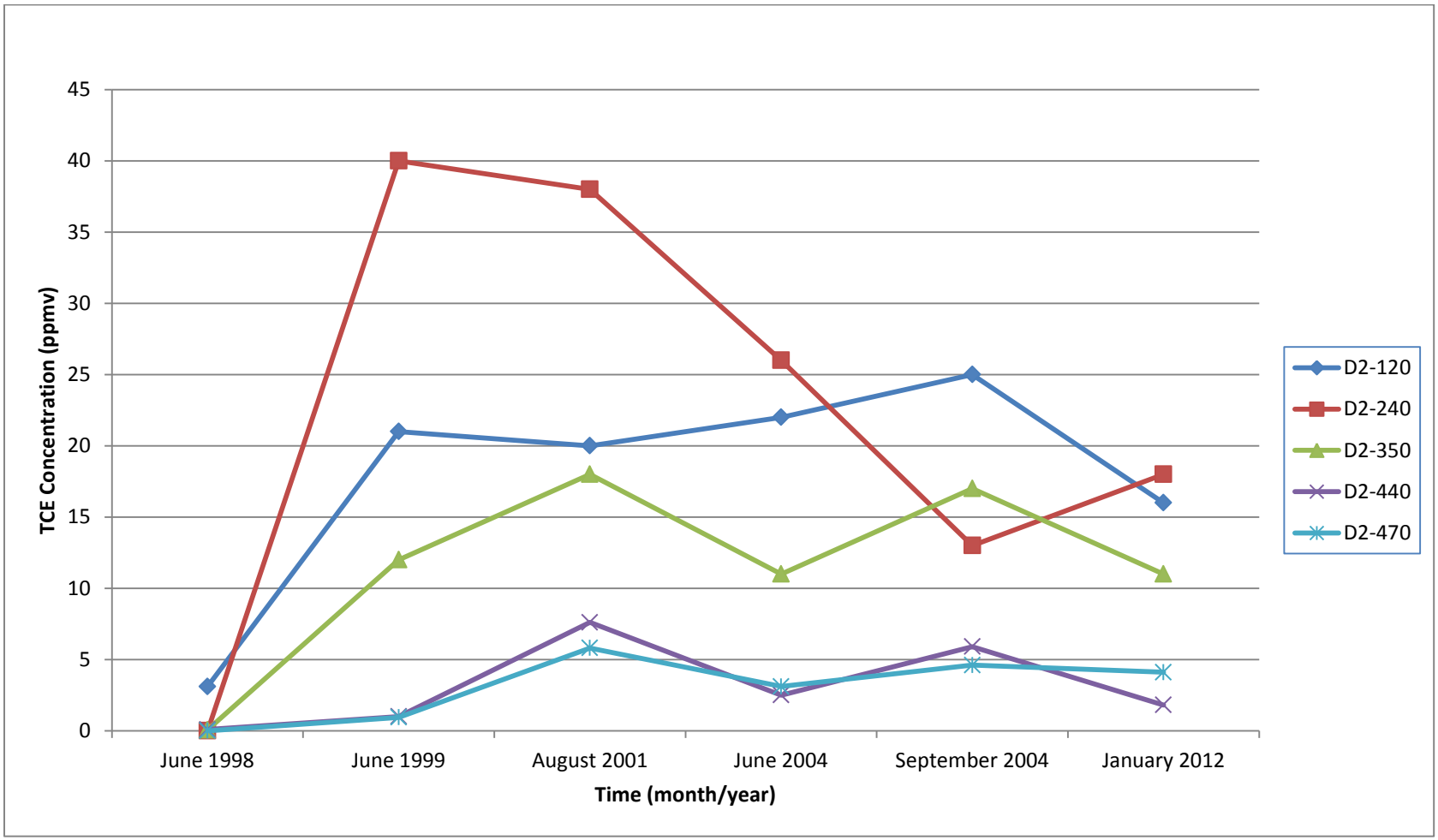

Figure 5-4
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well D2 Ports

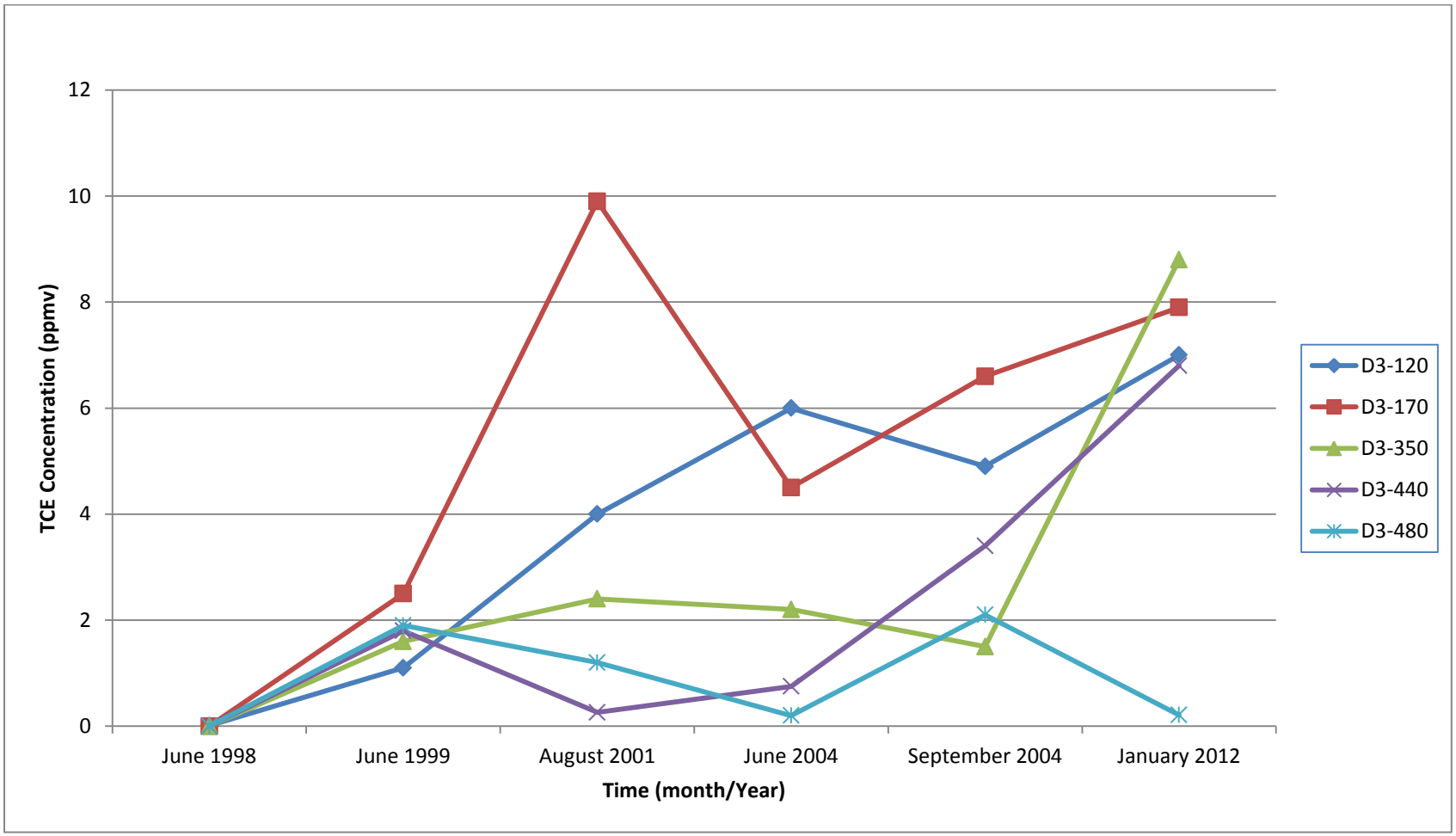

Figure 5-5
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well D3 Ports

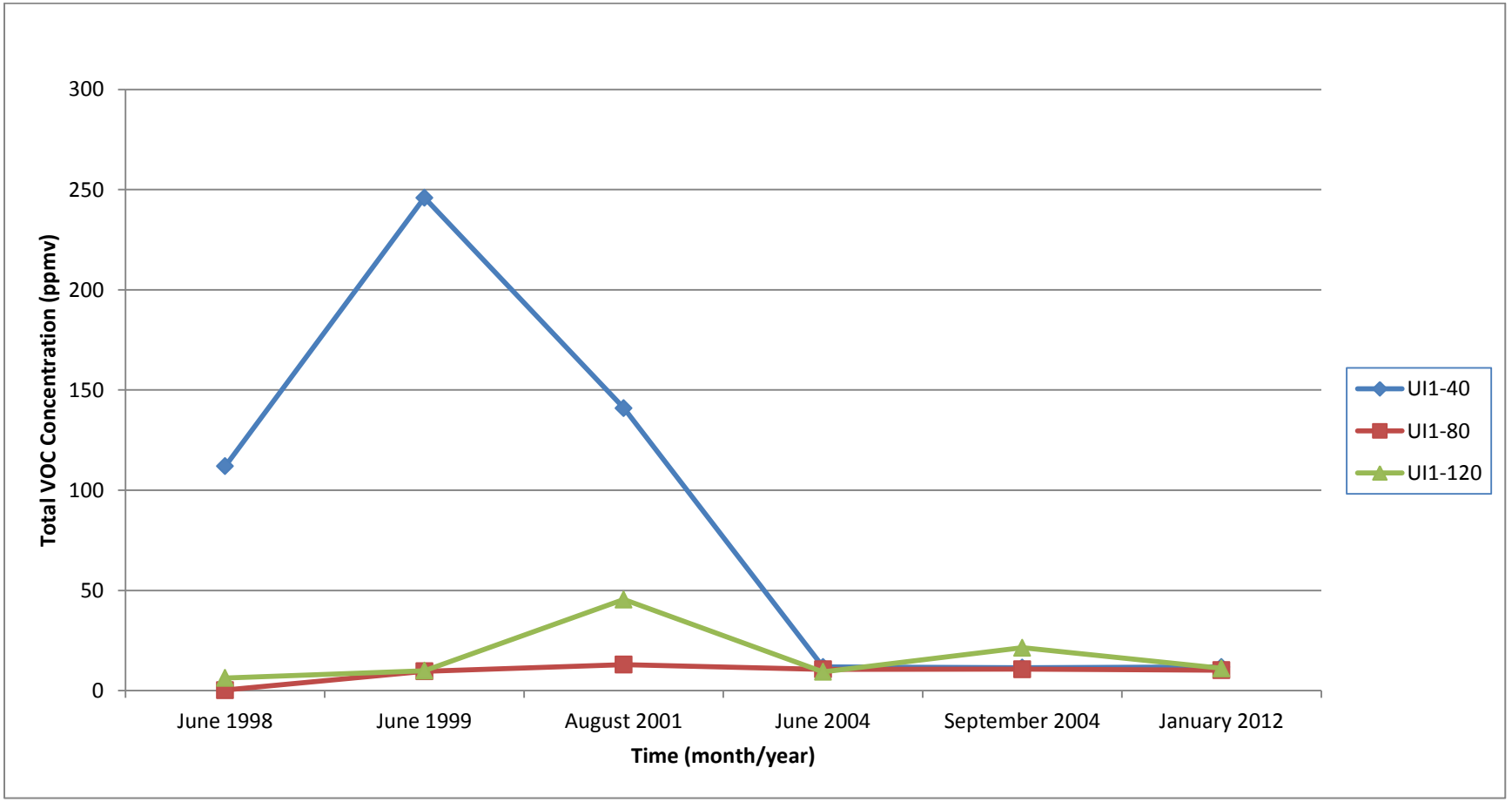

Figure 5-6
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-1 Ports

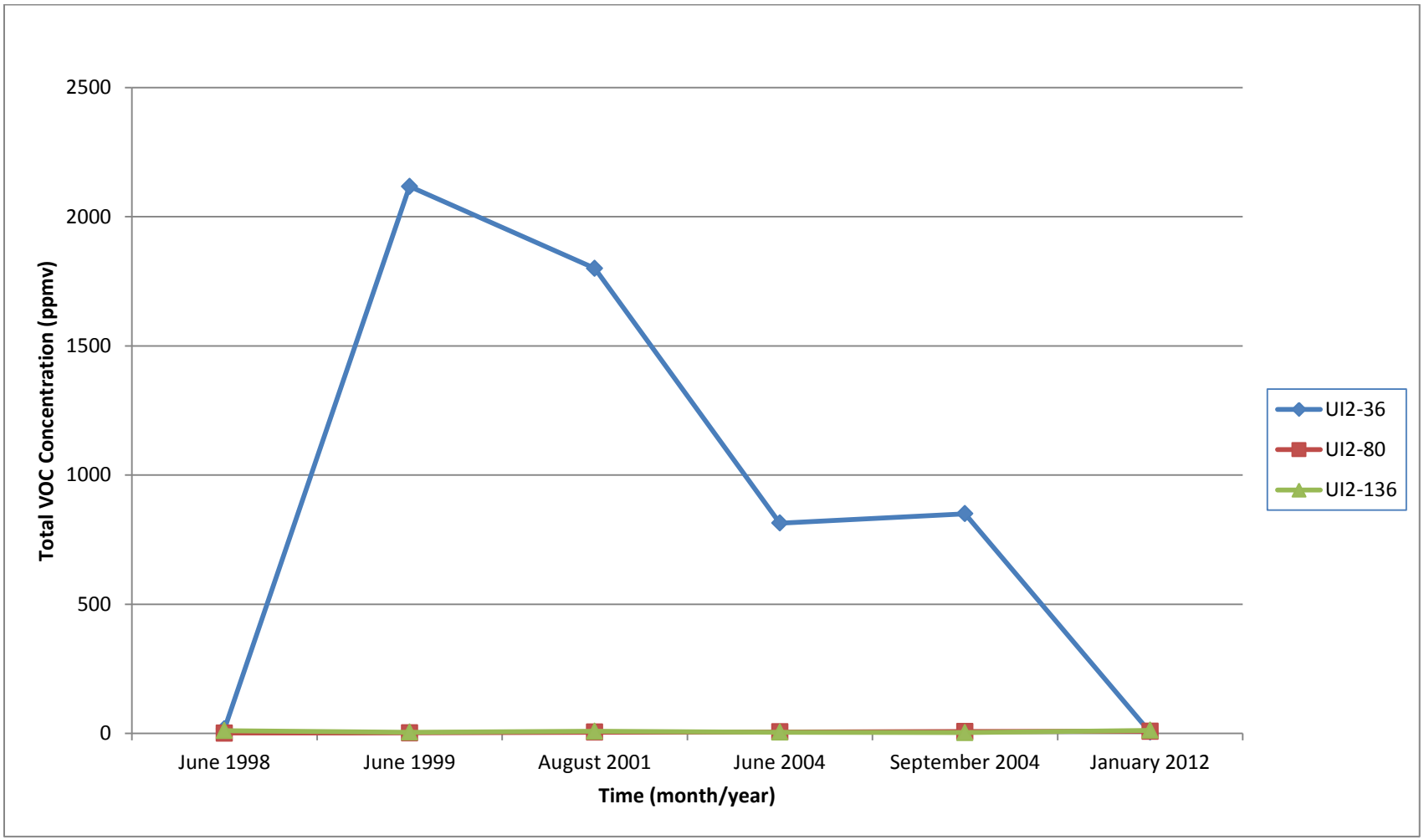

Figure 5-7
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-2 Ports

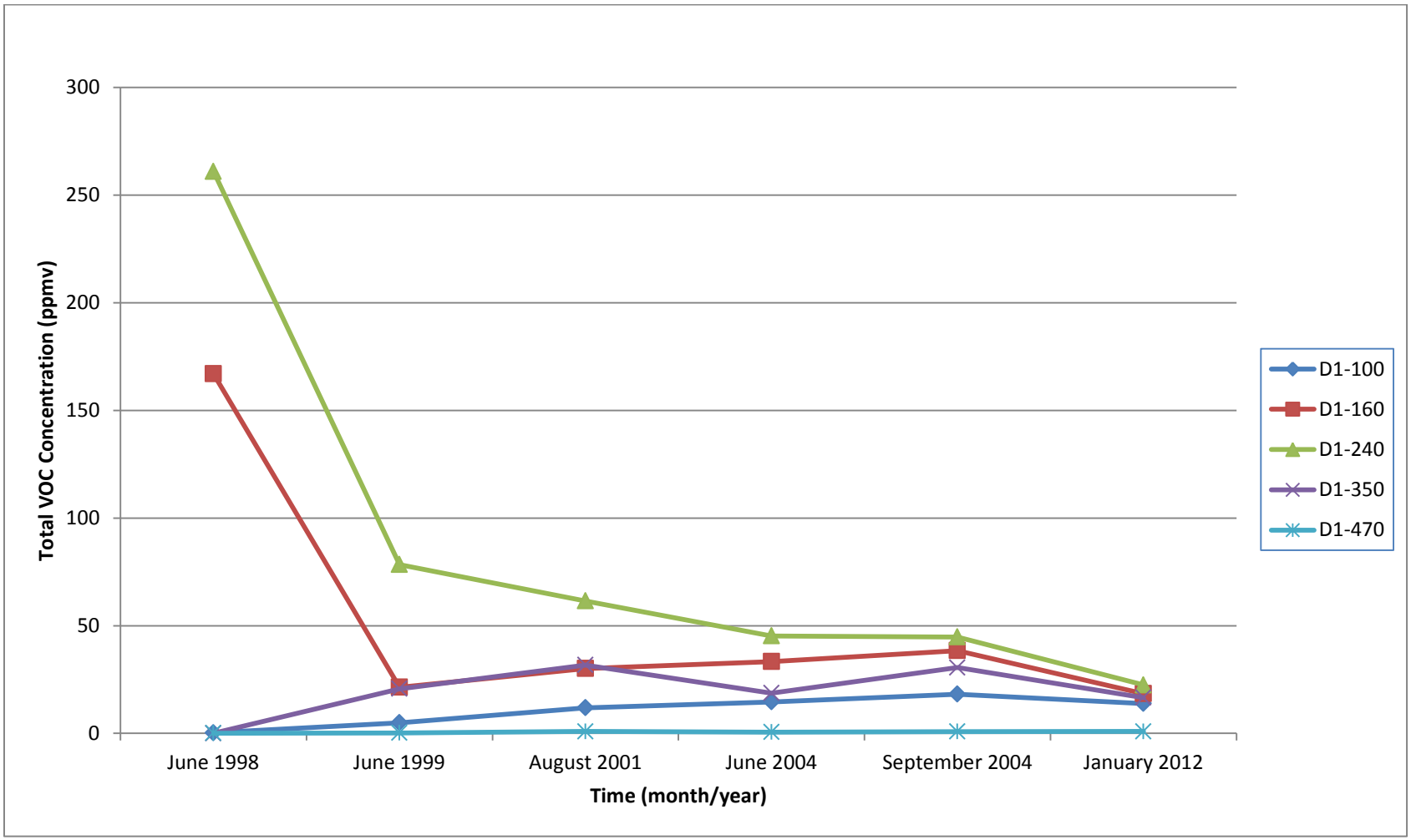

Figure 5-8
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well D1 Ports

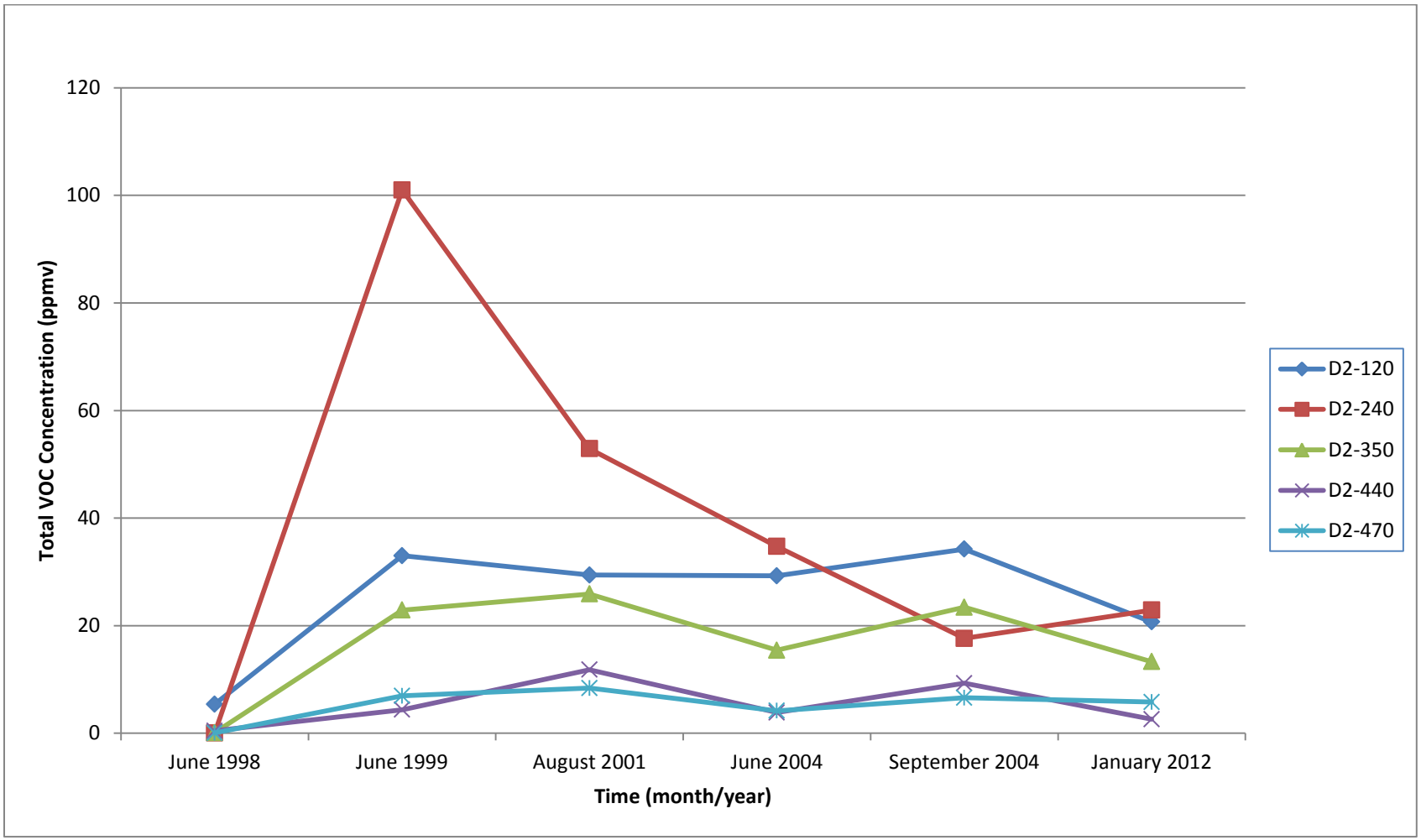

Figure 5-9
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well D2 Ports

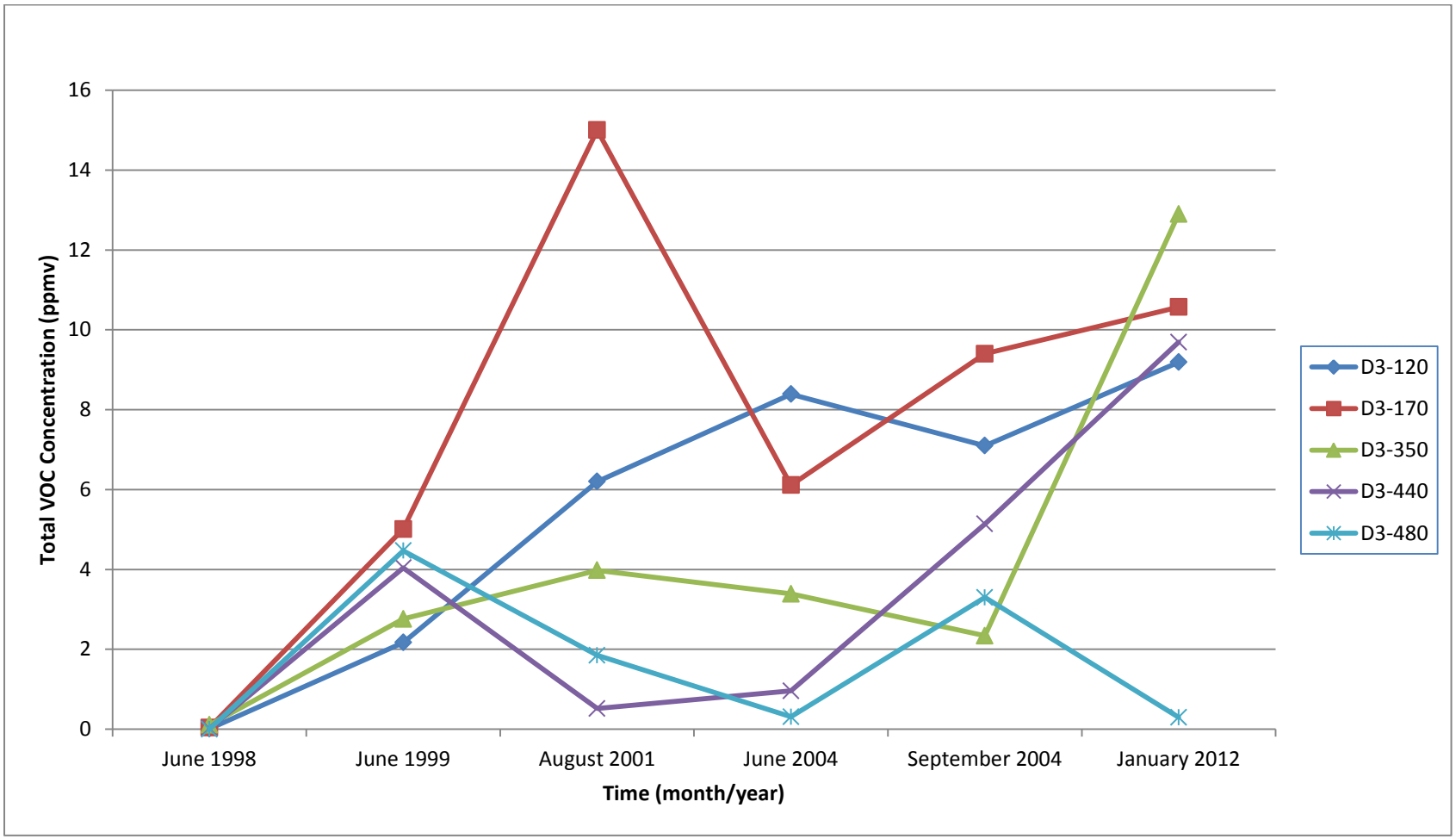

Figure 5-10
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well D3 Ports

6.0 INSPECTION, MAINTENANCE, AND REPAIR RESULTS

This chapter presents as summary of CY 2012 inspection, maintenance, and repair activities. Requirements for inspection, maintenance, and repair are presented in Section 3.2 of this report. The CWL post-closure care systems and features that require periodic inspection, maintenance, and/or repair include:

- Final Cover System (vegetation and cover)
- Surface-water diversion structures
- Compliance monitoring system (groundwater and soil-gas monitoring networks and sampling equipment)
- Perimeter security fence (including signs, gates, locks, and survey monuments)

A schedule for implementing inspections and prescribed maintenance is provided in CWL PCCP Attachment 1, Section 1.10, Table 1-6. CY 2012 inspections are summarized in the following sections and results are documented on the CWL Post-Closure Inspection Forms/Checklists provided in Annex C of this report, in conformance with the requirements in CWL PCCP Attachment 1, Section 1.9 and 1.10 (NMED October 2009 and subsequent revisions).

6.1 Final Cover System

The Final Cover System includes the ET Cover vegetation and the cover surface. ET Cover vegetation is inspected by the staff biologist and documented on the Biology Inspection Form/Checklist for the CWL Cover. The ET Cover surface is inspected by a field technician along with the storm-water diversion structures and security fence, and documented on the Post-Closure Inspection Form/Inspection Checklist.

6.1.1 Vegetation Monitoring and Inspection

Based upon results from ET Cover vegetation inspection conducted in CY 2011, it was determined that the three criteria for successful revegetation had been met (CWL PCCP Attachment 1, Section 1.9). This determination transitioned the frequency of cover vegetation monitoring to an annual basis.

The annual Biology Inspection of the ET Cover vegetation was conducted on September 18, 2012 by the SNL/NM staff biologist. The inspection was conducted at the end of the New Mexico growing season so an accurate determination of living plants at the site could be performed. Although 2011 through 2012 meteorological conditions (i.e., lack of significant rainfall events that fully saturate the soil) caused significant vegetation stresses, the ET Cover foliar coverage and vegetation continue to meet PCCP requirements for successful revegetation.

No mammal burrows were noted during the annual biology inspection, but ant hills/burrows were observed. Four-wing saltbush (*Atriplex canescens*) seedlings were observed during the September inspection, along with other undesirable annual "weedy" species, but their combined percentage of the total foliar coverage was very small (less than 5 percent).

The 2012 Chemical Waste Landfill Biology Report (Biology Report) is presented in Annex D of this report. It provides background information on ET Cover revegetation efforts, a summary of 2012 cover maintenance activities and local climate trends, additional details on the September Biology Inspection, ET Cover photographs, and recommendations. Cover maintenance was performed in September and involved the removal of snakeweed, Russian thistle, and other annual weedy species. Removal of four-wing saltbush (potentially deep-rooted shrub) will be performed in early CY 2013 to achieve the greatest plant mortality rate. Weeding/ET Cover maintenance events are currently not being performed because they are required by the PCCP; instead they are being performed at the direction of the staff biologist to promote the overall long-term health of the desired native grasses.

The following recommendations are included in the Biology Report:

- Removal of four-wing saltbush and undesirable annual weedy species will continue to occur as a voluntary, best management practice. Removal of the four-wing saltbush will be performed during the winter months to ensure the most effective results, as directed by the staff biologist.

6.1.2 Cover Inspection

Quarterly cover surface inspections were performed by a field technician in March, June, September, and December of 2012. No inspection parameters required repairs.

6.2 Storm-Water Diversion Structure Inspection

Quarterly inspections of storm-water diversion structures by a field technician were performed in March, June, September, and December of 2012. During the June inspection, tumbleweeds were noted blocking drainage channels on the southeast, southwest, and northwest corners of the site. The required repairs were made and verified on August 13, within 60 days of the June 20 inspection date.

6.3 Monitoring Well Network Inspection

Semi-annual inspection of the groundwater monitoring network and sampling equipment was performed by a field technician in January and July of 2012. In January the annual inspection for the soil-gas monitoring wells and sampling equipment was also performed. No inspection parameters required repairs but 2-inch well plugs on soil-gas monitoring wells CWL-UI-2 and CWL-D3 were replaced with 2-inch Baroballs™ (i.e., passive venting devices) in January 2012. Baroball™ assemblies were installed on all groundwater monitoring wells in March 2012 after notification to NMED on March 5 (see Section 7.2).

6.4 Security Fence Inspection

Quarterly inspections of the security fence, access controls (gates, locks, signs), and survey monuments were performed by a field technician in March, June, September, and December of 2012. No repairs were needed.

6.5 Emergency Equipment Inspection

For the CWL, inspection of emergency equipment listed in CWL PCCP Attachment 6, Table 6-4, is required on a quarterly frequency. This equipment is inspected weekly and documented on the CAMU 90-Day Area inspection forms. Any repairs or replacement of equipment are performed, as necessary, to maintain compliance with requirements for emergency equipment.

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7.0 REGULATORY ACTIVITIES

On June 2, 2011, the NMED approved closure of the CWL and the PCCP became the governing regulatory document for the CWL (Kieling June 2011). Regulatory activities in CY 2012 consisted of NMED approval of the November 2011 PCCP modification request (Kieling February 2012), a telephone conference with NMED to request direction and provide notification on PCCP-related issues, and completion of CWL well decommissioning work approved by NMED in December 2011. These activities are summarized below in Sections 7.1 through 7.3, respectively.

7.1 Permit Modification Request Approvals

Class 1 modifications that affected PCCP Attachment 6 (Contingency Plan) of the CWL PCCP were submitted to NMED on November 17, 2011, and took effect on November 16, 2011. The notifications were comprised of the following updates and revisions:

- Updating the list of figures in the permit, and
- Correcting a typographical error in the telephone number for an emergency coordinator.

The November 17, 2011 Class 1 modification request also addressed several operational changes at the CWL that affect Attachments 1 through 5 of the CWL PCCP (NMED October 2009) as summarized below.

- Attachment 1 Post-Closure Care Plan for the CWL: Allowing use of equivalent soil-gas passive venting devices; allowing use of an alternate method for analysis of soil-gas samples; clarifying the cover inspection and repair specifications; and updating three figures.
- Attachment 2 Groundwater Sampling and Analysis Plan: revising groundwater purging and stability requirements; and adding well completions diagrams for the four groundwater monitoring wells installed after the PCCP was issued.
- Attachment 3 Soil-Gas Sampling and Analysis Plan: updating the list of operating procedures; clarifying soil-gas purging requirements; and allowing use of an alternate method for analysis of soil-gas samples.
- Attachment 4 Inspection Forms: reformatting the forms; clarifying items to be inspected; and revising the inspection criteria for consistency with other parts of the PCCP.
- Attachment 5 Personnel Training Program: correcting a typographical error.

This Class 1 modification request was approved by NMED on February 20, 2012; the changes became effective immediately upon approval. Changes relative to groundwater monitoring and soil-gas monitoring were implemented during the July groundwater monitoring event and the March and May soil-gas sampling events.

7.2 March 5, 2012 Phone Conference with NMED

DOE and Sandia requested a telephone conference with NMED to request direction regarding a rehabilitation plan for sampling port CWL-D3-440. A sample could not be obtained from this soil-gas sampling port in January, most likely due to an obstruction blocking the sampling port screen. The SNL/NM groundwater sampling team leader proposed using pressurized ultra-pure grade nitrogen to attempt to re-open the sampling port screen. After discussion, NMED staff agreed to the rehabilitation plan and directed DOE and Sandia to collect the environmental sample approximately one week later to allow time for any injected nitrogen to dissipate in the subsurface.

Based upon the TCE detection in the preliminary results from the January groundwater sample from CWL-MW10 (4.68 µg/L), DOE and Sandia notified NMED that they intended to install passive venting devices (i.e., Baroball™ devices) on all groundwater monitoring wells in accordance with PCCP Attachment 1, Section 1.4.2. The devices were installed on all groundwater monitoring wells on March 9, 2012.

Additional discussion included ongoing monitoring and inspection activities, delivery of the CY 2011 CWL Annual Report by the end of March 2012, and the recent NMED approval (Kieling February 2012) of the CWL PCCP modification request (Wagner November 2011).

7.3 Monitoring Well Decommissioning

A monitoring well plugging and abandonment (P&A) plan for seven groundwater monitoring wells and one soil-gas monitoring well located at the CWL was submitted to the NMED on October 18, 2011 (SNL/NM October 2011). The wells are no longer needed as they are obsolete, dry, or otherwise not suited for compliance monitoring. The P&A plan was approved by NMED on December 12, 2011 (Kieling December 2011) and included the rationale, methods, and procedures for decommissioning the wells. The eight CWL monitoring wells (CWL-BW3, CWL-MW1A, CWL-MW2BL, CWL-MW2BU, CWL-MW3A, CWL-MW7, CWL-MW8 and CWL-UI3) were decommissioned in November 2012. A report on the decommissioning work will be submitted to the New Mexico Office of the State Engineer and NMED in 2013.

8.0 SUMMARY AND CONCLUSIONS

A summary of CY 2012 activities and results is provided in this Chapter, along with conclusions.

8.1 Groundwater and Soil-Gas Monitoring

Two semi-annual groundwater monitoring events were conducted in January and July 2012. Groundwater samples were collected and analyzed in accordance with PCCP Attachment 1, Section 1.8 and Attachment 2 requirements. There were no variances, non-conformances, or project-specific issues related to the sampling activities. No results were above respective concentration limits.

Statistical assessment was conducted on the results from replacement well CWL-BW5 and former well CWL-BW4A. There was no statistically significant evidence of increasing contamination and no hazardous constituent 95% LCLs exceeded their respective concentration limits. Groundwater surface elevation, hydraulic gradient, flow direction, and groundwater flow rate have been determined and are consistent with historical results.

In January 2012 the first soil-gas monitoring event was conducted under the CWL PCCP. Samples collected from all wells were analyzed for VOCs by analytical method EPA TO-14. Additional soil-gas sampling was required in March (to sample CWL-D3-440 sampling port that was reopened using pressurized ultra-pure grade nitrogen) and May (duplicate pair resampling due to January sample pairs not meeting the RPD acceptance criterion for specific constituents). TCE was detected in all samples at concentrations ranging from 0.061 ppmv to 22.00 ppmv. No results and no LCLs exceeded the trigger level of 20 ppmv. Results were consistent with historic monitoring results and suggest the residual VOC soil-gas plume beneath the CWL is slowly dissipating in three dimensions through diffusion in the vadose zone. These data and conclusions are consistent with the conceptual site model presented in Annex E of the CWL Corrective Measures Study Report (SNL/NM December 2004).

8.2 Inspections

Inspections of the CWL final cover system, storm-water diversion structures, compliance monitoring system, and security fence were performed in accordance with CWL PCCP requirements. One repair associated with clearing debris (wind-blown tumbleweeds) from storm water drainage channels was completed within the required 60-day time frame.

Based upon the September biology inspection, the ET Cover continues to meet successful revegetation criteria. Removal of four-wing saltbush and undesirable annual weedy species will continue to occur as a voluntary, best management practice as directed by the staff biologist.

8.3 Regulatory Activities

Regulatory activities in CY 2012 included NMED approval of the November 2011 Class 1 Permit modification request, a telephone conference with NMED to request direction and provide notification on PCCP-related issues, and completion of decommissioning activities (8 monitoring wells).

8.4 Conclusions

All PCCP monitoring and inspection requirements have been performed and documented for CY 2012, which represents the first full year of PCCP implementation (Permit became effective on June 2, 2011 mid-way through the calendar year). This CWL Annual Post-Closure Care Report presents monitoring and inspection activities and results as required by the PCCP Attachment 1, Section 1.12.

9.0 REFERENCES

EPA, see U.S. Environmental Protection Agency.

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ANNEX A
Chemical Waste Landfill
CY 2012 Groundwater Monitoring Forms and Reports

Field Forms

Data Validation Reports

Contract Verification Reports

FIELD SAMPLING FORMS

CWL POST-CLOSURE CARE GROUNDWATER MONITORING

Form Title	Corresponding Procedure
Tailgate Safety Briefing	PLA 05-09
Groundwater Sample Collection Field Equipment Check Log	FOP 05-02
Portable Pump and Tubing/Water Level Indicator Decontamination Log Form	FOP 05-03
Field Measurement Log For Groundwater Sample Collection	FOP 05-01
Analysis Request and Chain of Custody*	LOP 94-03

*Completed AR/COC forms are provided in the Data Validation Section of this Annex.

FIELD SAMPLING FORMS

JANUARY 2012 GROUNDWATER MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: LWL-MW10 Date: 1-23-12 Time: 0804

Activities: Groundwater Monitoring / Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill _____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.		☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.		☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.		☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.		☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.		☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Gilbert L. Quintana	
ALFRED SANTILLANES	
Robert Lynch	
William Gibson	

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW10 Date: 1-20-12 Time: 0757

Activities: Groundwater Monitoring / Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.		☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.		☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.		☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.		☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.		☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Gilbert L. Quintana	Gilbert L Quintana
ALFRED SANTILLANES	Alfred Santillanes
Robert Lynch	Robert Lynch
William Gibson	William J Gibson

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW11 Date: 01-19-12 Time: 0756

Activities: Groundwater Monitoring / Sampling

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.		☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.		☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.		☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.		☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.		☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Gilbert L. Quintana	Gilbert L Quintana
ALFRED SANTILLANES	Alfred Santillanes
Robert Lynch	Robert Lynch
William Gibson	William Gibson

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-BW5 Date: 1-18-12 Time: 0755

Activities: Groundwater Monitoring / Sampling
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.		☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.		☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.		☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.		☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.		☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
ALFRED SANTILLANES	Alfred Santillanes
Robert Lynch	Robert Lynch
William Gibson	William J Gibson

Printed Name / Signature

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW9 Date: 1-17-12 Time: 0754

Activities: Groundwater Monitoring / Sampling

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill _____ °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules
Other: _____

Safety Topics Presented

☐ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☐ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☐ Wear safety boots.		☐ Be aware of electrical hazards
☐ Use safe lifting practices. Wear leather gloves if necessary.		☐ Be aware of pressure hazards.
☐ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☐ No eating or drinking at sampling counter.
☐ Be aware of chemical hazards.		☐ Be aware of biohazards (snakes, spiders, etc.)
☐ Wear nitrile or latex gloves when sampling.		☐ Wear communication device (cell phone, EOC pager).
☐ Wear chemical safety goggles.		☐ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
ALFRED SANTILLANES	
Robert Lynch	
William Gibson	

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL GWM	Project No.: 146422.10.11.01
Well I.D.: CWL-BW5	Date: 1/18/12
Well Condition: ———	Weather Condition: 24.67" Hg, 24°F
Method: Portable pump X	Dedicated pump ——— Pump depth: 521

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO (mg/L)
509.50	0806	—	—	START		—	—	—	
513.11	0830	5	16.92	1212	407.7	6.65	0.96	74.0	7.14
514.10	0842	10	17.81	1219	406.8	6.68	0.97	69.5	6.67
514.74	0854	15	17.69	1218	409.5	6.65	1.23	67.4	6.38
515.19	0906	20	17.86	1218	410.5	6.65	0.91	66.5	6.19
515.39	0913	23	17.83	1218	411.4	6.64	0.94	71.1	6.73
515.52	0919	25	17.89	1216	411.7	6.64	0.79	71.3	6.74
515.63	0923	27	17.91	1219	411.9	6.64	0.87	71.1	6.70
515.77	0929	29	17.94	1218	412.0	6.64	0.90	70.9	6.66
515.89	0934	31	17.96	1218	412.0	6.65	0.86	70.3	6.56
515.94	0937	32	17.95	1217	411.9	6.65	0.87	70.4	6.56
	0938	—	Sampling			—	—	—	
									24-gal purged from tubing
									0818

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL GWM	Project No.: 146422.10.11.01
Well I.D.: CWL-MW9	Date: 1-17-12
Well Condition: ———	Weather Condition: 24.66"Hg, 32°F
Method: Portable pump X	Dedicated pump ——— Pump depth: 516'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO (mg/L)
501.93	0804	———	START	———					
502.28	0840	5	16.07	1000	388.7	6.81	2.39	21.7	2.12
506.05	0858	10	16.52	1024	325.9	6.79	1.15	17.6	1.70
506.28	0917	15	17.17	1046	307.9	6.75	0.79	14.9	1.43
506.11	0940	20	17.55	1060	298.7	6.74	0.68	14.7	1.40
506.36	1001	25	18.33	1069	297.9	6.73	0.64	15.6	1.47
506.58	1020	30	18.48	1070	307.0	6.72	0.48	16.7	1.56
506.76	1028	32	18.64	1075	306.5	6.72	0.54	16.7	1.55
506.89	1035	34	18.40	1077	308.1	6.73	0.50	17.8	1.67
506.92	1043	36	18.50	1076	308.3	6.73	0.52	18.3	1.77
506.77	1047	37	18.47	1075	308.6	6.73	0.56	18.0	1.68
	1048	———		Sampling	———				
									24-gal purged
									psiv 4 J measurement
									0820

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL GWM	Project No.: 146422.10.11.01
Well I.D.: CWL-MW10	Date: 1-20-12 / 1-23-12
Well Condition: —	Weather Condition: 24.4 "Hg, ~35 °F
Method: Portable pump X	Dedicated pump ____ Pump depth: 515'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO (mg/L)
498.69	0809	—	—	Stat	—	—	—	—	—
503.30	0900	5	17.60	955	359.3	6.91	0.71	36.5	3.48
507.04	0936	10	17.43	959	353.7	6.88	0.92	32.4	3.09
510.64	1011	15	17.02	966	358.9	6.86	2.36	27.5	2.65
512.15	1024	17	16.96	968	355.1	6.85	2.68	26.7	2.57
513.87	1045	19	16.81	969	347.3	6.86	3.37	26.6	2.57
514.70	1056	20	17.55	966	348.9	6.87	3.59	27.8	2.66
515.00	1106	21	17.89	968	348.7	6.87	3.82	31.2	2.95
515.44	1110	21.25	18.15	969	345.5	6.89	3.41	30.4	2.87
515.44	1110	—	well DRY	—	—	—	—	—	—
498.68	0826	—	— start	—	—	—	—	—	1-23-12
500.23	0847	0.5	13.58	966	384.1	7.16	3.32	48.9	7.15
500.56	0851	1	14.22	967	383.9	7.14	3.21	46.0	4.64
	0852	—	— pump	lines	—	—	—	—	—
									~1.65 gal purged
									prior measurement
									0823
							1-23-12		→ 0844

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL GWM	Project No.: 146422.10.11.01
Well I.D.: CWL-MW11	Date: 1-19-12
Well Condition: ———	Weather Condition: 24.58"Hg 37°F
Method: Portable pump X	Dedicated pump ——— Pump depth: 513'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO (mg/L)
498.35	0811			Start					
501.46	0856	5	15.43	1115	404.0	6.49	0.96	55.5	5.62
504.70	0923	10	16.54	1116	384.9	6.57	0.42	55.5	5.39
507.00	0952	15	17.82	1110	371.7	6.61	0.98	53.1	5.01
509.20	1020	20	18.90	1080	358.5	6.67	0.82	40.1	3.71
510.45	1100	25	20.11	1102	377.8	6.71	0.64	36.6	3.31
510.50	1201	30	19.86	1109	361.3	6.72	0.27	51.1	4.65
510.76	1225	32	19.68	1100	375.4	6.75	0.36	50.3	4.55
510.98	1247	34	19.71	1102	369.0	6.77	0.46	49.5	4.43
511.16	1307	36	19.61	1100	374.2	6.76	0.46	50.0	4.49
	1308			Samples					
									~1.65 gal purged
									prior to measurement
									0827

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by:	Date: 1-17-12

Make & Model:

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 99J0064

YSI 650 MDS (S/N): 05H100440

pH Calibration

pH Calibrated to (std): 7,00 pH sloped to (std): 10,00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0638	4,01	18,8	7,00	18,8	10,01	18,8
2. Time: 1124	3,99	19,2	7,02	19,2	10,02	19,2
3. Time:						
4. Time:						

Standard lot no.: 054115

Expiration date: 12/12

SC Calibration

Reference Value: 1278 Standard Lot No.: 1710737

Expiration Date: 12/12

	Value	Temp
1. Time: 0641	1276	18,8
2. Time: 1126	1281	19,2
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 200,0 Standard Lot No. 03K0868

Expiration Date: 12/12

	Value	Temp
1. Time: 0640	199,7	18,8
2. Time: 1125	200,3	19,2
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0637	61,3	24.38
2. Time: 1123	61,2	24.39
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL GWM			Project No.: 146422.10.11.01	
Calibration done by: [illegible]			Date: 1-17-12	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 10050C002897	
Reference Value	X10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0803	9.34	20.0	97.2	796
2. Time 1051	9.41	20.1	96.6	794
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: RL	Date: 1-18-12

Make & Model:

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 99J0064

YSI 650 MDS (S/N): 05H100440

pH Calibration

pH Calibrated to (std): 7,00			pH sloped to (std): 10,00			
Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0633	3,98	18.5	7.00	18.5	9.99	18,5
2. Time: 1038	4.00	18.9	7.01	18.9	10.02	18.9
3. Time:						
4. Time:						
Standard lot no.: 054115						
Expiration date: 12/12						

SC Calibration

Reference Value: 1278			Standard Lot No.: 1710737
	Value	Temp	Expiration Date: 12/12
1. Time: 0635	1274	18,5	
2. Time: 1040	1277	18,9	
3. Time:			
4. Time:			

ORP Calibration

Reference Value: 200,0			Standard Lot No. 03K0868
	Value	Temp	Expiration Date: 12/12
1. Time: 0634	199,9	18,5	
2. Time: 1039	200,6	18,9	
3. Time:			
4. Time:			

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0632	81,6	24,44
2. Time: 1037	81,6	24,45
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CwL GWM			Project No.: 146422.10.11.01	
Calibration done by: TL			Date: 1-18-12	
TURBIDIMETER				
Make & Model: HACH 2100Q			Serial No. S/N 10050C002897	
Reference Value	X10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0757	9.59	20.1	101	797
2. Time 0957	9.66	20.2	102	799
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: RV	Date: 1-19-12

Make & Model:

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 99J00064

YSI 650 MDS (S/N): 05H100440

pH Calibration

pH Calibrated to (std): 7.00 | pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0700	3.99	18.8	7.01	18.8	10.00	18.8
2. Time: 1429	4.01	19.7	7.00	19.7	10.03	19.7
3. Time:						
4. Time:						

Standard lot no.: 054115

Expiration date: 12/12

SC Calibration

Reference Value: 1278 | Standard Lot No.: 1710737

Expiration Date: 12/12

	Value	Temp
1. Time: 0702	1280	18.8
2. Time: 1431	1282	19.7
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 200.0 | Standard Lot No. 03K0868

Expiration Date: 12/12

	Value	Temp
1. Time: 0701	201.0	18.8
2. Time: 1430	200.8	19.7
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0659	81.3	24.34
2. Time: 1428	81.6	24.26
3. Time:		
4. Time:		

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL GWM		Project No.: 146422.10.11.01		
Calibration done by: RL		Date: 1-19-12		
TURBIDIMETER				
Make & Model: HACH 2100Q		Serial No. S/N 10050C002897		
Reference Value	X10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0759	9.60	20.1	99.7	794
2. Time 1340	9.71	20.1	99.6	799
3. Time				
4. Time				

Comments:

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: RL	Date: 1-20-12 / 1-23-12 (#3, 4)

Make & Model:

YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 99J00064

YSI 650 MDS (S/N): 05H100440

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.00

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0641	4.01	19.7	7.00	19.7	9.99	19.7
2. Time: 1409	4.01	20.2	7.01	20.2	10.00	20.2
3. Time: 0706	4.02	19.6	7.00	19.6	10.00	19.6
4. Time: 1141	4.01	19.9	7.01	19.9	10.00	19.9
Standard lot no.: 054115						
Expiration date: 12/12						

SC Calibration

Reference Value: 1278 Standard Lot No.: 1710737

Expiration Date: 12/12

	Value	Temp
1. Time: 0643	1280	19.7
2. Time: 1411	1281	20.2
3. Time: 0708	1278	19.6
4. Time: 1143	1277	19.9

ORP Calibration

Reference Value: 200.0 Standard Lot No. 03K0868

Expiration Date: 12/12

	Value	Temp
1. Time: 0642	199.7	19.7
2. Time: 1410	200.1	20.2
3. Time: 0707	201.1	19.6
4. Time: 1142	200.8	19.9

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0640	81.0	24.21
2. Time: 1408	81.4	24.24
3. Time: 0705	81.1	24.26
4. Time: 1140	81.2	24.27

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: CWL GWM		Project No.: 146422.10.11.01		
Calibration done by: TL		Date: 1-20-12 / 1-23-12 (#3,4)		
TURBIDIMETER				
Make & Model: HACH 2100Q		Serial No. S/N 10050C002897		
Reference Value	X10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0802	9.46	20.0	100	7.94
2. Time 1420	9.58	20.1	99.8	796
3. Time 0817	9.61	20.2	101	801
4. Time 0911	9.56	20.1	100	803

Comments:

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: CWL GWM	**Monitoring Well ID # :** CWL-MW11	**Date:** 1-19-12

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: CWL System, 1506-640	**Water Level Indicator ID #:** 56161
Personnel Performing Decontamination: Alfred Santillanes — Print Name: — Initial: Robert Lynch — Print Name: — Initial:	**Personnel Performing Decontamination:** William Gibson — Print Name: — Initial: Print Name: — Initial:

Condition of Equipment

Pump: Good **Tubing Bundle:** Good **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	HNO_3
Source: Culligan	**Grade:** Reagent
Lot Number: 01-04-12	**UN #:** 2031
	Manufacturer: Fisher
	Lot Number: 002735

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: CWL GWM	**Monitoring Well ID # :** CWL-BW5	**Date:** 1-18-12

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: GWM System, 1606-546	**Water Level Indicator ID #:** 56161
Personnel Performing Decontamination: Alfred Santillanes — Print Name: — Initial: Robert Lynch — Print Name: — Initial:	**Personnel Performing Decontamination:** William Gibson — Print Name: — Initial: ____ — Print Name: — Initial:

Condition of Equipment

Pump: Good **Tubing Bundle:** Good **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 01-04-12	**UN #:** 2031
	Manufacturer: Fisher
	Lot Number: 002735

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: CWL GWM	**Monitoring Well ID # :** CWL-MW9	**Date:** 1-17-12

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: GWM System, 1806-586	**Water Level Indicator ID #:** 56161
Personnel Performing Decontamination: Alfred Santillanes — Print Name: — Initial: Robert Lynch — Print Name: — Initial:	**Personnel Performing Decontamination:** William Gibson — Print Name: — Initial: Print Name: — Initial:

Condition of Equipment

Pump: Good **Tubing Bundle:** Good **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	**HNO_3**
Source: Culligan	**Grade:** Reagent
Lot Number: 01-04-12	**UN #:** 2031
EB1: COC 613964 taken prior to CWL-BW5	**Manufacturer:** Fisher
	Lot Number: 002735

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: CWL GWM	**Monitoring Well ID #:** CWL-MW10	**Date:** 1-23-12

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: CWL System, 1806-640	**Water Level Indicator ID #:** 56161
Personnel Performing Decontamination: Alfred Santillanes — Print Name: — Initial: [signature] Robert Lynch — Print Name: — Initial: RL	**Personnel Performing Decontamination:** William Gibson — Print Name: — Initial: ____ Print Name: — Initial: ____

Condition of Equipment

Pump: Good **Tubing Bundle:** Good **Water Level Indicator:** Good

List of Decontamination Materials

Distilled or **Deonized** (circle one) **Source:** Culligan **Lot Number:** 01-04-12	**HNO_3** **Grade:** Reagent **UN #:** 2031 **Manufacturer:** Fisher **Lot Number:** 002735

SUMMARY SHEET FOR JANUARY 2012 SAMPLES

Sample Summary for CWL Groundwater Monitoring

2nd Quarter FY12

Sample ID	Sample Date	ARCOC	Sample Number	Sample Type	Associated Equipment Blank (ARCOC #/Sample #)	Associated Trip Blank (ARCOC # / Sample #)	Associated Field Blank (ARCOC # / Sample #)	Comments
CWL GWM: Environmental Samples 146422.10.11.01								
CWL-BW5	18-Jan-12	613965	091638	Environmental	613964 / 091636	613965 / 091640	n/a	
CWL-BW5	18-Jan-12	613965	091639	Duplicate	613964 / 091636	613965 / 091640	n/a	
CWL-MW9	17-Jan-12	613962	091632	Environmental	n/a	613962 / 091633	n/a	
CWL-MW10	23-Jan-12	613969	091647	Environmental	n/a	613969 / 091648	613969 / 091649	
CWL-MW11	19-Jan-12	613967	091643	Environmental	n/a	613967 / 091644	n/a	
CWL-EB1	17-Jan-12	613964	091636	Equipment Blank	n/a	613964 / 091637	n/a	Decon prior to CWL-BW5
CWL GWM: Waste Characterization Samples								
CWL-BW5	18-Jan-12	613966	091641	Waste	n/a	613966 / 091642	n/a	No data validation required
CWL-MW9	17-Jan-12	613963	091634	Waste	n/a	613963 / 091635	n/a	No data validation required
CWL-MW10	20-Jan-12	613970	091650	Waste	n/a	613970 / 091651	n/a	No data validation required
CWL-MW11	19-Jan-12	613968	091645	Waste	n/a	613968 / 091646	n/a	No data validation required

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

GROUNDWATER MONITORING

JANUARY 2012

AR/COC NUMBERS 613962, 613964, and 613965

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: March 7, 2012

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 613962, 613964, and 613965
SDG: 294334
Laboratory: GEL
Project/Task: 146422.10.11.01
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 3.

Summary

Seven samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. 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

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks except as follows.

In the EB, sample 294334-004, associated with samples -007 and -009, chloroform was detected at a concentration > the PQL. The associated sample results were NDs and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria. It should be noted that the MS/MSD analyses were performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

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

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

TBs, EB, and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result. It should be noted that the EB on AR/COC# 613964 is associated with the samples on AR/COC# 613965.

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 03/08/12

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: March 7, 2012

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 613962, 613964, and 613965
SDG: 294334
Laboratory: GEL
Project/Task: 146422.10.11.01
Analysis: Metals

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 3.

Summary

Four samples were prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS metals). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   The Ca concentrations for samples 294334-002, 008, and -010 were > the ICS A Ca concentration and the ICS A result for Ni was > the MDL. The associated sample results were detects <50X the ICS A results and will be **qualified "J+,CK2."**

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.

ICP-MS Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

ICP-MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria. It should be noted that the MS analyses were performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria. It should be noted that the replicate analyses were performed on a SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted.

ICP Interference Check Sample (ICS A and AB)

All ICS A and AB met QC acceptance criteria except as noted above in the summary section and as follows.

ICP-MS metals:
The Ca concentrations for samples -002, -008, and -010 were > the ICS A Ca concentration and the ICS A result for Cr was > the MDL. However, the associated sample results were NDs and will not be qualified.

ICP Serial Dilution

The serial dilution analyses met all QC acceptance criteria.

Other QC

An EB and a field duplicate pair were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result. It should be noted that the EB on AR/COC# 613964 is associated with the samples on AR/COC# 613965.

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 03/08/12

Sample Findings Summary

AR/COC: 613962, 613964, 613965

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	091632-015/CWL-MW9	Nickel (7440-02-0)	J+, CK2
	091638-015/CWL-BW5	Nickel (7440-02-0)	J+, CK2
	091639-015/CWL-BW5	Nickel (7440-02-0)	J+, CK2

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 613962, 613964, 613965 Site/Project: SNL CWL GWM Validation Date: 03.07.12

SDG #: 294334 Laboratory: GEL Validator: Kevin A Lambert

Matrix: aqueous # of Samples: 11 CVR present: yes Analysis Type: [X] Organic [X] Metals

AR/COC(s) present: yes Sample Container Integrity: OK [ ] Rad [ ] Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
All						
	Reported					

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
Met								
	Criteria							

Comments: NOTE - PER CLIENT REQUEST, No validation is required for samples associated w/ COCs 613963 & 613966; samples collected for waste mgt. only

Revised 7/2007

Validated By: Kevin A Lambert

Organic Worksheet (GC/MS)

AR/COC #: 613962, 613964, 613965 SDG #: 294334 Matrix: aqueous

Laboratory Sample IDs: 294334-001, -003, -004, -006, -007, -009, -011

Method/Batch #s: EPA 8260B(VOC) / 1182402 Tuning (pass/fail): Pass TICs Required? (yes/no) No

Analyte (outliers)	Calibration Int.	Calibration RF	Calibration RSD/ R^2	Calibration CCV %D (ICV ✓)	Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/MSD RPD	TB's	EB -004 ①		
Chloroform	✓	✓	✓	✓	✓	10.4	✓	✓	✓	✓	✓	2.08		

Surrogate Recovery Outliers

Sample ID						
	Met Criteria					

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
	Met Criteria											

Comments: QC: another SNL SDG ① applies to -007 & -009

DL: 1X

Inorganic Metals Worksheet

AR/COC #: 613962, 613964, 613965 SDG #: 294334 Matrix: aqueous

Laboratory Sample IDs: 294334-002, -005, -008, -010

Method/Batch #s: EPA 6020 (ICP-MS) / 1181704

ICPMS Mass Cal (pass/fail) Pass ICPMS Resolution (pass/fail) Pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL	CRA/ CRI %R	ETS (1) -005			
	Int.	R^2	ICV	CCV	ICB	CCB													
Cr	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	4.24	✓	✓			
Ni	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	1.91	✓	✓			

IS Outliers				IS Outliers			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
	Met Criteria				Met Criteria		

Comments: QC: another SNL SDG
DL: 1X

(1) applies to -008 & -010

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613962

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/17/12	Project/Task No. 146422.10.11.01	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	135767	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	CWL GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1267 074/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:
Logbook Ref. No.:	ER 049	SMO Contact/Phone:	Lorraine Herrera/505-844-3199		☑ Validation Required
Service Order No.	CF 025-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	**Reference LOV(available at SMO)**			Albuquerque, NM 87185-0154 294334

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
091632-001	CWL-MW9	516	NA	011712\1048	GW	G	3 x 40ml	HCL	G	SA	VOC (Enhanced List) (SW846-8260)	001
091632-015	CWL-MW9	516	NA	011712\1049	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	002
091633-001	CWL-TB1	NA	NA	011712\1048	DIW	G	3x40ml	HCL	G	TB	VOC (Enhanced List) (SW846-8260)	003

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By:

Sample Tracking Smo Use

Date Entered(mm/dd/yy)

Entered by:

☐ **Negotiated TAT** QC inits. b

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

***Send report to:**

Tim Jackson/Org 4142/MS 0729/505-284-2547

Enhanced List : Chloroform, 1,1-DCE, PCE,TCE, Freon 11, Freon 113

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	Alfred Santillanes			SNL/4142/844-5130/228-0710
	Robert Lynch		RL	SNL/4142/844-4013/250-7090
	William J Gibson			SNL/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 1/17/12	Time 1118	4.Relinquished by	Org.	Date	Time
1. Received by	Smo	Org. 4142	Date 1/17/12	Time 1118	4. Received by	Org.	Date	Time
2.Relinquished by	Smo	Org. 4142	Date 1/17/12	Time 1220	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 1-18-12	Time 0735	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

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613964

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/18/12	Project/Task No. 146422.10.11.01	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	136382	SMO Authorization: SMO	-Send preliminary/copy report to:
Project Name:	CWL GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	☐ Released by COC No.:
Record Center Code:	ER/1267 074/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☑ Validation Required
Logbook Ref. No.:	ER 049	SMO Contact/Phone:	Lorraine Herrera/505-844-3199		Bill To: Sandia National Labs (Accounts Payable)
Service Order No.	CF 025-12	Send Report to SMO:			P.O. Box 5800 MS 0154
Location	Tech Area				Albuquerque, NM 87185-0154 294334
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
091636-001	CWL-EB1	NA	NA	01/17/12 1250	DIW	G	3x40ml	HCL	G	EB	VOC (Enhanced List) (SW846-8260)	004
091636-00~~5~~ 15	CWL-EB1	NA	NA	01/17/12 1251	DIW	P	500 ml	HNO3	G	EB	Chromium,Nickel (SW846-6020)	005
091637-001	CWL-TB3	NA	NA	01/17/12 1250	DIW	G	3x40ml	HCL	G	TB	VOC (Enhanced List) (SW846-8260)	006

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT 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:**

Tim Jackson/Org 4142/MS 0729/505-284-2547

Enhanced List : Chloroform, 1,1-DCE, PCE,TCE, Freon 11, Freon 113

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Alfred Santillanes		AS	SNL/4142/844-5130/228-0710
	Robert Lynch		RL	SNL/4142/844-4013/250-7090
	William J Gibson		WJG	SNL/4142/844-4013/239-7367

1.Relinquished by		Org.	4142	Date	1/18/12	Time	1008	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org.	4142	Date	1/18/12	Time	1008	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org.	4142	Date	1/18/12	Time	1115	5.Relinquished by	Org.	Date	Time
2. Received by		Org.	CEC	Date	1-19-12	Time	0730	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

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab

Batch No. N/A

SMO Use

AR/COC 613965

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/18/12	Project/Task No. 146422.10.11.01	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	136382	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	CWL GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1267 074/DAT	Lab Destination:	GEL	SEE BOTTLE ORDER	☐ Released by COC No.:_____
Logbook Ref. No.:	ER 049	SMO Contact/Phone:	Lorraine Herrera/505-844-3199		☑ Validation Required
Service Order No.	CF 025-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154 294334
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
091638-001	CWL-BW5	521	NA	01/18/12 0938	GW	G	3 x 40ml	HCL	G	SA	VOC (Enhanced List) (SW846-8260)	007
091638-~~009~~ 015	CWL-BW5	521	NA	01/18/12 0940	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	008
091639-001	CWL-BW5	521	NA	01/18/12 0938	GW	G	3 x 40ml	HCL	G	DU	VOC (Enhanced List) (SW846-8260)	009
091639-~~009~~ 015	CWL-BW5	521	NA	01/18/12 0940	GW	P	500 ml	HNO3	G	DU	Chromium,Nickel (SW846-6020)	010
091640-001	CWL-TB4	NA	NA	01/18/12 0938	DIW	G	3x40ml	HCL	G	TB	VOC (Enhanced List) (SW846-8260)	011

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By:

Sample Tracking Smo Use

Date Entered(mm/dd/yy)

Entered by:

☐ **Negotiated TAT** QC inits.

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

***Send report to:**

Tim Jackson/Org 4142/MS 0729/505-284-2547

Enhanced List : Chloroform, 1,1-DCE, PCE,TCE, Freon 11, Freon 113

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Alfred Santillanes			SNL/4142/844-5130/228-0710
	Robert Lynch		RL	SNL/4142/844-4013/250-7090
	William J Gibson			SNL/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 1/18/12	Time 1015	4.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 1/18/12	Time 1015	4. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 1/18/12	Time 1115	5.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 1-19-12	Time 0730	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

AR/COC NUMBERS 613967 and 613969

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: March 8, 2012

To: File

From: Kevin Lambert

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 613967 and 613969
SDG: 294631
Laboratory: GEL
Project/Task: 146422.10.11.01
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 3.

Summary

Five samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. 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

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows.

The calibration verification %D for tetrachloroethylene was >20% with a positive bias. The associated sample results were NDs and will not be qualified for the calibration infraction.

Blanks

No target analytes were detected in the blanks except as follows.

In the FB, sample 294631-007, associated with sample -004, chloroform was detected at a concentration > the PQL. The associated sample result was an ND and will not be qualified.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

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

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

TBs and an FB were submitted on the AR/COC(s).

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 03/08/12

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: March 8, 2012

To: File

From: Kevin Lambert

Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 613967 and 613969
SDG: 294631
Laboratory: GEL
Project/Task: 146422.10.11.01
Analysis: Metals

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 3.

Summary

Two samples were prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS metals). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. ICP-MS metals:
   The Ca concentration for sample 294631-002 was > the ICS A Ca concentration and the ICS A result for Ni was > the MDL. The associated sample result was a detect <50X the ICS A results and will be **qualified "J+,CK2."**

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.

ICP-MS Instrument Tune

All instrument tune requirements were met.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

ICP-MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Laboratory Replicate

The replicate analyses met all QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. No samples were diluted.

ICP Interference Check Sample (ICS A and AB)

All ICS A and AB met QC acceptance criteria except as noted above in the summary section and as follows.

ICP-MS metals:
The Ca concentration for sample -002 was > the ICS A Ca concentration and the ICS A result for Cr was > the MDL. However, the associated sample result was an ND and will not be qualified.

ICP Serial Dilution

The serial dilution analyses met all QC acceptance criteria.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 03/08/12

Sample Findings Summary

AR/COC: 613967, 613969

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	091643-015/CWL-MW11	Nickel (7440-02-0)	J+, CK2

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet CWL

AR/COC #: 613967, 613969 Site/Project: SNL GWM Validation Date: 03.08.12

SDG #: 294631 Laboratory: GEL Validator: Kevin A Lambert

Matrix: aqueous # of Samples: 7 CVR present: yes Analysis Type: X Organic X Metals

AR/COC(s) present: yes Sample Container Integrity: OK ☐ Rad ☐ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
	All					
	Reported					

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
	Met.							
	Criteria							

Comments: NOTE - PER CLIENT REQUEST, NO Validation is required for samples associated w/ COCs 613968 & 613970, samples collected for waste mgt only

Revised 7/2007

Validated By: Kevin A Lambert

Organic Worksheet (GC/MS)

AR/COC #: 613967, 613969 SDG #: 294631 Matrix: aqueous

Laboratory Sample IDs: 294631-001, -003, -004, -006, -007

Method/Batch #s: EPA8260B (VOC) / 1184682 Tuning (pass/fail): Pass TICs Required? (yes/no) No

Analyte (outliers)	Calibration ICV Int.	RF	RSD/ R^2	CCV %D	Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	FBU -007	TBS		
Chloroform	NA	✓	✓	✓	✓	10,6	✓	✓	✓	✓	212	✓		
Tetrachloroethylene	NA	✓	✓	24	✓	NA	✓	✓	✓	✓	✓	✓		

Surrogate Recovery Outliers

Sample ID						
	Met Criteria					

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
	Met Criteria											

Comments: QC: -001 ① applies to -004

DL: 1X

Inorganic Metals Worksheet

AR/COC #: 613967, 613969 SDG #: 294631 Matrix: aqueous

Laboratory Sample IDs: 294631-002, -005

Method/Batch #s: EPA 6020 (ICP-MS) / 183392

ICPMS Mass Cal (pass/fail) Pass ICPMS Resolution (pass/fail) Pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL	CRA/ CRI %R				
	Int.	R^2	ICV	CCV	ICB	CCB													
Cr	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	4.24	✓				
Ni	✓	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	1.71	✓				

IS Outliers				IS Outliers			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
	Met			Met			
	Criteria				Criteria		

Comments: QC: -002

DL: 1X

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. NA

SMO Use

AR/COC 613967

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/23/12	Project/Task No. 146422.10.11.01	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	136571	SMO Authorization: Don Schofield SMO	-Send preliminary/copy report to:
Project Name:	CWL GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1267 074/DAT	Lab Destination:	GEL		☐ Released by COC No.:
Logbook Ref. No.:	ER 049	SMO Contact/Phone:	Lorraine Herrera/505-844-3199	See Bottle Order	☑ Validation Required
Service Order No.	CF 025-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	**Reference LOV(available at SMO)**			Albuquerque, NM 87185-0154 294631

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
091643-001	CWL-MW11	513	NA	01/19/12 1308	GW	G	3 x 40ml	HCL	G	SA	VOC (Enhanced List) (SW846-8260)	001
091643-015	CWL-MW11	513	NA	01/19/12 1310	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	002
091644-001	CWL-TB6	NA	NA	01/19/12 1308	DIW	G	3x40ml	HCL	G	TB	VOC (Enhanced List) (SW846-8260)	003

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By:

Sample Tracking Smo Use

Date Entered(mm/dd/yy)

Entered by:

☐ **Negotiated TAT** QC inits.

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

***Send report to:**

Tim Jackson/Org 4142/MS 0729/505-284-2547

Enhanced List : Chloroform, 1,1-DCE, PCE,TCE, Freon 11, Freon 113

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/844-5130/228-0710
	Robert Lynch	Robert Lynch	RL	SNL/4142/844-4013/250-7090
	William J Gibson	William J Gibson	WJG	SNL/4142/844-4013/239-7367
	Gilbert Quintana	Gilbert Quintana	GQ	SNL/4142/844-2507

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 1/23/12	Time 0950	4.Relinquished by		Org.	Date	Time
1. Received by	[illegible]	Org. 4143	Date 1/23/12	Time 0950	4. Received by		Org.	Date	Time
2.Relinquished by	[illegible]	Org. 4143	Date 1/23/12	Time 1100	5.Relinquished by		Org.	Date	Time
2. Received by	[illegible]	Org. GEL	Date 1-24-12	Time 0745	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

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Page 1 of 1

Internal Lab

Batch No. NA

SMO Use

AR/COC 613969

Dept. No./Mail Stop:	4142/1126	Date Samples Shipped:	1/23/12	Project/Task No. 146422.10.11.01	☐ Waste Characterization
Project/Task Manager:	Don Schofield	Carrier/Waybill No.	136571	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	CWL GWM	Lab Contact:	Edie Kent/803-556-8171	Contract #: PO 691436	
Record Center Code:	ER/1267 074/DAT	Lab Destination:	GEL	See Bottle Order	☐ Released by COC No.:
Logbook Ref. No.:	ER 049	SMO Contact/Phone:	Lorraine Herrera/505-844-3199		☑ Validation Required
Service Order No.	CF 025-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	Reference LOV(available at SMO)			Albuquerque, NM 87185-0154 294631

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
091647-001	CWL-MW10	515	NA	012312\0852	GW	G	3 x 40ml	HCL	G	SA	VOC (Enhanced List) (SW846-8260)	004
091647-015	CWL-MW10	515	NA	012312\0853	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	005
091648-001	CWL-TB8	NA	NA	012312\0852	DIW	G	3x40ml	HCL	G	TB	VOC (Enhanced List) (SW846-8260)	006
091649-001	CWL-FB1	NA	NA	012312\0848	DIW	G	3x40ml	HCL	G	FB	VOC (Enhanced List) (SW846-8260)	007

RMMA ☐ Yes ☑ No Ref. No.	Sample Tracking Smo Use	Special Instructions/QC Requirements	Abnormal Conditions on Receipt
Sample Disposal ☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	EDD ☑ Yes ☐ No	
Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	Level D Package ☐ Yes ☑ No	
Return Samples By: ☐ Negotiated TAT QC inits.		*Send report to:	

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Alfred Santillanes			SNL/4142/844-5130/228-0710
	Robert Lynch			SNL/4142/844-4013/250-7090
	William J Gibson			SNL/4142/844-4013/239-7367

Tim Jackson/Org 4142/MS 0729/505-284-2547

Enhanced List : Chloroform, 1,1-DCE, PCE,TCE, Freon 11, Freon 113

*Please list as separate report.

Lab Use

	Org	Date	Time		Org	Date	Time
1.Relinquished by	4142	1/23/12	1000	4.Relinquished by			
1. Received by	4143	1/24/12	1000	4. Received by			
2.Relinquished by	4143	1/23/12	1100	5.Relinquished by			
2. Received by	Cal	1-24-12	0725	5. Received by			
3.Relinquished by				6.Relinquished by			
3. Received by				6. Received by			

CONTRACT VERIFICATION REVIEW FORMS

GROUNDWATER MONITORING

JANUARY 2012

Note: The review forms in this section include AR/COC numbers for environmental samples and additional AR/COC numbers for waste characterization samples.

AR/COC Number	Sample Type
613962	Environmental*
613963	Waste
613964	Environmental*
613965	Environmental*
613966	Waste
613967	Environmental*
613968	Waste
613969	Environmental*
613970	Waste

* These AR/COC forms are provided in the Data Validation Section of this Annex.

Contract Verification Review (CVR)

Project Leader: Schofield | Project Name: CWL GWM | Case No.: 146422_10.11.01

AR/COC No.: 613962, 613963, 613964, 613965, 613966 | Analytical Lab: GEL | SDG No.: 294323

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloroform detected in EB1 (091636-001)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes (No)

Based on the review, this data package is complete. (Yes) No

If no, provide: nonconformance report or correction request number _____ and date correction request was submitted_____

Reviewed by:_____ Date: 02/21/2012 Closed by:_____ Date:_____

Contract Verification Review (CVR)

Project Leader Schofield | Project Name CWL GWM | Case No. 146422_10.11.01

AR/COC No. 613967, 613968, 613969, 613970 | Analytical Lab GEL | SDG No. 294628

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided (if requested)	X				
2.5	Detection limits provided; PQL and MDL (or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloroform detected in FB1 (091649-001)
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"-analyte found in method blank above the MDL for organic or above the PQL for inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"-analysis done beyond the holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and 8082 (pesticides/PCBs)	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330 and 8010 and 8082)	N/A		
a) Initial calibration provided			
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 Inorganics (metals)			
a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.4 Radiochemistry			
a) Instrument run logs provided			

Contract Verification Review (Concluded)

5.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? Yes (No)

Based on the review, this data package is complete. (Yes) No

If no, provide: nonconformance report or correction request number _____ and date correction request was submitted_____

Reviewed by:_____ Date: 02/28/2012 Closed by:_____ Date:_____

FIELD SAMPLING FORMS

JULY 2012 GROUNDWATER MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-BW 5 Date: 07/05/12 Time: 0757

Activities: Groundwater Monitoring
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 71.6 °F Wind Speed: 0 MPH Humidity: 56.2 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~
Other: _____

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert J Lynch	Robert Lynch
ALFRED SANTILLANES	Alfred Santillanes
Tim Jackson	Tim Jackson

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW9 Date: 07/06/12 Time: 0756

Activities: Groundwater Monitoring
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 66.9 °F Wind Speed: 0 MPH Humidity: 54.3 % Wind Chill 66.9 °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~
Other: _____

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	
William Gibson	
ALFRED SANTILLANES	

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW 11 Date: 07/09/12 Time: 0735

Activities: Groundwater Monitoring
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~
Other: _____

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.		☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.		☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.		☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.		☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.		☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
Alfred Santillanes	Alfred Santillanes
William Gibson	William J Gibson Jr

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL- MW 10 Date: 07/10/12 Time: 0744 7/11/12 0750

Activities: Groundwater Monitoring
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: 77 °F Wind Speed: 0 MPH Humidity: 42 % Wind Chill ____ °F

Chemicals Used: Acids in sample containers, standard solutions, ~~Hach ACCU-VAC ampules~~
Other: _____

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.		☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.		☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.		☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.		☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.		☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
ALFRED SANTILLANES	Alfred Santillanes
William Gibson	William Gibson
Robert Lynch 7/11/12	Robert Lynch
ALFRED SANTILLANES	Alfred Santillanes

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William Gibson William Gibson

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

Page 1 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: Robert Lynch	Date: 07/05/12

Make & Model: YSI 6920 V2

YSI ~~6820~~ Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 08H100033

YSI 650 MDS (S/N): N/A

pH Calibration

pH Calibrated to (std): 7.00 | pH sloped to (std): 10.0

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0635	4.01	24.15	6.99	24.16	10.00	24.16
2. Time: 1256	4.00	22.7	7.00	22.7	9.99	22.7
3. Time:						
4. Time:						
Standard lot no.:	2AA670		2AB299		1AK189	
Expiration date:	Jan-14		Feb-14		Nov-13	

SC Calibration

Reference Value: 1278 uS | Standard Lot No.: 2AB388 | Expiration Date: Feb-13

	Value	Temp
1. Time: 0637	1275	22.9
2. Time: 1255	1277	22.7
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 220mV | Standard Lot No. 1AL131 | Expiration Date: Sep-12

	Value	Temp
1. Time: 0636	219.5	24.2
2. Time: 1254	219.7	22.7
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0634	81.5	24.37
2. Time: 1253	81.4	24.38
3. Time:		
4. Time:		

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM		Project No.: 146422.10.11.01		
Calibration done by: Robert Lynch		Date: 07/05/12		
TURBIDIMETER				
Make & Model: HACH ~~2100P~~ 2100Q		Serial No. S/N 10050C002897		
Reference Value	✗10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0806	9.87	19.4	98.5	794
2. Time 1012	9.91	19.6	99.4	792
3. Time				
4. Time				

Comments:

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: Robert Lynch	Date: 07/06/12

Make & Model: YSI 6920 V2

YSI ~~6920~~ Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 08H100033

YSI 650 MDS (S/N): N/A

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.0

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0630	3.99	20.4	7.00	20.4	9.99	20.4
2. Time: 1133	3.98	20.7	7.01	20.7	10.00	20.7
3. Time:						
4. Time:						
Standard lot no.:	2AA670		2AB299		1AK189	
Expiration date:	Jan-14		Feb-14		Nov-13	

SC Calibration

Reference Value: 1278 uS Standard Lot No.: 2AB388

Expiration Date: Feb-13

	Value	Temp
1. Time: 0632	1281	20.4
2. Time: 1135	1280	20.7
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 220mV Standard Lot No. 1AL131

Expiration Date: Sep-12

	Value	Temp
1. Time: 0631	221.1	20.4
2. Time: 1134	222.0	20.7
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0629	81.7	24.43
2. Time: 1132	81.6	24.42
3. Time:		
4. Time:		

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM	Project No.: 146422.10.11.01
Calibration done by: Robert Lynch	Date: 07/06/12

TURBIDIMETER

Make & Model: HACH ~~2100P~~ 2100Q	Serial No. S/N 10050C002897

Reference Value	~~1~~ 10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0812	9.93	19.1	101	799
2. Time 1016	9.87	19.6	100	802
3. Time				
4. Time				

Comments:

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: Robert Lynch	Date: 07/09/12

Make & Model: YSI 6920 V2

YSI ~~6920~~ Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 08H100033

YSI 650 MDS (S/N): N/A

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.0

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0623	4.02	21.0	7.00	21.0	10.01	21.0
2. Time: 1320	4.03	21.3	7.01	21.3	10.01	21.3
3. Time:						
4. Time:						
Standard lot no.:	2AA670		2AB299		1AK189	
Expiration date:	Jan-14		Feb-14		Nov-13	

SC Calibration

Reference Value: 1278 uS Standard Lot No.: 2AB388

Expiration Date: Feb-13

	Value	Temp
1. Time: 0625	1281	21.0
2. Time: 1322	1284	21.3
3. Time:		
4. Time:		

ORP Calibration

Reference Value: 220mV Standard Lot No. 1AL131

Expiration Date: Sep-12

	Value	Temp
1. Time: 0624	219.6	21.0
2. Time: 1321	219.8	21.3
3. Time:		
4. Time:		

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0622	81.7	24.48
2. Time: 1319	81.8	24.51
3. Time:		
4. Time:		

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM	Project No.: 146422.10.11.01
Calibration done by: Robert Lynch	Date: 07/09/12

TURBIDIMETER

Make & Model: HACH ~~2100P~~ 2100Q	Serial No. S/N 10050C002897

Reference Value	~~X~~10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0740	9.87	20.2	101	797
2. Time 1235	9.93	20.1	100	794
3. Time				
4. Time				

Comments:

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM	SNL/NM Project No.: 146422.10.11.01
Calibrations done by: Robert Lynch	Date: 07/10/12 7/11/12

Make & Model: YSI 6920 V2

YSI ~~6820~~ Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 08H100033

YSI 650 MDS (S/N): N/A

pH Calibration

pH Calibrated to (std): 7.00 pH sloped to (std): 10.0

Reference value:	4.00		7.00		10.00	
	Value	Temp	Value	Temp	Value	Temp
1. Time: 0626	3.99	19.7	7.00	19.7	9.99	19.7
2. Time: 1119	4.00	20.2	6.99	20.2	10.01	20.2
3. Time: 0632	4.01	20.4	7.00	20.4	10.02	20.4
4. Time: 0928	4.01	20.5	7.01	20.5	10.01	20.5
Standard lot no.:	2AA670		2AB299		1AK189	
Expiration date:	Jan-14		Feb-14		Nov-13	

SC Calibration

Reference Value: 1278 uS Standard Lot No.: 2AB388

Expiration Date: Feb-13

	Value	Temp
1. Time: 0628	1274	19.7
2. Time: 1121	1277	20.2
3. Time: 0634	1282	20.4
4. Time: 0930	1285	20.5

ORP Calibration

Reference Value: 220mV Standard Lot No. 1AL131

Expiration Date: Sep-12

	Value	Temp
1. Time: 0627	218.6	19.7
2. Time: 1120	219.7	20.2
3. Time: 0633	221.0	20.4
4. Time: 0929	220.7	20.5

DO Calibration

Calibration Value:	81% air saturation @ 5200 ft.	Atmospheric Pressure in Hg
1. Time: 0625	81.9	24.53
2. Time: 1118	81.8	24.55
3. Time: 0631	82.0	24.61
4. Time: 0927	82.1	24.60

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG (continued) Page 2 of 2

SNL/NM Project Name: Chemical Waste Landfill GWM	Project No.: 146422.10.11.01
Calibration done by: Robert Lynch	Date: 07/10/12 07/11/12

TURBIDIMETER

Make & Model: HACH ~~2100P~~ 2100Q	Serial No. S/N 10050C002897

Reference Value	~~X~~ 10	20	100	800
Standard Lot No.	0161	0168	0162	0161
1. Time 0747	9.94	20.0	99.6	802
2. Time 1042	9.87	19.7	101	806
3. Time 0758	10.2	19.8	99.3	800
4. Time 0844	9.98	19.5	99.6	795

Comments:

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Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: Chemical Waste Landfill GWM	**Monitoring Well ID # :** CWL-BW5	**Date:** 07/05/12

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: GWM 1806-32	**Water Level Indicator ID #:** 62088
Personnel Performing Decontamination: ALFRED SANTILLANES — Print Name: — Initial: AS Robert Lynch — Print Name: — Initial: RL	**Personnel Performing Decontamination:** ALFRED SANTILLANES — Print Name: — Initial: AS Robert Lynch — Print Name: — Initial: RL

Condition of Equipment

Pump: good **Tubing Bundle:** good **Water Level Indicator:** good

List of Decontamination Materials

Distilled or **Deonized** (circle one) **Source:** Culligan **Lot Number:** 06182	**HNO_3** **Grade:** Reagent **UN #:** 2031 **Manufacturer:** Fisher Scientific **Lot Number:** 002735

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Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: Chemical Waste Landfill GWM	**Monitoring Well ID # :** CWL-MW9	**Date:** 07/06/10

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: GWM 1806-32	**Water Level Indicator ID #:** 62088
Personnel Performing Decontamination: Robert Lynch — Print Name: — RL — Initial: William Gibson — Print Name: — WJG — Initial:	**Personnel Performing Decontamination:** Robert Lynch — Print Name: — RL — Initial: William Gibson — Print Name: — WJG — Initial:

Condition of Equipment

Pump: good **Tubing Bundle:** good **Water Level Indicator:** good

List of Decontamination Materials

Distilled or **Deonized** (circle one) **Source:** Culligan **Lot Number:** 061812	HNO_3 **Grade:** Reagent **UN #:** 2031 **Manufacturer:** Fisher Scientific **Lot Number:** 002735

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Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: Chemical Waste Landfill GWM	**Monitoring Well ID # :** CWL-MW11	**Date:** 07/09/12

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: CWL 1806-640	**Water Level Indicator ID #:** 62088
Personnel Performing Decontamination: William Gibson — Print Name: — WJG — Initial: Robert Lynch — Print Name: — RL — Initial:	**Personnel Performing Decontamination:** William Gibson — Print Name: — WJG — Initial: Robert Lynch — Print Name: — RL — Initial:

Condition of Equipment

Pump: good **Tubing Bundle:** good **Water Level Indicator:** good

List of Decontamination Materials

Distilled or **Deonized** (circle one)	HNO_3
Source: Culligan	**Grade:** Reagent
Lot Number: 061812	**UN #:** 2031
	Manufacturer: Fisher Scientific
	Lot Number: 002735

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Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: Chemical Waste Landfill GWM	**Monitoring Well ID # :** CWL-MW10	**Date:** 07/11/12

The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: CWL 1806-640	**Water Level Indicator ID #:** 62088
Personnel Performing Decontamination: Robert Lynch — Print Name: — Initial: RL Alfred Santillanes — Print Name: — Initial:	**Personnel Performing Decontamination:** Robert Lynch — Print Name: — Initial: RL Alfred Santillanes — Print Name: — Initial:

Condition of Equipment

Pump: good **Tubing Bundle:** good **Water Level Indicator:** good

List of Decontamination Materials

Distilled or **Deonized** (circle one) **Source:** Culligan **Lot Number:** 070612	**HNO_3** **Grade:** Reagent **UN #:** 2031 **Manufacturer:** Fisher Scientific **Lot Number:** 002735

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: Chemical Waste Landfill GWM	Project No.: 146422.10.11.01
Well I.D.: CWL-BW5	Date: 07/05/12
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump ____ Pump depth: 521'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
509.82	0815	/	START						
513.43	0842	5	20.53	994	195.2	6.67	0.56	83.6	7.56
514.30	0856	10	20.47	997	193.1	6.69	0.68	81.3	7.30
514.75	0911	15	20.51	997	192.2	6.70	0.59	80.0	7.19
514.97	0926	20	20.61	993	192.0	6.70	0.61	79.9	7.16
515.00	0932	22	20.69	1005	191.6	6.71	0.53	80.6	7.21
515.03	0939	24	20.73	1000	190.8	6.71	0.53	80.1	7.16
515.00	0946	26	20.76	1006	190.2	6.73	0.61	79.5	7.09
514.98	0953	28	20.80	1004	190.0	6.71	0.47	80.1	7.15
514.95	0959	30	20.88	1000	189.5	6.71	0.35	80.2	7.15
514.95	1005	32	20.86	999	189.3	6.71	0.37	80.4	7.15
	1006	/	SAMPLING						
									~4.00 gals. purged from tubing 0828

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: Chemical Waste Landfill GWM	Project No.: 146422.10.11.01
Well I.D.: CWL-MW9	Date: 07/06/12
Well Condition:	Weather Condition:
Method: Portable pump ____X____	Dedicated pump _____ Pump depth: 516'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
502.33	0811	✓	START						
506.43	0835	5	20.35	858	157.2	6.78	0.77	9.6	0.87
507.40	0848	10	20.48	849	76.7	6.80	0.72	11.3	1.02
508.06	0901	15	20.60	864	14.7	6.78	0.76	10.6	0.95
508.42	0915	20	20.67	877	1.0	6.78	0.78	11.7	1.05
508.78	0928	25	20.73	881	-3.1	6.77	0.36	14.2	1.28
508.75	0937	28	20.83	886	-6.0	6.77	0.34	16.3	1.45
508.60	0944	30	20.92	887	-2.4	6.78	0.54	17.9	1.59
508.62	0949	32	20.96	889	-3.0	6.77	0.37	19.3	1.72
508.58	0956	34	20.94	889	-2.1	6.77	0.32	20.1	1.78
508.59	1002	36	20.94	889	-1.2	6.77	0.42	21.5	1.90
	1003	✓	SAMPLING						
									~4.00 gals. purged from tubing
									0823

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: Chemical Waste Landfill GWM	Project No.: 146422.10.11.01
Well I.D.: CWL-MW 10	Date: 07/10/12 7/11/12
Well Condition:	Weather Condition:
Method: Portable pump ____X____	Dedicated pump _____ Pump depth: 515'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
499.25	0756	/	START						
504.30	0833	5	21.19	796	160.4	7.00	1.46	34.8	3.09
508.36	0900	10	22.80	790	153.3	7.03	3.67	38.6	3.32
509.70	0910	12	22.64	789	148.5	7.01	5.11	38.4	3.30
511.19	0920	14	22.25	793	117.1	6.99	4.72	35.4	3.07
512.83	0930	16	22.52	799	93.2	6.98	6.86	31.7	2.73
513.42	0940	17	23.99	802	84.7	6.99	6.17	32.1	2.70
514.31	~~0900~~ 0706	18	25.81	808	62.8	7.00	8.07	37.7	3.06
514.68	1017	19	25.79	805	64.6	6.99	5.50	36.8	2.99
515.57	1030	20	24.94	801	53.2	6.98	4.07	33.6	2.77
515.57	1030	/	well DRY						
7/11/12									
503.23	0806	/	START						
503.98	0820	1	23.12	804	137.0	7.16	3.58	65.8	5.61
504.76	0828	2	22.76	807	141.0	7.03	2.04	50.6	4.33
	0829	/	Sampling						
									7/11/12 → 0816
									~1.6 gals. purged
									from tubing
									0806

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN), department home page

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: Chemical Waste Landfill GWM	Project No.: 146422.10.11.01
Well I.D.: CWL- MW 11	Date: 07/09/12
Well Condition:	Weather Condition:
Method: Portable pump X	Dedicated pump _____ Pump depth: 513'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol. (L/gal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments DO mg/L
498.49	0750	/	START						
502.47	0841	5	22.43	938	166.2	6.81	0.70	63.5	5.49
505.24	0907	10	22.78	934	161.9	6.82	0.70	62.3	5.35
507.59	0930	15	23.18	914	158.3	6.83	1.05	53.8	4.59
510.09	0954	20	23.37	906	154.1	6.82	1.36	49.7	4.20
511.53	1025	25	25.11	924	143.0	6.82	1.00	52.9	4.36
512.81	1042	28	23.95	940	144.8	6.81	1.15	63.5	5.32
513.21	1100	30	25.24	938	145.5	6.83	1.08	59.2	4.86
512.99	1125	32	25.27	939	151.0	6.84	0.55	62.1	4.86
513.13	1155	34	25.71	932	155.4	6.83	0.73	64.9	5.10
513.22	1218	36	25.80	931	156.2	6.84	0.65	67.5	5.18
	1219	/	Sampling						
									1.6 gal + 4.00 gals purged from tubing 0805

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN), department home page

SUMMARY SHEET FOR JULY 2012 SAMPLES

Sample Summary for CWL Groundwater Monitoring
4th Quarter FY12

Sample ID	*Sample Date*	*ARCOC*	*Sample Number*	*Sample Type*	*Associated Equipment Blank (ARCOC #/Sample #)*	*Associated Trip Blank (ARCOC # / Sample #)*	*Associated Field Blank (ARCOC # / Sample #)*	*Comments*
CWL GWM: Environmental Samples 146422.10.11.01								
CWL-BW5	5-Jul-12	614274	092579	Environmental	n/a	614275 / 092583	614274 / 092581	Trip blank sample associated with different ARCOC.
CWL-MW9	6-Jul-12	614276	092584	Environmental	n/a	614276 / 092585	614276 / 092586	
CWL-MW10	11-Jul-12	614282	092598	Environmental	614281 / 092596	614282 / 092600	n/a	
CWL-MW10	11-Jul-12	614282	092599	Duplicate	614281 / 092596	614282 / 092600	n/a	
CWL-MW11	9-Jul-12	614279	092591	Environmental	614278 / 092589	614279 / 092593	n/a	
CWL-MW11	9-Jul-12	614279	092592	Duplicate	614278 / 092589	614279 / 092593	n/a	
CWL-EB1	6-Jul-12	614278	092589	Equipment Blank	n/a	614278 / 092590	n/a	Decon prior to CWL-MW11
CWL-EB2	9-Jul-12	614281	092596	Equipment Blank	n/a	614281 / 092597	n/a	Decon prior to CWL-MW10
CWL GWM: Waste Characterization Samples								
CWL-BW5	5-Jul-12	614275	092582	Waste	n/a	614275 / 092583	n/a	No data validation required
CWL-MW9	6-Jul-12	614277	092587	Waste	n/a	614277 / 092588	n/a	No data validation required
CWL-MW10	11-Jul-12	614283	092601	Waste	n/a	614283 / 092602	n/a	No data validation required
CWL-MW11	9-Jul-12	614280	092594	Waste	n/a	614280 / 092595	n/a	No data validation required

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

GROUNDWATER MONITORING

JULY 2012

AR/COC NUMBER 614274

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: July 11, 2012

To: File

From: Ken Salaz

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 614274
SDG: 307311
Laboratory: GEL
Project/Task: 146422.10.11.01
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 3.

Summary

Two samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. 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

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial and continuing calibrations met all QC acceptance criteria.

Blanks

No target analytes were detected in any of the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

The internal standards met all QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met all QC acceptance criteria. It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

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

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

One FB was submitted on the AR/COC, and one TB was submitted on COC 614275, but it was not validated per client instructions.

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 08/22/12

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: August 21, 2012

To: File

From: Ken Salaz

Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 614274
SDG: 307311
Laboratory: GEL
Project/Task: 146422.10.11.01
Analysis: Metals

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 3.

Summary

One sample was prepared and analyzed with approved procedures using method EPA6020 (ICP-MS). 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 sample was prepared and analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

The instrument tunes met all QC requirements.

Calibration

The initial and continuing calibrations met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in any of the blanks.

ICP -MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

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

Laboratory Replicate

The replicate analysis met all QC acceptance criteria. It should be noted that the replicate analysis was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The sample was not diluted.

ICP Interference Check Sample (ICS A and AB)

Results for Al, Ca, Fe, and Mg were not reported. Therefore, their concentrations in the sample were assumed to be comparable to those in the ICS A and AB analyses, and they were evaluated. The ICS A and ICS AB analyses met QC acceptance criteria.

ICP Serial Dilution

All serial dilution %Ds met QC acceptance criteria. It should be noted that the serial dilution analysis was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 08/22/12

Sample Findings Summary

AR/COC: 614274

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 814274 Site/Project: GWL GWM Validation Date: 8/20/12

SDG #: 307311 Laboratory: GEL Validator: Kenneth Salaz

Matrix: water # of Samples: 7 CVR present: Yes Analysis Type: ☒Organic ☒Metals

AR/COC(s) present: Yes Sample Container Integrity: OK ☐Rad ☒Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments:

Revised 7/2007

Validated By:

Organic Worksheet (GC/MS)

AR/COC #: 614274 SDG #: 307311 Matrix: water

Laboratory Sample IDs: 307311-001, -003 (FB) ; 307313-006 (TB) => NOT validated (from 614275)

Method/Batch #s: 12 305CC/EPA 8260B Tuning (pass/fail): Pass TICs Required? (yes/no) Pass

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R (1)	MSD %R	MS/MSD RPD	FB	5X FB	TB	5X TB
	Int.	RF	RSD/ R^2	CCV %D										
None	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	NA	✓	NA

Surrogate Recovery Outliers

Sample ID						
None						

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments: (1) MS/MSD on SVL from another SDG (307376)

Inorganic Metals Worksheet

AR/COC #: 614274 SDG #: 307311, 307309 Matrix: water

Laboratory Sample IDs: 307311-002, 307309-003 (FLTB)

Method/Batch #s: EPA6020(ICP-MS)/1227890

ICPMS Mass Cal (pass/fail) Pass ICPMS Resolution (pass/fail) Pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	① MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL (µg/L)	CRA/ CRI %R	FLTB			
	Int.	R^2	ICV	CCV	ICB	CCB													
Cr	✓	NA	✓	✓	✓	✓	✓	NA	✓	✓	✓	NA	✓	3.1	✓	✓			
Ni	✓	NA	✓	✓	✓	✓	✓	NA	✓	✓	✓	NA	✓	3.05	✓	✓			

IS Outliers				IS Outliers			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None							

Comments: ① Matrix QC on SVL Sediment water SDG (307396)

SMO 2012-ARCOC (4-2012)

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

AOP 95-16

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 614274

Project Name:	CWL GWM	Date Samples Shipped:	7/5/12	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	143540	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF 025-12	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 691436	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 307311
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
092579	-001	CWL-BW5	521	7/5/12 10:06	GW	G	3x40ml	HCL	G	SA	Trichloroethene (SW846-8260)	001
092579	-015	CWL-BW5	521	7/5/12 10:07	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	002
092581	-001	CWL-FB1	NA	7/5/12 9:40	DIW	G	3x40ml	HCL	G	FB	Trichloroethene (SW846-8260)	003

Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐
			Sample Disposal ☐ Return to Client ☑ Disposal by Lab
			Return Samples By:
			Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
			See COC # 614275 for trip blank info.

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	Tim Jackson	T-Jackson	TJ	SNL/4142/505-284-2547

1.Relinquished by	Alfred Santillanes	Org.	4142	Date	7/5/12	Time	1031	3.Relinquished by
1. Received by	SMO	Org.	4142	Date	7/5/12	Time	1037	3. Received by
2.Relinquished by	SMO	Org.	4142	Date	7/5/12	Time	1135	4.Relinquished by
2. Received by		Org.	GEL	Date	7-6-12	Time	0752	4. Received by

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 614275

Project Name:	CWL GWM	Date Samples Shipped:	7/5/12	SMO Authorization:	☑ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	143540	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF025-12	Lab Destination:	GEL	Send Report to SMO:	☑ 1° Celsius
		Contract No.:	PO 691436	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 30TB13
Tech Area:					
Building:	Room:	Operational Site:			

	Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
1	092582	-001	CWL-BW5	521	7/5/12 9:44	PW	G	3x40ml	HCL	G	WC	TCL VOC (SW846-8260)	001
1	092582	-009	CWL-BW5	521	7/5/12 9:45	PW	P	500 ml	HNO3	G	WC	TAL Metals+Mo(SW846-6010/6020/7	002
2	092582	-016	CWL-BW5	521	7/5/12 9:46	PW	P	125 ml	4C	G	WC	Anions (SW846-9056)	003
4	092582	-026	CWL-BW5	521	7/5/12 9:47	PW	AG	250 ml	H2SO4	G	WC	Total Phenolics (SW846-9066)	004
4	092582	-027	CWL-BW5	521	7/5/12 9:48	PW	P	250 ml	NaOH	G	WC	Total Cyanide (SW846-9012)	005
1	092583	-001	CWL-TB2	NA	7/5/12 9:44	DIW	G	3x40ml	HCL	G	TB	TCL VOC (SW846-8260)	006

Last Chain:	☐ Yes	**Sample Tracking**	**SMO Use**
Validation Req'd:	☐ Yes	Date Entered:	
Background:	☐ Yes	Entered by:	
Confirmatory:	☐ Yes	QC inits.:	

Special Instructions/QC Requirements:

EDD ☑ Yes ☐ No

Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ Day

Negotiated TAT ☐

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Anions as Br,Cl,F,SO4

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	Tim Jackson	Tim Jackson 7/6/12	TJ	SNL/4142/505-284-2547

1.Relinquished by	Alfred Santillanes	Org.	4142	Date	7/5/12	Time	1030	3.Relinquished by	Org. Date Time
1. Received by	SMO	Org.	4142	Date	7/5/12	Time	1030	3. Received by	Org. Date Time
2.Relinquished by	SMO	Org.	4142	Date	7/5/12	Time	1135	4.Relinquished by	Org. Date Time
2. Received by		Org.	CEL	Date	7-6-12	Time	0750	4. Received by	Org. Date Time

***Prior confirmation with SMO required for 7 and 15 day TAT**

AR/COC NUMBER 614276

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: August 22, 2012

To: File

From: Ken Salaz

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 614276
SDG: 307395
Laboratory: GEL
Project/Task: 146422.10.11.01
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 3.

Summary

Three samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. 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

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial and continuing calibrations met all QC acceptance criteria.

Blanks

No target analytes were detected in any of the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

The internal standards met all QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met all QC acceptance criteria. It should be noted that the MS/MSD analyses were performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

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

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

One FB and one TB were submitted on the AR/COC.

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 08/22/12

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: August 22, 2012

To: File

From: Ken Salaz

Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 614276
SDG: 307395
Laboratory: GEL
Project/Task: 146422.10.11.01
Analysis: Metals

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 3.

Summary

One sample was prepared and analyzed with approved procedures using method EPA6020 (ICP-MS). 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 sample was prepared and analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

The instrument tunes met all QC requirements.

Calibration

The initial and continuing calibrations met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in any of the blanks.

ICP -MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

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

Laboratory Replicate

The replicate analysis met all QC acceptance criteria. It should be noted that the replicate analysis was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The sample was not diluted.

ICP Interference Check Sample (ICS A and AB)

Results for Al, Ca, Fe, and Mg were not reported. Therefore, their concentrations in the sample were assumed to be comparable to those in the ICS A and AB analyses, and they were evaluated. The ICS A and ICS AB analyses met QC acceptance criteria.

ICP Serial Dilution

All serial dilution %Ds met QC acceptance criteria. It should be noted that the serial dilution analysis was performed on an SNL sample of similar matrix from another SDG. No sample data will be qualified as a result.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 08/22/12

Sample Findings Summary

AR/COC: 614276

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 614276 Site/Project: CWL GWM Validation Date: 8/22/12

SDG #: 307395 Laboratory: GEL Validator: Kenneth Sulzer

Matrix: water # of Samples: 4 CVR present: Yes Analysis Type: ☒ Organic ☒ Metals

AR/COC(s) present: Yes Sample Container Integrity: C ☐ Rad ☐ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments:

Revised 7/2007

Validated By:

Organic Worksheet (GC/MS)

AR/COC #: 614276 SDG #: 30 Matrix: water

Laboratory Sample IDs: 307395, ~~307396~~ -001, -003, -004

Method/Batch #s: EPA 8260B (VOCs)/1230500 Tuning (pass/fail): Pass TICs Required? (yes/no) No

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	TB	SB		
	Int.	RF	RSD/ R^2	CCV %D										
None	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓		

Surrogate Recovery Outliers

Sample ID						

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments: (MS/MSD) on SVL Sum and new SDG

Inorganic Metals Worksheet

AR/COC #: 614276 SDG #: 3 Matrix: water

Laboratory Sample IDs: 307395-003

Method/Batch #s: EPA6020(28-ms)/1227890

ICPMS Mass Cal (pass/fail) Pass ICPMS Resolution (pass/fail) Pass

Analyte (outliers)	Calibration						Method Blank	5X Blank or 5X MDL	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL (µg/L)	CRA/ CRI %R				
	Int.	R^2	ICV	CCV	ICB	CCB													
Cr	✓	NA	✓	✓	✓	✓	✓	NA	✓	✓	✓	NA	✓	3.1	✓				
Ni	✓	ND	✓	✓	✓	✓	✓	NA	✓	✓	✓	ND	✓	3.05	✓				

IS Outliers				IS Outliers			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None							

Comments:

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. Na

AR/COC 614276

SMO Use

Project Name:	CWL GWM	Date Samples Shipped:	7/6/12	SMO Authorization:	Dan Stinger SMO
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	143587	SMO Contact Phone:	See bottle order
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171		Lorraine Herrera/505-844-3199
Service Order:	CF 025-12	Lab Destination:	GEL	Send Report to SMO:	
		Contract No.:	PO 691436		Rita Kavanaugh/505-284-2553
Tech Area:					
Building:	Room:	Operational Site:			

☐ Waste Characterization
☐ RMMA
☐ Released by COC No.
☑ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 307395

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
092584	-001	CWL-MW9	516	7/6/12 10:03	GW	G	3x40ml	HCL	G	SA	Trichloroethene (SW846-8260)	001
092584	-015	CWL-MW9	516	7/6/12 10:04	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	002
092585	-001	CWL-TB3	NA	7/6/12 10:03	DIW	G	3x40ml	HCL	G	TB	Trichloroethene (SW846-8260)	003
092586	-001	CWL-FB2	NA	7/6/12 9:46	DIW	G	3x40ml	HCL	G	FB	Trichloroethene (SW846-8260)	004

Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐

Conditions on Receipt

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robt Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Lab Use

1. Relinquished by	Alfred Santillanes	Org. 4142	Date 7/6/12	Time 1034	3. Relinquished by		Org.	Date	Time
1. Received by	Dan Stinger	Org. 4142	Date 7/6/12	Time 1034	3. Received by		Org.	Date	Time
2. Relinquished by	Dan Stinger	Org. 4142	Date 1100	Time	4. Relinquished by		Org.	Date	Time
2. Received by	Mike Taylor	Org. GEL	Date 7-7-12	Time 0925	4. Received by		Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

AR/COC NUMBERS 614278, 614279, 614281, 614282

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: August 27, 2012

To: File

From: Ken Salaz

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 614278, 614279, 614281, 614282
SDG: 307446
Laboratory: GEL
Project/Task: 146422.10.11.01
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 3.

Summary

Ten samples were prepared and analyzed with accepted procedures using method EPA 8260B (VOCs). All compounds were successfully analyzed. 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

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial and continuing calibrations met all QC acceptance criteria.

Blanks

No target analytes were detected in any of the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

The internal standards met all QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD analyses met all QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

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

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Four TBs, two EBs, and two field duplicates were submitted on the AR/COC. There are no "required" review criteria for field duplicate analyses comparability. No sample data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 08/28/12

ANALYTICAL QUALITY ASSOCIATES, INC.

PO Box 21987
Albuquerque, NM 87154
1-888-678-5447
www.aqainc.net

Memorandum

Date: August 27, 2012

To: File

From: Ken Salaz

Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 614278, 614279, 614281, 614282
SDG: 307446
Laboratory: GEL
Project/Task: 146422.10.11.01
Analysis: Metals

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 3.

Summary

Six samples were prepared and analyzed with approved procedures using method EPA6020 (ICP-MS). Data were reported for all required analytes. Problems were identified with the data package that result in the qualification of data.

1. In the MB, Ni was detected. The associated results of samples 307446-005 & -010 were detects <5X the blank concentration and, therefore, will be **qualified 0.00264U, B**.

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 prepared and analyzed within the prescribed holding times and properly preserved.

ICP-MS Instrument Tune

The instrument tunes met all QC requirements.

Calibration

The initial and continuing calibrations met all QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria.

Blanks

No target analytes were detected in any of the blanks except as noted above in the Summary section and as follows. Ni was detected in one EB. This result was qualified U due to MB contamination and was therefore not applied to associated field samples.

ICP -MS Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike (MS)

All MS recoveries met QC acceptance criteria.

Laboratory Replicate

The replicate analysis met all QC acceptance criteria.

Laboratory Control Sample (LCS)

All LCS recoveries met QC acceptance criteria.

Detection Limits/Dilutions

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

ICP Interference Check Sample (ICS A and AB)

Results for Al, Ca, Fe, and Mg were not reported. Therefore, their concentrations in the sample were assumed to be comparable to those in the ICS A and AB analyses, and they were evaluated. The ICS A and ICS AB analyses met all QC acceptance criteria.

ICP Serial Dilution

All serial dilution %Ds met QC acceptance criteria.

Other QC

Two EBs and two field duplicates were submitted on the AR/COC. There are no "required" review criteria for field duplicate analyses comparability. No sample data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Marcia Hilchey **Date**: 08/28/12

Sample Findings Summary

AR/COC: 614278, 614279, 614281, 614282

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	092591-015/CWL-MW11	Nickel (7440-02-0)	0.00264U, B
	092596-015/CWL-EB2	Nickel (7440-02-0)	0.00264U, B

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 614278_79_81_82 Site/Project: CWL GWM Validation Date: 8/20/12

SDG #: 307446, ~~307517~~ Laboratory: GEL Validator: Kenneth Salaz

Matrix: water # of Samples: 10 CVR present: Yes Analysis Type: ☒ Organic ☒ Metals

AR/COC(s) present: Yes Sample Container Integrity: OK ☐ Rad ☐ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
None						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
None								

Comments:

Revised 7/2007

Validated By: Kenneth Salaz

Organic Worksheet (GC/MS)

AR/COC #: 614278_79_81_82 SDG #: 307446 Matrix: water

Laboratory Sample IDs: 307446-001, 3, 4, 6, 8, 9, 11, 12, 14, 16

Method/Batch #s: EPA 8260B (VOA) / 1230698 Tuning (pass/fail): Pass TICs Required? (yes/no) No

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/ MSD RPD	(4) TB	(2) EB		
	Int.	RF	RSD/ R^2	CCV %D										
	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓		
None														

Surrogate Recovery Outliers

Sample ID						
None						

IS Outliers

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments:

Inorganic Metals Worksheet

AR/COC #: 614278_79_81_82 SDG #: 307446 Matrix: water

Laboratory Sample IDs: 307446 -002, -5, -7, -10, -13, -15

Method/Batch #s: EPA6020 (ICP-MS) / 1231980

ICPMS Mass Cal (pass/fail) Pass ICPMS Resolution (pass/fail) Pass

Analyte (outliers)	Calibration						Method Blank (µg/L)	5X Blank or 5X MDL (µg/L)	LCS %R	MS %R	Lab Rep. RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL	CRA/ CRI %R	(2) EB (1) (µg/L)	5X EB		
	Int.	R^2	ICV	CCV	ICB	CCB													
Ni	✓	NA	✓	✓	✓	✓	0.528	2.64	✓	✓	✓	NA	✓	✓	✓	0.573	2.865		

IS Outliers				IS Outliers			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None							

Comments: (1) EB hit applies to samples -013 & -015 only → qual: ND due to MB.

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. N/A

SMO Use

AR/COC 614278

Project Name:	CWL GWM	Date Samples Shipped:	7/9/12	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	4361 4	SMO Contact Phone:	☐ RMMA
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF 025-12	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 691436	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 307446
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preserv-ative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
092589	-001	CWL-EB1	NA	7/6/12 13:30	DIW	G	3x40ml	HCL	G	EB	Trichloroethene (SW846-8260)	001
092589	-015	CWL-EB1	NA	7/6/12 13:31	DIW	P	500 ml	HNO3	G	EB	Chromium,Nickel (SW846-6020)	002
092590	-001	CWL-TB5	NA	7/6/12 13:30	DIW	G	3x40ml	HCL	G	TB	Trichloroethene (SW846-8260)	003

Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐
			Sample Disposal ☐ Return to Client ☑ Disposal by Lab
			Return Samples By:
			Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes			SNL/4142/505-844-5130/505-228-0710
	William Gibson		N/A	SNL/4142/505-284-3307/505-239-7367

1.Relinquished by		Org. 4142	Date 7/9/12	Time 0905	3.Relinquished by	Org.	Date	Time
1. Received by	SMO	Org. 4142	Date 7/9/12	Time 0905	3. Received by	Org.	Date	Time
2.Relinquished by	SMO	Org. 4142	Date 7/9/12	Time 1100	4.Relinquished by	Org.	Date	Time
2. Received by		Org. C2L	Date 7-10-12	Time 0740	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012) ✓

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. NA

SMO Use

AR/COC 614279

Project Name:	CWL GWM	Date Samples Shipped:	7/10/12	SMO Authorization:	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	143558	SMO Contact Phone: See Bottle Order	☐ RMMA
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	☐ Released by COC No.
Service Order:	CF 025-12	Lab Destination:	GEL	Send Report to SMO:	☑ 4° Celsius
		Contract No.:	PO 691436	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 307446
Tech Area:					
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
✓ 092591	-001	CWL-MW11	513	7/9/12 12:19	GW	G	3x40ml	HCL	G	SA	Trichloroethene (SW846-8260)	004
✓ 092591	-015	CWL-MW11	513	7/9/12 12:21	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	005
✓ 092592	-001	CWL-MW11	513	7/9/12 12:19	GW	G	3x40ml	HCL	G	DU	Trichloroethene (SW846-8260)	006
✓ 092592	-015	CWL-MW11	513	7/9/12 12:21	GW	P	500 ml	HNO3	G	DU	Chromium,Nickel (SW846-6020)	007
✓ 092593	-001	CWL-TB6	NA	7/9/12 12:19	DIW	G	3x40ml	HCL	G	TB	Trichloroethene (SW846-8260)	008

Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch		RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes		AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson		WG	SNL/4142/505-284-3307/505-239-7367

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

1.Relinquished by		Org. 4142	Date 7-10-12	Time 0811	3.Relinquished by	Org.	Date	Time
1. Received by		Org. 4142	Date 7-10-12	Time 0811	3. Received by	Org.	Date	Time
2.Relinquished by		Org. 4142	Date 7-10-12	Time 0910	4.Relinquished by	Org.	Date	Time
2. Received by		Org. GEL	Date 7-11-12	Time 0730	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. NA

SMO Use

AR/COC 614281

Project Name:	CWL GWM	Date Samples Shipped:	7/10/12	SMO Authorization:	Don Victorian SMO
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	143558	SMO Contact Phone:	See bottle order
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171		Lorraine Herrera/505-844-3199
Service Order:	CF 025-12	Lab Destination:	GEL	Send Report to SMO:	
		Contract No.:	PO 691436		Rita Kavanaugh/505-284-2553
Tech Area:					
Building:	Room:	Operational Site:			

☐ Waste Characterization
☐ RMMA
☐ Released by COC No.
☑ 4° Celsius

Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 307446

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
092596	-001	CWL-EB2	NA	7/9/12 14:26	DIW	G	3x40ml	HCL	G	EB	Trichloroethene (SW846-8260)	009
092596	-015	CWL-EB2	NA	7/9/12 14:28*	DIW	P	500 ml	HNO3	G	EB	Chromium,Nickel (SW846-6020)	010
092597	-001	CWL-TB8	NA	7/9/12 14:26	DIW	G	3x40ml	HCL	G	TB	Trichloroethene (SW846-8260)	011

Last Chain:	☐ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐
			Sample Disposal ☐ Return to Client ☑ Disposal by Lab
			Return Samples By:
			Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WG	SNL/4142/505-284-3307/505-239-7367

1.Relinquished by	William Gibson	Org. 4142	Date 7-10-12	Time 0811	3.Relinquished by	Org.	Date Time
1. Received by	Don Victorian	Org. 4142	Date 7-10-12	Time 0811	3. Received by	Org.	Date Time
2.Relinquished by	Don Victorian	Org. 4142	Date 7/10/12	Time 1000	4.Relinquished by	Org.	Date Time
2. Received by		Org. Ger	Date 7-10-12	Time 0740	4. Received by	Org.	Date Time

*Prior confirmation with SMO required for 7 and 15 day TAT

SMO 2012-ARCOC (4-2012) ✓

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. NA

AR/COC 614282

SMO Use

Project Name:	CWL GWM	Date Samples Shipped:	7/11/12	SMO Authorization:	Don Watenpaugh
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	143681	SMO Contact Phone:	Bac Bttc order
Project/Task Number:	146422.10.11.01	Lab Contact:	Edie Kent/803-556-8171		Lorraine Herrera/505-844-3199
Service Order:	CF 025-12	Lab Destination:	GEL	Send Report to SMO:	
		Contract No.:	PO 691436		Rita Kavanaugh/505-284-2553
Tech Area:					
Building:	Room:	Operational Site:			

☐ Waste Characterization
☐ RMMA
☐ Released by COC No.
☑ 4° Celsius

Bill to:Sandia National Laboratories (Accounts Payable),
P.O. Box 5800, MS-0154
Albuquerque, NM 87185-0154 307446

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
092598	-001	CWL-MW10	513	7/11/12 8:29	GW	G	3x40ml	HCL	G	SA	Trichloroethene (SW846-8260)	012
092598	-015	CWL-MW10	513	7/11/12 8:31	GW	P	500 ml	HNO3	G	SA	Chromium,Nickel (SW846-6020)	013
092599	-001	CWL-MW10	513	7/11/12 8:29	GW	G	3x40ml	HCL	G	DU	Trichloroethene (SW846-8260)	014
092599	-015	CWL-MW10	513	7/11/12 8:31	GW	P	500 ml	HNO3	G	DU	Chromium,Nickel (SW846-6020)	015
092600	-001	CWL-TB9	NA	7/11/12 8:29	DIW	G	3x40ml	HCL	G	TB	Trichloroethene (SW846-8260)	016

Last Chain:	☑ Yes	Sample Tracking SMO Use	Special Instructions/QC Requirements:
Validation Req'd:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No
Background:	☐ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ Day
Confirmatory:	☐ Yes	QC inits.:	Negotiated TAT ☐
			Sample Disposal ☐ Return to Client ☑ Disposal by Lab
			Return Samples By:
			Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	William Gibson	William Gibson	WJG	SNL/4142/505-284-3307/505-239-7367

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 7/11/12	Time 0910	3.Relinquished by	Org.	Date	Time
1. Received by	Don Watenpaugh	Org. 4142	Date 7/11/12	Time 0910	3. Received by	Org.	Date	Time
2.Relinquished by	Don Watenpaugh	Org. 4142	Date 7/11/12	Time 1100	4.Relinquished by	Org.	Date	Time
2. Received by	Mike Sanders	Org. CEL	Date 7-12-12	Time 0745	4. Received by	Org.	Date	Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT VERIFICATION REVIEW FORMS

GROUNDWATER MONITORING

JULY 2012

Note: The review forms in this section include AR/COC numbers for environmental samples and additional AR/COC numbers for waste characterization samples.

AR/COC Number	Sample Type
614274	Environmental*
614275	Waste
614276	Environmental*
614277	Waste
614278	Environmental*
614279	Environmental*
614280	Waste
614281	Environmental*
614282	Environmental*
614283	Waste

* These AR/COC forms are provided in the Data Validation Section of this Annex.

Contract Verification Review (CVR)

Project Leader Jackson | Project Name CWL GWM | Project/Task No. 146422_10.11.01

AR/COC No. 614274, 614275 | Analytical Lab GEL | SDG No. 307311

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided	X				
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met		X	MS recovery for Total Phenols failed high
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs 8081 and 8082.	N/A		

Contract Verification Review (Continued)

4.0 Calibrations and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		
f) RRTs for samples and standards provided	N/A		

g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Continued)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for all monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab		X	

Contract Verification Review (Concluded)

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide: nonconformance report or correction request number _____ or date correction request was submitted: _____

Reviewed by: _____ Date: 08/08/2012 Closed by: _____ Date_____

Contract Verification Review (CVR)

Project Leader Jackson | Project Name CWL GWM | Project/Task No. 146422_10.11.01

AR/COC No. 614276, 614277 | Analytical Lab GEL | SDG No. 307395

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided	X				
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met		X	MS recovery failed high for Total Phenols
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs 8081 and 8082.	N/A		

Contract Verification Review (Continued)

4.0 Calibrations and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Instrument run logs provided	N/A		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		
f) RRTs for samples and standards provided	N/A		

g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Continued)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for all monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab		X	

Contract Verification Review (Concluded)

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide: nonconformance report or correction request number _____ or date correction request was submitted: _____

Reviewed by: _____ Date: 08/08/2012 Closed by: _____ Date_____

Contract Verification Review (CVR)

Project Leader	Jackson	Project Name	CWL GWM	Project/Task No.	146422_10.11.01
AR/COC No.	614278, 614279, 614280, 614281, 614282, 614283	Analytical Lab	GEL	SDG No.	307449

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided	X				
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	X		
c) Matrix spike recovery data reported and met	X		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	X		
3.5 Blank data a) Method or reagent blank data reported and met for all samples		X	Detected in Method Blank: Nickel (Batch #1231980); Copper (Batch #1231984)
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Nickel detected in EB2 (092596-015)
3.6 Contractual qualifiers provided: “J”- estimated quantity; “B”- analyte found in method blank above the MDL for organic and inorganic; “U”- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); “H”- analysis done beyond the holding time; “h” - analysis done beyond the extraction/preparation holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs 8081 and 8082.	N/A		

Contract Verification Review (Continued)

4.0 Calibrations and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668)	N/A		
a) 12-hour tune check provided			
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		
f) RRTs for samples and standards provided	N/A		

g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	X		
b) Continuing calibration provided	X		
c) ICP interference check sample data provided	X		
d) ICP serial dilution provided	X		
e) Instrument run logs provided	X		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Continued)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for all monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted		X	
5.3 Verification or reanalysis requested from lab		X	

Contract Verification Review (Concluded)

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide: nonconformance report or correction request number _____ or date correction request was submitted: _____

Reviewed by: _____ Date: 08/14/2012 Closed by: _____ Date_____

ANNEX B
Chemical Waste Landfill
CY 2012 Soil Gas Monitoring Forms and Reports

Field Forms

Data Validation Reports

Contract Verification Reports

Certificates of Analysis – provided on CD in plastic sleeve insert

FIELD SAMPLING FORMS

CWL POST-CLOSURE CARE SOIL-GAS MONITORING

Form Title	Corresponding Procedure
Tailgate Safety Briefing	PLA 05-09
SUMMA® Canister Log	FOP 08-22
Soil Vapor Sampling Form	FOP 08-22
Analysis Request and Chain of Custody*	LOP 94-03

*Completed AR/COC forms are provided in the Data Validation Section of this Annex.

FIELD SAMPLING FORMS

CALENDAR YEAR 2012 SOIL-GAS MONITORING

TAILGATE SAFETY BRIEFING

Facility: CWL Date: 1/25/12 Time: 0800

Activities: SOIL VAPOR SAMPLING
CWL-UI-1
CWL-UI-2

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Safety Topics Presented

☑ Wear safety glasses as needed	☑ Wear leather gloves when needed
☑ Wear safety boots	☑ Be aware of electrical hazards
☑ Wear hearing protection as needed	☑ Use safe lifting practices
☑ Be aware of biohazards (snakes, spiders, etc.)	☑ Be aware of slips, trips, and falls
☑ Perform appropriate inspections for equipment used	☑ Eating or drinking allowed in designated areas only
☑ Proper housekeeping will be maintained	☐
☐	☐

Does anyone have any weight restrictions on lifting? Circle **YES** or **NO**. If answered **YES** explain.

Presenter

Printed Name	Signature
William Gibson	William J Gibson

Attendees

Printed Name	Signature
ALFRED SANTILLANES	Alfred Santillanes
Robert Lynch	Robert Lynch

Notes

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TAILGATE SAFETY BRIEFING

Facility: CWL Date: 1/26/12 Time: 0800

Activities: SOIL VAPOR SAMPLING

CWL-D1 12/5/12

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Safety Topics Presented

☑ Wear safety glasses as needed	☑ Wear leather gloves when needed
☑ Wear safety boots	☑ Be aware of electrical hazards
☑ Wear hearing protection as needed	☑ Use safe lifting practices
☑ Be aware of biohazards (snakes, spiders, etc.)	☑ Be aware of slips, trips, and falls
☑ Perform appropriate inspections for equipment used	☑ Eating or drinking allowed in designated areas only
☑ Proper housekeeping will be maintained	☐
☑	☐

Does anyone have any weight restrictions on lifting? Circle **YES** or **NO**. If answered **YES** explain.

Presenter

Printed Name	Signature
William Gibson	William J Gibson

Attendees

Printed Name	Signature
ALFRED SANTILLANES	Alfred Santillanes
Robert Lynch	Robt Lynch

Notes

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TAILGATE SAFETY BRIEFING

Facility: CWL Date: 1/27/12 Time: 0754

Activities: Soil Vapor sampling CWL-D2

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Safety Topics Presented

☑ Wear safety glasses as needed	☑ Wear leather gloves when needed
☑ Wear safety boots	☑ Be aware of electrical hazards
☑ Wear hearing protection as needed	☑ Use safe lifting practices
☑ Be aware of biohazards (snakes, spiders, etc.)	☑ Be aware of slips, trips, and falls
☑ Perform appropriate inspections for equipment used	☑ Eating or drinking allowed in designated areas only
☑ Proper housekeeping will be maintained	☐
☐	☐

Does anyone have any weight restrictions on lifting? Circle **YES** or **NO**. If answered **YES** explain.

Presenter

Robert Lynch (Printed Name) — Signature

Attendees

Printed Name	Signature
ALFRED SANTILLANES	
Gilbert L. Quintana	
William Gibson	

Notes

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TAILGATE SAFETY BRIEFING

Facility: CWL Date: 1/30/12 Time: 0758

Activities: SOIL VAPOR SAMPLING CWL-D3

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Safety Topics Presented

☑ Wear safety glasses as needed	☑ Wear leather gloves when needed
☑ Wear safety boots	☑ Be aware of electrical hazards
☑ Wear hearing protection as needed	☑ Use safe lifting practices
☑ Be aware of biohazards (snakes, spiders, etc.)	☑ Be aware of slips, trips, and falls
☑ Perform appropriate inspections for equipment used	☑ Eating or drinking allowed in designated areas only
☑ Proper housekeeping will be maintained	☐
☐	☐

Does anyone have any weight restrictions on lifting? Circle **YES** or **NO**. If answered **YES** explain.

Presenter

Printed Name: Robert Lynch — Signature: Robert Lynch

Attendees

Printed Name	Signature
ALFRED SANTILLANES	Alfred Santillanes
William Gibson	William Gibson

Notes

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1/20/12 NEGITIVE PRETSURE GAUGE NOT INCLUSED IN SHIPMENT

SUMMA® Canister Log

Serial #	Date Received	Date Tested for Initial VAC	Initial VAC at 5400 ft (in. Hg)	Date Used	End VAC at 5400 ft (in. Hg)	Date Returned to SMO
34000562	1/20/12	1/25/12	-27	1/25/12	-8	1/30/12
34000530			-26		-8	
34000569			-28		-8	
34000574			-29		-8	
34001071			-29		-8	
34000165			-26		-8	
34000670			-29		-8	
34000137			-29		-8	
34000308			-29		-8	
34000275	1/20/12	1/26/12	-29	1/26/12	-8	
34000156			-29		-8	
34000062			-27		-8	
34000439			-27		-8	
34000265			-29		-8	
34000160			-29		-8	
34000546			-29		-8	
34000393		1/27/12	-29	1/27/12	-6	
34001082			-29		-6	
34000466			-28		-8	
34000189			-28		-8	
34000575			-29		-8	
34000630			-30		-7	
34000187		1/30/12	-27	1/30/12	-8	
34000122			-25		-8	
34000181			-28		-28	
34000391			-28		-8	
34000392			-28		-8	
34000557			-29		-6	
34000148			-29		-8	

SUMMA® Canister Log completed by:

ALFRED SANTILLANES
Printed Name

Alfred Santillanes
Signature

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-UI-1-120	1/25/12	0825	N/A	0.0	N/A	N/A	PID background
		0830		0.0			reading 0.3
		0835		0.3			
		0840		0.2			Flow Rate. ~~0.8 L/min~~ .8
		0845		0.3			
		0850		0.3			
		0851		0.3			
		0852		0.3			
		0853		0.3			
		0854		0.4			
		0855		0.3			
	1/25/12	0856	34000562	N/A	-27	-8	
CWL-UI-1-80	1/25/12	0855	N/A	0.3	N/A	N/A	Flow = ~~0.8 L/min~~ .8
		0900		0.3			
		0905		0.3			
		0910		0.3			
		0915		0.4			
		0920		0.4			
		0921		0.5			
		0922		0.4			
		0923		0.4			
		0924		0.3			
		0925		0.3			
	1/25/12	0926	34000569	N/A	-28	-8	
CWL-UI-1-40	1/25/12	0930	N/A	0.3	N/A	N/A	Flow = ~~0.8~~ .8
		0935		0.4			
		0940		0.4			
		0945		0.4			
		0950		0.4			

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-UI-1-40	1/25/12	0955	N/A	0.4	N/A	N/A	
		0956		0.4			
		0957		0.4			
		0958		0.4			
		0959		0.3			
		1000		0.3			
		1001	34000574	N/A	-29	-8	
CWL-UI-2-136	1/25/12	1015	N/A	0.2	N/A	N/A	Flow = 8
		1020		0.3			
		1025		0.2			
		1030		0.2			
		1035		0.2			
		1040		0.2			
		1041		0.1			
		1042		0.2			
		1043		0.2			
		1044		0.2			
		1045		0.2			
		1046	34001071	N/A	-29	-8	
CWL-UI-2-76	1/25/12	1045	N/A	0.1	N/A	N/A	Flow = 8
		1050		0.1			
		1055		0.1			
		1100		0.1			
		1105		0.1			
		1110		0.0			
		1111		0.0			
		1112		0.1			
		1113		0.1			
		1114		0.1			

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-UI-2-76	4/25/12	1115	N/A	~~N/A~~ 0.0	N/A	N/A	
↓	4/25/12	1116	34000070	N/A	-29	-8	
CWL-UI-2-36	4/25/12	1115	N/A	0.0	N/A	N/A	Flow = 8
↓	↓	1120	↓	0.0	↓	↓	
		1125		0.0			
		1130		0.0			
		1135		0.0			
		1140		0.0			
		1141		0.0			
		1142		0.0			
		1143		0.0			
		1144		0.0			
		1145	↓	0.0	↓	↓	
		1146	34000137	N/A	-29	-8	SA
↓	↓	1146	34000308	N/A	-29	-8	DU

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D1-470	1/26/12	0830	N/A	0.0	N/A	N/A	Flow = 8
		0835		0.0			
		0840		0.0			
		0845		0.0			
		0850		0.0			
		0855		0.1			
		0856		0.1			
		0857		0.1			
		0858		0.2			
		0859		0.1			
		0900		0.1			
		0901	34000275	N/A	-29	-8	
CWL-D1-350	1/26/12	0900	N/A	0.1	N/A	N/A	Flow = 8
		0905		0.1			
		0910		0.1			
		0915		0.1			
		0920		0.1			
		0925		0.1			
		0926		0.1			
		0927		0.1			
		0928		0.1			
		0929		0.1			
		0930		0.1			
		0931	34000156	N/A	-29	-8	
CWL-D1-240	1/26/12	0930	N/A	0.0	N/A	N/A	Flow = 8
		0935		0.1			
		0940		0.1			
		0945		0.5			
		0950		0.2			

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D1-240	1/26/12	0955	N/A	0.1	N/A	N/A	
		0956		0.1			
		0957		0.1			
		0958		0.1			
		0959		0.1			
		1000		0.1			
		1001	34000439	N/A	-27	-8	
CWL-D1-160	1/26/12	1000	N/A	0.1	N/A	N/A	Flow= 8
		1005		0.3			
		1010		0.2			
		1015		0.1			
		1020		0.0			
		1025		0.1			
		1026		0.1			
		1027		0.1			
		1028		0.1			
		1029		0.1			
		1030		0.1			SV=-29 EV=-8
		1031	34000160	N/A	-29	-8	34000265-DU
CWL-D1-100	1/26/12	1030	N/A	0.0	N/A	N/A	Flow= 8
		1035		0.1			
		1040		0.1			
		1045		0.0			
		1050		0.1			
		1055		0.1			
		1057		0.1			
		1059		0.1			
		1100		0.1			
		1101	34000546	N/A	-29	-8	

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-DD-470	1/27/12	0800	N/A	0.2	N/A	N/A	Flow=9
↓	↓	0805	↓	0.1	↓	↓	
		0810		0.1			
		0815		0.1			
		0820		0.1			
		0825		0.1			
		0826		0.1			
		0827		0.1			
		0828		0.1			
		0829		0.1			
		0830	↓	0.1	↓	↓	
↓	↓	0831	34000393	N/A	-29	-6	
CWL-DD-440	1/27/12	0830	N/A	0.1	N/A	N/A	Flow=8
↓	↓	0835	↓	0.1	↓	↓	
		0840		0.1			
		0845		0.1			
		0850		0.2			
		0855		0.1			
		0856		0.1			
		0857		0.0			
		0858		0.0			
		0859		0.1			
		0900	↓	0.1	↓	↓	
↓	↓	0901	34001082	N/A	-29	-6	
CWL-DD-350	1/27/12	0900	N/A	0.0	N/A	N/A	Flow=8
↓	↓	0905	↓	0.1	↓	↓	
		0910		0.1			
		0915		0.0			
↓	↓	0920	↓	0.0	↓	↓	

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CwL-D2-350	1/27/12	0925	N/A	0.1	N/A	N/A	
		0926		0.0			
		0927		0.0			
		0928		0.0			
		0929		0.0			
		0930		0.0			
		0931	34000466	N/A	-28	-8	
CwL-D2-240	1/27/12	0930	N/A	0.0	N/A	N/A	Flow=8
		0935		0.1			
		0940		0.2			
		0945		0.1			
		0950		0.0			
		0955		0.1			
		0956		0.1			
		0957		0.1			
		0958		0.1			
		0959		0.1			
		1000		0.1			
		1001	34000575	N/A	-29	-8	
CwL-D2-120	1/27/12	1000	N/A	0.0	N/A	N/A	Flow=8
		1005		0.1			
		1010		0.0			
		1015		0.0			
		1020		0.0			
		1025		0.1			
		1027		0.1			
		1029		0.1			
		1030		0.1			
		1031	34000030	N/A	-	-	

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D3-480	1/30/12	0805	N/A	0.1	N/A	N/A	Flow = 8
↓	↓	0810	↓	0.1	↓	↓	
		0815		0.1			
		0820		0.1			
		0825		0.1			
		0830		0.1			
		0831		0.1			
		0832		0.1			
		0833		0.1			
		0834		0.1			
		0835	↓	0.1	↓	↓	SV = -25 EV = -8
↓	↓	0836	34000187	N/A	-27	-8	DU = 34000120
CWL-D3-440	1/30/12	0835	N/A	0.1	N/A	N/A	Flow = 8
↓	↓	0840	↓	0.1	↓	↓	
		0845		0.1			
		0850		0.0			Flow drop to < 3
		0855		0.0			
		0900		0.1			
		0901		0.0			
		0902		0.0			
		0903		0.0			
		0904		0.0			Flow = 0
		0905	↓	0.0	↓	↓	unable to pull
↓	↓	0906	34000181	N/A	-28	-28	MW3 sample
CWL-D-3-350	1/30/12	0905	N/A	0.0	N/A	N/A	Flow = 8
↓	↓	0910	↓	0.1	↓	↓	
		0915		0.0			
		0920		0.1			
↓	↓	0925	↓	0.0	↓	↓	

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D-3-350	1/30/12	0930	N/A	0.0	N/A	N/A	
		0931		0.0			
		0932		0.0			
		0933		0.1			
		0934		0.1			
		0935	↓	0.0	↓	↓	
↓	↓	0936	34000391	N/A	-28	-8	
CWL-D-3-170	1/30/12	0935	N/A	0.0	N/A	N/A	FLOW=8
		0940		0.1			
		0945		0.1			
		0950		0.0			
		0955		0.0			
		1000		0.0			
		1001		0.0			
		1002		0.0			
		1003		0.0			
		1004		0.0			
		1005	↓	0.0	↓	↓	
↓	↓	1006	34000557	N/A	-29	-26	
CWL-D-3-120	1/30/12	1005	N/A	0.0	N/A	N/A	FLOW=8
		1010		0.0			
		1015		0.0			
		1020		0.0			
		1025		0.0			
		1030		0.0			
		1032		0.0			
		1034		0.0			
		1035	↓	0.0	↓	↓	
↓	↓	1036	34000148	N/A	-29	-8	

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-D3 Date: 03/22/12 Time: 0808

Activities: Slug Test at Chemical Waste Landfill Groundwater Monitoring Wells
(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill ____ °F

Chemicals Used: ~~Acids in sample containers, standard solutions, Hach ACCU-VAC ampules~~
Other: Slug test

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.		☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.		☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.		☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.		☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.		☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.		☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.		☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Robert Lynch	Robert Lynch
ALFRED SANTILLANES	Alfred Santillanes
Tim Jackson	T. Jackson
William Gibson	William J. Gibson

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-D3-440 Date: 03/29/12 Time: 0820

Activities: ~~Slug Test at~~ Chemical Waste Landfill ~~Groundwater~~ Soil/Vapor Monitoring Wells

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Weather Conditions:
Temp: _____ °F Wind Speed: _____ MPH Humidity: _____ % Wind Chill _____ °F

Chemicals Used: ~~Acids in sample containers, standard solutions, Hach ACCU-VAC ampules~~
Other: _____

Safety Topics Presented

☒ Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	☒ Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
☒ Wear safety boots.	☒ Be aware of electrical hazards
☒ Use safe lifting practices. Wear leather gloves if necessary.	☒ Be aware of pressure hazards.
☒ Be aware of pinch points on pump cable reel and hydraulic tailgate lift.	☒ No eating or drinking at sampling counter.
☒ Be aware of chemical hazards.	☒ Be aware of biohazards (snakes, spiders, etc.)
☒ Wear nitrile or latex gloves when sampling.	☒ Wear communication device (cell phone, EOC pager).
☒ Wear chemical safety goggles.	☒ Avoid spilling purge / decon water.

Hospital/Clinic: Sandia Medical Clinic Phone: 844-0911/911

Attendees

Printed Name	Signature
Tim Jackson	T-Jackson
ALFRED SANTILLANES	Alfred Santillanes
Robert Lynch	Robert Lynch

SUMMA® Canister Log

Serial #	Date Received	Date Tested for Initial VAC	Initial VAC at 5400 ft (in. Hg)	Date Used	End VAC at 5400 ft (in. Hg)	Date Returned to SMO
34000469	03/21/12	03/22/12	-27	03/22/12	-8	

SUMMA® Canister Log completed by:

ALFRED SANTILLANES
Printed Name

Signature

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SUMMA® Canister Log

Serial #	Date Received	Date Tested for Initial VAC	Initial VAC at 5400 ft (in. Hg)	Date Used	End VAC at 5400 ft (in. Hg)	Date Returned to SMO
34000187	03/21/12	3/29/12	-24	3/29/12	-8	3/29/12
34000393	03/21/12	3/29/12	-28	3/29/12	-8	3/29/12

SUMMA® Canister Log completed by:

ALFRED SANTILLANES
Printed Name

Signature

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Soil Vapor Sampling Log

Background = 0,0 ppm

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D3-440	3/22/12	0857	34000469		-27	-8	Sample
CWL-D3-445	3/22/12	0850	N/A	0.0	N/A	N/A	Start Purge
		0850+		0,8			
		0851		0,9			
		0851+		0,7			
		0852		0,6			
		0852		0.5			
		0853		0,9			
		0854		0,2			
		0854+		0,6			
		0855		0,6			
		0856		0,6			
		0857		0,6			End Purge
		Mini RAE 2000					
		model #	PGM 7600				
		serial #	110-008537				

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Soil Vapor Sampling Log

BACKGROUND = 0.0 ppm

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D3-440	3/29/12	0840	34000393		-24	-8	SAMPLE
CWL-D3-440	3/29/12	0830	N/A	0.0	N/A	N/A	START PURGE
		~~0831~~		0.1			continuous Readings
		~~0832~~		0.1			
		~~0833~~		0.1			
		~~0834~~		0.1			
		~~0835~~		0.1			
		~~0836~~		0.1			
		~~0837~~		0.1			
		~~0838~~		0.1			
		0839		0.1			END PURGE
CWL-D3-FB1	3/29/12	0827	34000187	N/A	-24	-8	FIELD BLANK
			MINI-RAE 2000				
			MODEL NO.		PGM-7600		
			SERIAL NO.		110-008537		

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TAILGATE SAFETY BRIEFING

Facility: CWL Date: 5/7/12 Time: 1320

Activities: Soil vapor sampling

(Anyone has the right to cease field activities for safety concerns. The buddy system will be used when needed.)

Safety Topics Presented

☑ Wear safety glasses as needed	☑ Wear leather gloves when needed
☑ Wear safety boots	☑ Be aware of electrical hazards
☑ Wear hearing protection as needed	☑ Use safe lifting practices
☑ Be aware of biohazards (snakes, spiders, etc.)	☑ Be aware of slips, trips, and falls
☑ Perform appropriate inspections for equipment used	☑ Eating or drinking allowed in designated areas only
☑ Proper housekeeping will be maintained	☐
☐	☐

Does anyone have any weight restrictions on lifting? Circle **YES** or **NO**. If answered **YES** explain.

Presenter

Printed Name	Signature
Robert Lynch	Robert Lynch

Attendees

Printed Name	Signature
Tim Jackson	Tim Jackson
William Gibson	William Gibson
Alfred Santillanes	Alfred Santillanes

Notes

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SUMMA® Canister Log

Serial #	Date Received	Date Tested for Initial VAC	Initial VAC at 5400 ft (in. Hg)	Date Used	End VAC at 5400 ft (in. Hg)	Date Returned to SMO	
34001536	5/2/12	5/7/12	-26	5/7/12	-8	TJ FB 5/9/12	FB
34001447	↓	↓	-26	↓	-8	TJ SA	SA
34000046			-26		-8	TJ	DU
34001515			-26		-8		SA
34000597			-26		-8		FB

SUMMA® Canister Log completed by:

ALFRED SANTILLANES
Printed Name

Signature

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Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D3-480	5/7/12	13:45	n/a	0.0	n/a	n/a	continuous PID
↓	↓	↓	↓	↓	↓	↓	readings during Purge
		↓	↓	↓	↓	↓	↓
		13:48	34001447	n/a	-26	-8	sample
↓	↓	13:51	34000046	↓	-26	-8	Duplicate sample
CWL-VI-2-36	5/7/12	1406	n/a	0.0	n/a	n/a	continuous PID readings durin Purge
↓	↓	1407	34001515	↓	-26	-8	sample
↓	↓	1408	34000597	n/a	-26	-8	Duplicate sample

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SUMMARY SHEETS FOR CALENDAR YEAR 2012 SAMPLES

Sample Summary for CWL Soil Vapor Monitoring
Calendar Year 2012

Well ID	Sample Date	Sample ID / Port	*SUMMA Number*	ARCOC	Sample Number	Sample Type	Associated Equipment Blank (ARCOC #/Sample #)	Associated Trip Blank (ARCOC #/Sample #)	Associated Field Blank (ARCOC #/Sample #)	Comments
Chemical Waste Landfill Soil Vapor Monitoring: Project Task Number 146422.10.11.03 / Service Order Number CF 291-12										
CWL-UI1	25-Jan-12	**CWL-UI1-40**	34000574	613973	091655	Environmental	n/a	n/a	613979 / 091658	
		CWL-UI1-80	34000569		091656	Environmental				
		CWL-UI1-120	34000562		091657	Environmental				
		CWL-UI1-FB1	34000530		091658	Field QC	n/a	n/a	n/a	Ultra Pure N2
CWL-UI2	25-Jan-12	**CWL-UI2-36**	34000137	613974	091659	Environmental	n/a	n/a	613974 / 091663	
		CWL-UI2-36	34000308		091660	Duplicate				
		CWL-UI2-76	34000070		091661	Environmental				
		CWL-UI2-136	34001071		091662	Environmental				
		CWL-UI2-FB2	34000165		091663	Field QC	n/a	n/a	n/a	Ultra Pure N2
CWL-D1	26-Jan-12	**CWL-D1-100**	34000546	613975	091664	Environmental	n/a	n/a	613975 / 091670	
		CWL-D1-160	34000160		091665	Environmental				
		CWL-D1-160	34000265		091666	Duplicate				
		CWL-D1-240	34000439		091667	Environmental				
		CWL-D1-350	34000156		091668	Environmental				
		CWL-D1-470	34000275		091669	Environmental				
		CWL-D1-FB3	34000062		091670	Field QC	n/a	n/a	n/a	Ultra Pure N2
CWL-D2	27-Jan-12	**CWL-D2-120**	34000030	613976	091671	Environmental	n/a	n/a	613976 / 091676	
		CWL-D2-240	34000575		091672	Environmental				
		CWL-D2-350	34000466		091673	Environmental				
		CWL-D2-440	34001082		091674	Environmental				
		CWL-D2-470	34000393		091675	Environmental				
		CWL-D2-FB4	34000189		091676	Field QC	n/a	n/a	n/a	Ultra Pure N2
CWL-D3	30-Jan-12	**CWL-D3-120**	34000148	613977	091677	Environmental	n/a	n/a	613977 / 091683	
		CWL-D3-170	34000557		091678	Environmental				
		CWL-D3-350	34000391		091679	Environmental				
		CWL-D3-480	34000187		091681	Environmental				
		CWL-D3-480	34000122		091682	Duplicate				
		CWL-D3-FB5	34000392		091683	Field QC	n/a	n/a	n/a	Ultra Pure N2

Sample Summary for CWL Soil Vapor Monitoring at CWL-D3-440
Calendar Year 2012

Well ID	Sample Date	Sample ID / Port	*SUMMA Number*	ARCOC	Sample Number	Sample Type	Associated Field Blank (ARCOC #/Sample #)	Comments
Chemical Waste Landfill Soil Vapor Monitoring: Project Task Number 146422.10.11.03 / Service Order Number CF 291-12								
CWL-D3	22-Mar-12	**CWL-D3-440**	34000469	614050	091938	Verification	n/a	no validation required
	29-Mar-12	**CWL-D3-440**	34000393	614059	091962	Environmental	614059 / 091963	
	29-Mar-12	**CWL-D3-FB1**	34000187	614059	091963	Field QC	n/a	Field blank associated with 29-Mar-12 activities.

Sample Summary for CWL Soil Vapor Monitoring Resampling Event at CWL-UI-2 and CWL-D3
May 2012

Well ID	Sample Date	Sample ID / Port	*SUMMA Number*	ARCOC	Sample Number	Sample Type	Associated Field Blank (ARCOC #/Sample #)	Comments
Chemical Waste Landfill Soil Vapor Monitoring: Project Task Number 146422.10.11.03 / Service Order Number CF 291-12								
CWL-UI-2	07-May-12	**CWL-UI-2-36**	34001515	614190	092337	Environmental	614190 / 092341	
		CWL-UI-2-36	34000597		092338	Duplicate	614190 / 092341	
		CWL-FB1	34001536		092341	Field QC	n/a	
CWL-D3	07-May-12	**CWL-D3-480**	34001447		092339	Environmental	614190 / 092341	
		CWL-D3-480	34000046		092340	Duplicate	614190 / 092341	
		CWL-FB1	34001536		092341	Field QC	n/a	

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

AR/COC NUMBERS 613973, 613974, 613975, 613976, and 613977

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: March 13, 2012

To: File

From: Marcia Hilchey

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL SVM
AR/COC: 613973 through -977
SDG: 340-370-1
Laboratory: TestAmerica Costa Mesa CA
Project/Task: 14622.10.11.01
Analysis: VOCs by TO-14A

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 3.

Summary

Twenty-eight samples were prepared and analyzed with accepted procedures using method EPA TO-14A (VOCs in air). 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/Preservation

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as follows.

The calibration verification %Ds for chloromethane and 2-hexanone associated with several samples were >30% with positive bias. The associated sample results were NDs and will not be qualified for the calibration infraction.

Blanks

No target analytes were detected in the blanks.

Internal Standards

All internal standards met QC acceptance criteria.

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.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analyses were used as a measure laboratory precision.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Detection Limits/Dilutions

All detection limits were properly reported. Samples were diluted at various dilutions (1X to 155X) due to the nature of the matrix.

Other QC

FBs and field duplicate pairs were submitted on the AR/COC(s). There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 613973, 613974, 613975, 613976, 613977

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 613973 > -977 Site/Project: SWL Cal. SVM Validation Date: 3/13/12

SDG #: Job # 240-370-1 Laboratory: TA-Costa Mesa Validator: M. H. Ichey

Matrix: air # of Samples: 28 CVR present: yes Analysis Type: ☑ Organic ☐ Metals

AR/COC(s) present: yes Sample Container Integrity: OK - summa canisters ☐ Rad ☐ Gen Chem

Requested Analyses Not Reported

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
all reported						

Hold Time/Preservation Outliers

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
none								

Comments:

Revised 7/2007

Validated By:

Organic Worksheet (GC/MS)

AR/COC #: 613973 → -977 SDG #: Job # 340-370-1 Matrix: air

Laboratory Sample IDs: 340-370-1 → -28

Method/Batch #s: TO-14A 675/679/688 Tuning (pass/fail): pass TICs Required? (yes/no) no

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	MS/MSD LCSD RPD		FBs		
	Int.	RF	RSD/ R^2	CCV %D										
	✓	✓	✓		✓	n/a	✓		n/a	✓		✓		
chloromethane				31 [1]										
2-hexanone				33 [2]										

Surrogate Recovery Outliers n/a

Sample ID						

IS Outliers ✓

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
orc												
					RMH							

Comments: Ical: 3/13/12 MSA - 4/24/12 MSB

[1] applies to samples 1-4

[2] " " " 24-28

340-370

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. MA

SMO Use

AR/COC 613973

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	1/30/12	Project/Task No. 146422.10.11.03	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	135283	SMO Authorization: Don Watkins SMO	
Project Name:	CWL SVM	Lab Contact:	Sonia Tabirara 714-258-8610	Contract #: 691437	
Record Center Code:	ER/1306/DAT	Lab Destination:	Test America		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Wendy Palencia/505-844-3132		☑ Validation Required
Service Order No.	CFO# 291-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable) P.O. Box 5800 MS 0154 Albuquerque, NM 87185-0154
Location	Tech Area	Reference LOV(available at SMO)			
Building	Room				

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Canister ID	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
091655-001	CWL-UI1-40	34000574	N/A	01/25/12 1001	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091656-001	CWL-UI1-80	34000569	N/A	01/25/12 0926	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091657-001	CWL-UI1-120	34000562	N/A	01/25/12 0856	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091658-001	CWL-UI1-FB1	34000530	N/A	01/25/12 0909	UPN	SC	6 L	N/A	G	FB	VOC-TO14	

RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT 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:

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	SNL/4142/844-4013/250-7090
	Alfred Santillanes			SNL/4142/844-5130/228-0710
	William J. Gibson			SNL/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 1/30/12	Time 1107	4.Relinquished by		Org. 4143	Date 1/30/12	Time 1200
1. Received by		Org. 4143	Date 1/30/12	Time 1107	4. Received by		Org.	Date 2/2/12	Time 10:30
2.Relinquished by		Org. 4143	Date 1/30/12	Time 1200	5.Relinquished by		Org.	Date	Time
2. Received by		Org.	Date	Time	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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CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. MA

SMO Use

AR/COC 613974

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	1/30/12	Project/Task No. 146422.10.11.03	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	135283	SMO Authorization: SMO	
Project Name:	CWL SVM	Lab Contact:	Sonia Tabirara 714-258-8610	Contract #: 691437	
Record Center Code:		Lab Destination:	Test America		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Wendy Palencia/505-844-3132		☑ Validation Required
Service Order No.	CFO# 291-12	Send Report to SMO:			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	Canister ID	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
091659-001	CWL-UI2-36	34000137	N/A	01/25/12 1146	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091660-001	CWL-UI2-36	34000308	N/A	01/25/12 1146	SG	SC	6 L	N/A	G	DU	VOC-TO14	
091661-001	CWL-UI2-76	34000070	N/A	01/25/12 1116	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091662-001	CWL-UI2-136	34001071	N/A	01/25/12 1046	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091663-001	CWL-UI2-FB2	34000165	N/A	01/25/12 1055	UPN	SC	6 L	N/A	G	FB	VOC-TO14	

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RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT 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:

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	SNL/4142/844-4013/250-7090
	Alfred Santillanes		AS	SNL/4142/844-5130/228-0710
	William J. Gibson		WJG	SNL/4142/844-4013/239-7367

1.Relinquished by		Org. 4142	Date 1/30/12	Time 1107	4.Relinquished by	Org.	Date Time
1. Received by		Org. 4143	Date 1/30/12	Time 1107	4. Received by	Org.	Date Time
2.Relinquished by		Org. 4143	Date 1/30/12	Time 1200	5.Relinquished by	Org.	Date Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date 2/2/12 Time 10:30
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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CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. NA

SMO Use

AR/COC 613975

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	1/30/12	Project/Task No. 146422.10.11.03	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	135283	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	CWL SVM	Lab Contact:	Sonia Tabirara 714-258-8610	Contract #: 691437	
Record Center Code:		Lab Destination:	Test America		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Wendy Palencia/505-844-3132		☑ Validation Required
Service Order No.	CFO# 291-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	**Reference LOV(available at SMO)**			Albuquerque, NM 87185-0154

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Canister ID	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
091664-001	CWL-D1-100	34000546	N/A	01/26/12 1101	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091665-001	CWL-D1-160	34000160	N/A	01/26/12 1031	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091666-001	CWL-D1-160	34000265	N/A	01/26/12 1031	SG	SC	6 L	N/A	G	DU	VOC-TO14	
091667-001	CWL-D1-240	34000439	N/A	01/26/12 1001	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091668-001	CWL-D1-350	34000156	N/A	01/26/12 0931	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091669-001	CWL-D1-470	34000275	N/A	01/26/12 0901	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091670-001	CWL-D1-FB3	34000062	N/A	01/26/12 0940	UPN	SC	6 L	N/A	G	FB	VOC-TO14	

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RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT

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:

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

*Please list as separate report.

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch	Robert Lynch	RL	SNL/4142/844-4013/250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/844-5130/228-0710
	William J. Gibson	William J. Gibson	WJG	SNL/4142/844-4013/239-7367

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 1/30/12	Time 1107	4.Relinquished by		Org.	Date	Time
1. Received by	Robert Lynch	Org. 4143	Date 1/30/12	Time 1107	4. Received by		Org.	Date	Time
2.Relinquished by	Dan Williams	Org. 4143	Date 1/30/12	Time 1200	5.Relinquished by		Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by		Org.	Date 2/2/12	Time 10:30
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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CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. ML

SMO Use

AR/COC 613976

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	1/30/12	Project/Task No. 146422.10.11.03	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	135283	SMO Authorization:	-Send preliminary/copy report to:
Project Name:	CWL SVM	Lab Contact:	Sonia Tabirara 714-258-8610	Contract #: 691437	
Record Center Code:		Lab Destination:	Test America		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Wendy Palencia/505-844-3132		☑ Validation Required
Service Order No.	CFO# 291-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	**Reference LOV(available at SMO)**			Albuquerque, NM 87185-0154

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Canister ID	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
091671-001	CWL-D2-120	34000030	N/A	01/27/12 1031	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091672-001	CWL-D2-240	34000575	N/A	01/27/12 1001	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091673-001	CWL-D2-350	34000466	N/A	01/27/12 0931	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091674-001	CWL-D2-440	34001082	N/A	01/27/12 0901	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091675-001	CWL-D2-470	34000393	N/A	01/27/12 0831	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091676-001	CWL-D2-FB4	34000189	N/A	01/27/12 0944	UPN	SC	6 L	N/A	G	FB	VOC-TO14	

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RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ **Negotiated TAT** 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:**

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

Sample Team Members	Name	Signature	Init	Company/Organization/Phone/Cellular
	Robert Lynch		RL	SNL/4142/844-4013/250-7090
	Alfred Santillanes			SNL/4142/844-5130/228-0710
	William J. Gibson			SNL/4142/844-4013/239-7367
	Gilbert Quintana			SNL/4142/844-2507

1.Relinquished by		Org. 4142	Date 1/30/12	Time 1107	4.Relinquished by	Org.	Date Time
1. Received by		Org. 4142	Date 1/30/12	Time 1107	4. Received by	Org.	Date Time
2.Relinquished by		Org. 4143	Date 1/30/12	Time 1200	5.Relinquished by	Org.	Date Time
2. Received by		Org.	Date	Time	5. Received by	Org.	Date 2/2/12 Time 10:30
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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Col 1

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. NA

AR/COC 613977

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	1/30/12	Project/Task No. 146422.10.11.03	☐ Waste Characterization
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	135283	SMO Authorization: Don Watson	-Send preliminary/copy report to:
Project Name:	CWL SVM	Lab Contact:	Sonia Tabirara 714-258-8610	Contract #: 691437	
Record Center Code:		Lab Destination:	Test America CM		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Wendy Palencia/505-844-3132		☑ Validation Required
Service Order No.	CFO# 291-12	Send Report to SMO:			Bill To: Sandia National Labs (Accounts Payable)
Location	Tech Area				P.O. Box 5800 MS 0154
Building	Room	**Reference LOV(available at SMO)**			Albuquerque, NM 87185-0154

Sample No.-Fraction	ER Sample ID or Sample Location Detail	Canister ID	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
091677-001	CWL-D3-120	34000148	N/A	01/30/12 1036	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091678-001	CWL-D3-170	34000557	N/A	01/30/12 1006	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091679-001	CWL-D3-350	34000391	N/A	01/30/12 0936	SG	SC	6 L	N/A	G	SA	VOC-TO14	
~~091680-001~~	~~CWL-D3-440~~	~~34000181~~	~~N/A~~	~~01/30/12 0906~~	~~SG~~	~~SC~~	~~6 L~~	~~N/A~~	~~G~~	~~SA~~	~~VOC-TO14~~ NO SAMPLE	NA
091681-001	CWL-D3-480	34000187	N/A	01/30/12 0836	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091682-001	CWL-D3-480	34000122	N/A	01/30/12 0836	SG	SC	6 L	N/A	G	DU	VOC-TO14	
091683-001	CWL-D3-FB5	34000392	N/A	01/30/12 0942	UPN	SC	6 L	N/A	G	FB	VOC-TO14	

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RMMA	☐ Yes ☑ No Ref. No.	**Sample Tracking**	Smo Use
Sample Disposal	☐ Return to Client ☑ Disposal by lab	Date Entered(mm/dd/yy)	
Turnaround Time	☐ 7 Day ☐ 15 Day ☑ 30 Day	Entered by:	
Return Samples By:	☐ Negotiated TAT	QC inits.	

Special Instructions/QC Requirements

EDD ☑ Yes ☐ No

Level D Package ☐ Yes ☑ No

***Send report to:**

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

Sampling complete CWL Soil Vapor 2nd Qtr 2012

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	Robert Lynch	Robert Lynch	RL	SNL/4142/844-4013/250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/844-5130/228-0710
	William J. Gibson	William J. Gibson	WG	SNL/4142/844-4013/239-7367

1.Relinquished by	Alfred Santillanes	Org. 4147	Date 1/30/12	Time 1107	4.Relinquished by		Org.	Date	Time
1. Received by	Don Watson	Org. 4143	Date 1/30/12	Time 1107	4. Received by		Org.	Date	Time
2.Relinquished by	Don Watson	Org. 4143	Date 1/31/12	Time 1200	5.Relinquished by		Org.	Date	Time
2. Received by		Org.	Date	Time	5. Received by		Org.	Date 2/2/12	Time 10:30
3.Relinquished by		Org.	Date	Time	6.Relinquished by		Org.	Date	Time
3. Received by		Org.	Date	Time	6. Received by		Org.	Date	Time

AR/COC NUMBERS 614050/614059

Note: This AR/COC includes Number 614050 but only AR/COC 614059 results are included in the Section 5.2 Summary Tables of this report. AR/COC 614050 was a preliminary comparison sample and did not require data validation.

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: May 14, 2012

To: File

From: Marcia Hilchey

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL SVM
AR/COC: 614059
SDG: 340-1432 and -1751
Laboratory: TestAmerica Costa Mesa CA
Project/Task: 14622.10.11.01
Analysis: VOCs by TO-14A

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 3.

Summary

Two samples were prepared and analyzed with accepted procedures using method EPA TO-14A (VOCs in air). Problems were identified with the data package that result in the qualification of data.

1) The y-intercept value for benzyl chloride in SDG 340-1432 was positive and > 3X the MDL. All associated sample results were ND and will be qualified **"R, I5."**

It should be noted that the data package included data from COCs 614050 and 614059. Per client request, only data from 614059 were validated. It should be further noted that amended data were received and validated for this COC addressing reanalysis of both samples for target analyte benzyl chloride only. The validation of the original SDG (340-1432) and reanalysis SDG (340-1751) are included in this report.

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

Holding Times/Preservation

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria except as noted above in the Summary section and as follows.

The initial calibration RSD was > 30% for benzyl chloride in SDG -1751. The associated sample result was ND and there were no other calibration infractions for that analyte. Therefore, no sample data will be qualified.

The calibration verification %D for acetone in SDG -1432 was >30% with positive bias. The associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks with the following exception. Methylene chloride was detected in the FB at < PQL. The associated sample result was >5X the FB concentration and will not be qualified.

Internal Standards

All internal standards met QC acceptance criteria.

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.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analyses were used as a measure laboratory precision.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Detection Limits/Dilutions

All detection limits were properly reported. Samples were diluted at various dilutions due to the nature of the matrix.

Other QC

A FB was submitted on the AR/COC(s).

No other specific issues that affect data quality were identified.

Sample Findings Summary

AR/COC: 614059

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
TO_14A			
	091962-001/CWL-D3-440	BENZYL CHLORIDE (100-44-7)	R, I5
	091963-001/CWL-D3-FB1	BENZYL CHLORIDE (100-44-7)	R, I5

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 614050, -059 & 614050 -059 RR Site/Project: CWLSWM Validation Date: 5/14/12

SDG #: 340-1432 & -1751 Laboratory: TA-CM Validator: M. Hickey

Matrix: air # of Samples: 2 CVR present: yes Analysis Type: ☒ Organic ☐ Metals

AR/COC(s) present: yes Sample Container Integrity: OK ☐ Rad ☐ Gen Chem

Requested Analyses Not Reported none

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments
	34 MH					

Hold Time/Preservation Outliers none

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT
~~09-962-R-01~~	~~340-1751-2~~	TO-14a	✓	31 MH				

Comments: SOC -1432 all TAL except benzyl chloride

" " only

-1751

DV 614059 ok

Revised 7/2007

Validated By: [signature]

Organic Worksheet (GC/MS)

AR/COC #: 614050-059 + RR SDG #: 340-1432 + 1757 RR Matrix: GW

Laboratory Sample IDs: [1] 1432-1, -2 [2] 1751-1, -2

Method/Batch #s: TO 14a Tuning (pass/fail): pass SS TICs Required? (yes/no) no

Analyte (outliers)	Calibration: ~~Area~~ Int. ~~Area~~	Calibration: RF 0.05	Calibration: RSD/ R^2 30	Calibration: CCV %D	Method Blank	5X (10X) Blank	LCS %R	MS/ %R n/a	LCSD ~~MSD~~ %R	MS/ MSD RPD	FB			
methylene chloride	✓	✓	✓	✓	✓	10.5	✓		✓	✓	[1] 2.15			
benzyl chloride	-48 [1]	↓	31 [2]		↓		↓		↓	↓	↓			
acetone	✓	↓	✓	33.4 [1]	↓		↓		↓	↓	↓			

Surrogate Recovery Outliers n/a for TO-14a

Sample ID						

40% 5/20sc **IS Outliers** none

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT

Comments: 1432 - all ND except benzyl chloride

2 - 1471 " " only

340-1432

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No. N/A

4/2/12 3/29

AR/COC 614059

Dept. No./Mail Stop:	6234/0718	Date Samples Shipped:	3/29/12	Project/Task No. 146422.10.11.03	☐ Waste Characterization -Send preliminary/copy report to:
Project/Task Manager:	Mike Mitchell	Carrier/Waybill No.	138888	SMO Authorization:	
Project Name:	CWL SVM	Lab Contact:	Sonia Tabirara 714-258-8610	Contract #: 691437	
Record Center Code:		Lab Destination:	Test America (Costa Mesa)		☐ Released by COC No.:
Logbook Ref. No.:	NA	SMO Contact/Phone:	Wendy Palencia/505-844-3132		☑ Validation Required
Service Order No.	CFO# 291-12	Send Report to SMO:			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	Canister ID	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
091962-001	CWL-D3-440	34000393	N/A	03/29/12 0840	SG	SC	6 L	N/A	G	SA	VOC-TO14	
091963-001	CWL-D3-FB1	34000187	N/A	03/29/12 0827	SG	SC	6 L	N/A	G	FB	VOC-TO14	

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RMMA ☐ Yes ☑ No Ref. No.

Sample Disposal ☐ Return to Client ☑ Disposal by lab

Turnaround Time ☐ 7 Day ☐ 15 Day ☑ 30 Day

Return Samples By: ☐ Negotiated TAT 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:**

Tim Jackson/ORG. 4142/MS.0729/ 284-2547

Sampling complete for CWL SVM 2nd Qtr 2012

***Please list as separate report.**

Abnormal Conditions on Receipt

Lab Use

	Name	Signature	Init	Company/Organization/Phone/Cellular
Sample Team Members	Robert Lynch	Robert Lynch	RL	SNL/4142/844-4013/250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/844-5130/228-0710
	William J. Gibson	William J. Gibson	WJG	SNL/4142/844-4013/239-7367

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 3/29/12	Time 1000	4.Relinquished by		Org.	Date	Time
1. Received by	GSWI	Org. 4142	Date 3/29/12	Time 1000	4. Received by		Org.	Date	Time
2.Relinquished by	GSWI	Org. 4142	Date 4/2/12	Time 0630	5.Relinquished by		Org.	Date	Time
2. Received by		Org. TALA	Date 4/5/12	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

AR/COC NUMBER 614190

ANALYTICAL QUALITY ASSOCIATES, INC.

616 Maxine NE
Albuquerque, NM 87123
505-299-5201
www.aqainc.net

Memorandum

Date: June 23, 2012

To: File

From: Marcia Hilchey

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL SVM
AR/COC: 614190
SDG: 340-1983
Laboratory: TestAmerica Costa Mesa CA
Project/Task: 14622.10.11.03
Analysis: VOCs by TO-14A

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 3.

Summary

Five samples were prepared and analyzed with accepted procedures using method EPA TO-14A (VOCs in air). 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/Preservation

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

Instrument Tune

All instrument tune requirements were met.

Calibration

The initial calibration and continuing calibration data met QC acceptance criteria.

Blanks

No target analytes were detected in the blanks.

Internal Standards

All internal standards met QC acceptance criteria.

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.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

No MS/MSD analyses were required by this method. The LCSD analyses were used as a measure laboratory precision.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Detection Limits/Dilutions

All detection limits were properly reported. Samples were diluted at various dilutions due to the nature of the matrix.

Other QC

A FB was submitted on the AR/COC(s).

No other specific issues that affect data quality were identified.

Reviewed By: Ken Salaz **Date:** 06/25/12

Sample Findings Summary

AR/COC: 614190

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC

All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 614190 Site/Project: Cur SM Validation Date: 6/23/2

SDG #: 340-1983-1 Laboratory: TA-CM Validator: M. Hilton

Matrix: air # of Samples: 5 CVR present: yes Analysis Type: ☒ Organic ☐ Metals

AR/COC(s) present: yes Sample Container Integrity: OK ☐ Rad ☐ Gen Chem

Requested Analyses Not Reported none

Sample Number	Laboratory ID	organic	genchem	metals	rad	Comments

Hold Time/Preservation Outliers none

Sample Number	Laboratory ID	Analysis	Pres.	Coll. Date	Prep. Date	Anal. Date	Anal. within 2X HT	Anal. beyond 2X HT

Comments:

Revised 7/2007

Validated By:

Organic Worksheet (GC/MS) TO14a

AR/COC #: 614190 SDG #: 340-1923-1 Matrix: air

Laboratory Sample IDs: 340-1985-1 -7 -5

Method/Batch #s: TO-14a 15795 Tuning (pass/fail): pass TICs Required? (yes/no) no

Analyte (outliers)	Calibration				Method Blank	5X (10X) Blank	LCS %R	MS %R	MSD %R	~~MS/~~ MSD RPD	FS	LCSD RPD		
	Int. n/a	RF ✓	RSD/ R^2 ✓	CCV %D ✓	✓		✓		n/a		✓	✓		

Surrogate Recovery Outliers n/a for TO14a

Sample ID						

IS Outliers none

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT

Comments:

SMO 2012-ARCOC (4-2012)

AOP 95-16

CONTRACT LABORATORY
ANALYSIS REQUEST AND CHAIN OF CUSTODY

340-1983

Internal Lab

Batch No. NA

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AR/COC 614190

		SMO Use		
Project Name:	CWL SVM	Date Samples Shipped: 5/10/12	SMO Authorization: Jon Whitleyaft SMO	☐ Waste Characterization
Project/Task Manager:	Tim Jackson	Carrier/Waybill No. 140113	SMO Contact Phone: Sonia	☐ RMMA
Project/Task Number:	146422.10.11.03	Lab Contact: Sonia Tabirara/714-258-8610	Wendy Palencia/505-844-3132	☐ Released by COC No.
Service Order:	CF291-12	Lab Destination: Test America, Costa Mesa CA	Send Report to SMO:	☐ 4° Celsius
		Contract No.: PO 691437	Rita Kavanaugh/505-284-2553	Bill to:Sandia National Laboratories (Accounts Payable),
Tech Area:				P.O. Box 5800, MS-0154
Building:	Room:	Operational Site:		Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container Type	Container Volume	Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
092337	-001	CWL-UI-2-36	36	5/7/12 14:07	SG	SC	6L	na	G	SA	VOC - TO14	
092338	-001	CWL-UI-2-36	36	5/7/12 14:08	SG	SC	6L	na	G	DU	VOC - TO14	
092339	-001	CWL-D3-480	480	5/7/12 13:48	SG	SC	6L	na	G	SA	VOC - TO14	
092340	-001	CWL-D3-480	480	5/7/12 13:51	SG	SC	6L	na	G	DU	VOC - TO14	
092341	-001	CWL-FB1	na	5/7/12 13:40	SG	SC	6L	na	G	FB	VOC - TO14	

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		Sample Tracking (SMO Use)	Special Instructions/QC Requirements:	Conditions on Receipt
Last Chain:	☑ Yes	Date Entered:	EDD ☑ Yes ☐ No	
Validation Req'd:	☑ Yes	Entered by:	Turnaround Time ☐ 7 Day* ☐ 15 Day* ☑ 30 Day	
Background:	☐ Yes	QC Inits.:	Negotiated TAT ☐	
Confirmatory:	☐ Yes		Sample Disposal ☐ Return to Client ☑ Disposal by Lab	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell
	Robert Lynch	Robert Lynch	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	Alfred Santillanes	AS	SNL/4142/505-844-5130/505-228-0710
	Bill Gibson	William Z. Gibson	WZG	SNL/4142/505-284-3307/505-239-7367

Return Samples By:

Comments: Send report to Tim Jackson/4142/MS 0729/284-2547

Method reference: "Compendium Of Methods For The Determination of Toxic Organic Compounds in Ambient Air," Second Edition, EPA/625/R-96/010B, January 1999.

Lab Use

1.Relinquished by	Alfred Santillanes	Org. 4142	Date 5/9/12	Time 1420	3.Relinquished by	Org.	Date / Time
1. Received by	Dale Chavez	Org. 4142	Date 5/9/12	Time 1420	3. Received by	Org.	Date / Time
2.Relinquished by	Robert Lynch	Org. 4142	Date 5/10/12	Time 0700	4.Relinquished by	Org.	Date / Time
2. Received by		Org.	Date 5/15/12	Time 10:00	4. Received by	Org.	Date / Time

*Prior confirmation with SMO required for 7 and 15 day TAT

CONTRACT VERIFICATION REVIEW FORMS

Note: The review forms in this section include AR/COC numbers for environmental samples and additional AR/COC numbers for waste characterization samples.

AR/COC Number	Sample Type
613973	Environmental*
613974	Environmental*
613975	Environmental*
613976	Environmental*
613977	Environmental*
614050	Environmental*
614059	Environmental*
614190	Environmental*

* These AR/COC forms are provided in the Data Validation Section of this Annex.

Contract Verification Review (CVR)

Project Leader	JACKSON	Project Name	CWL SVM	Project/Task No.	146422_10.11.03
AR/COC No.	613973, 613974, 613975, 613976, 613977	Analytical Lab	TACA		340-370-1

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided	N/A				
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6 Contractual qualifiers provided: “J”- estimated quantity; “B”- analyte found in method blank above the MDL for organic and inorganic; “U”- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); “H”- analysis done beyond the holding time; “h” - analysis done beyond the extraction/preparation holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs 8081 and 8082.	N/A		

Contract Verification Review (Continued)

4.0 Calibrations and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668)			
a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		
f) RRTs for samples and standards provided	N/A		

g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	N/A		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Continued)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for all monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted	N/A		
5.3 Verification or reanalysis requested from lab	N/A		

Contract Verification Review (Concluded)

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes θ No

Based on the review, this data package is complete. θ Yes θ No

If no, provide: nonconformance report or correction request number _____ or date correction request was submitted: _____

Reviewed by: _____ Date: 3.1.2012 Closed by: _____ Date_____

Contract Verification Review (CVR)

Project Leader JACKSON | Project Name CWL SVM | Project/Task No. 146422_10.11.03

AR/COC No. 614050 & 614059 | Analytical Lab TEST AMERICA – CA | SDG No. 340-1432-1

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided	X				
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	X		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	METHYLENE CHLORIDE DETECTED IN FIELD BLANK
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs 8081 and 8082.	N/A		

Contract Verification Review (Continued)

4.0 Calibrations and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	N/A		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Continued)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for all monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted	N/A		
5.3 Verification or reanalysis requested from lab	N/A		

Contract Verification Review (Concluded)

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide: nonconformance report or correction request number _____ or date correction request was submitted: _____

Reviewed by: W. Palencia Date: 5.2.2012 Closed by: _____ Date _____

Contract Verification Review (CVR)

Project Leader JACKSON | Project Name CWL SVM | Project/Task No. 146422_10.11.03

AR/COC No. 614050 & 614059 | Analytical Lab TEST AMERICA – CA | SDG No. 340-11751-1

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided	X				
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6 Contractual qualifiers provided: "J"- estimated quantity; "B"- analyte found in method blank above the MDL for organic and inorganic; "U"- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); "H"- analysis done beyond the holding time; "h" - analysis done beyond the extraction/preparation holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs 8081 and 8082.	N/A		

Contract Verification Review (Continued)

4.0 Calibrations and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.) a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668) a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	N/A		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Continued)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for all monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted	N/A		
5.3 Verification or reanalysis requested from lab	N/A		

Contract Verification Review (Concluded)

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide: nonconformance report or correction request number _____ or date correction request was submitted: _____

Reviewed by: W. Palencia Date: 5.7.2012 Closed by: _____ Date_____

Contract Verification Review (CVR)

Project Leader JACKSON | Project Name CWL SVM | Project/Task No. 146422_10.11.03

AR/COC No. 614190 | Analytical Lab TEST AMERICA – CA | SDG No. 340-1983-1

In the tables below, mark any information that is missing or incorrect and give an explanation.

1.0 Analysis Request and Chain of Custody Record and Log-In Information

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
1.1	All items on COC complete - data entry clerk initialed and dated	X				
1.2	Container type(s) correct for analyses requested	X				
1.3	Sample volume adequate for # and types of analyses requested	X				
1.4	Preservative correct for analyses requested	X				
1.5	Custody records continuous and complete	X				
1.6	Lab sample number(s) provided and SNL sample number(s) cross referenced and correct	X				
1.7	Date samples received	X				
1.8	Condition upon receipt information provided	X				

2.0 Analytical Laboratory Report

Line No.	Item	Complete? Yes	Complete? No	If no, explain	Resolved? Yes	Resolved? No
2.1	Data reviewed, signature	X				
2.2	Method reference number(s) complete and correct	X				
2.3	QC analysis and acceptance limits provided (MB, LCS, Replicate)	X				
2.4	Matrix spike/matrix spike duplicate data provided	X				
2.5	Detection limits provided; PQL and MDL(or IDL), MDA and L_c	X				
2.6	QC batch numbers provided	X				
2.7	Dilution factors provided and all dilution levels reported	X				
2.8	Data reported in appropriate units and using correct significant figures	X				
2.9	Radiochemistry analysis uncertainty (2 sigma error) and tracer recovery (if applicable) reported	N/A				
2.10	Narrative provided	X				
2.11	TAT met	X				
2.12	Hold times met	X				
2.13	Contractual qualifiers provided	X				
2.14	All requested result and TIC (if requested) data provided	X				

Contract Verification Review (Continued)

3.0 Data Quality Evaluation

Item	Yes	No	If no, Sample ID No./Fraction(s) and Analysis
3.1 Are reporting units appropriate for the matrix and meet contract specified or project-specific requirements? Inorganics and metals reported as ppm (mg/liter or mg/Kg)? Tritium reported in picocuries per liter with percent moisture for soil samples? Units consistent between QC samples and sample data	X		
3.2 Quantitation limit met for all samples	X		
3.3 Accuracy a) Laboratory control samples accuracy reported and met for all samples	X		
b) Surrogate data reported and met for all organic samples analyzed by a gas chromatography technique	N/A		
c) Matrix spike recovery data reported and met	N/A		
3.4 Precision a) Replicate sample precision reported and met for all inorganic and radiochemistry samples	N/A		
b) Matrix spike duplicate RPD data reported and met for all organic samples	N/A		
3.5 Blank data a) Method or reagent blank data reported and met for all samples	X		
b) Sampling blank (e.g., field, trip, and equipment) data reported and met	X		
3.6 Contractual qualifiers provided: “J”- estimated quantity; “B”- analyte found in method blank above the MDL for organic and inorganic; “U”- analyte undetected (results are below the MDL, IDL, or MDA (radiochemical)); “H”- analysis done beyond the holding time; “h” - analysis done beyond the extraction/preparation holding time	X		
3.7 Narrative addresses planchet flaming for gross alpha/beta	N/A		
3.8 Narrative included, correct, and complete	X		
3.9 Second column confirmation data provided for methods 8330 (high explosives) and pesticides/PCBs 8081 and 8082.	N/A		

Contract Verification Review (Continued)

4.0 Calibrations and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260, 8270, etc.)			
a) 12-hour tune check provided	X		
b) Initial calibration provided	X		
c) Continuing calibration provided	X		
d) Internal standard performance data provided	X		
e) Instrument run logs provided	X		
4.2 GC/HPLC (8330, 8082, 9070A, and 8010)			
a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) Instrument run logs provided	N/A		
4.3 HRGC/HRMS (1668)			
a) 12-hour tune check provided	N/A		
b) Initial calibration provided	N/A		
c) Continuing calibration provided	N/A		
d) Internal standard performance data provided	N/A		
e) Labeled compound recovery data provided	N/A		

f) RRTs for samples and standards provided	N/A		
g) Ion abundance ratios for samples and standards provided	N/A		
h) Instrument run logs provided	N/A		
4.4 LC/MS/MS (6850) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) CRI provided	N/A		
d) Internal standard performance data provided	N/A		
e) Chlorine isotope ratios provided (perchlorate only)	N/A		
f) ICS provided (perchlorate only)	N/A		
4.5 Inorganics (metals) a) Initial calibration provided	N/A		
b) Continuing calibration provided	N/A		
c) ICP interference check sample data provided	N/A		
d) ICP serial dilution provided	N/A		
e) Instrument run logs provided	N/A		
4.6 Radiochemistry and General Chemistry a) Instrument run logs provided	N/A		

Contract Verification Review (Continued)

5.0 Data Anomaly Report

Item	Yes	No	Comments
5.1 DAR completed for all monitoring and surveillance sample data	N/A		
5.2 Problems or outliers noted	N/A		
5.3 Verification or reanalysis requested from lab	N/A		

Contract Verification Review (Concluded)

6.0 Problem Resolution

Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? θ Yes X No

Based on the review, this data package is complete. X Yes θ No

If no, provide: nonconformance report or correction request number _____ or date correction request was submitted: _____

Reviewed by: W. Palencia Date: 6.6.2012 Closed by: _____ Date_____

SOIL-GAS SAMPLING RESULTS
CERTIFICATES OF ANALYSIS

January 2012 – Soil-Gas Samples

March 2012 – Well D3 – 440 ft port Samples

May 2012 – Duplicate Samples

Note: Certificates of Analysis are provided on compact disc only, for printed copies of this report.

JANUARY 2012 SOIL-GAS SAMPLING RESULTS

CERTIFICATES OF ANALYSIS

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091655-001/CWL-UI1-40**

Lab Sample ID: 340-370-1 | Date Sampled: 01/25/2012 1001
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5994.D
Dilution:	38.666			Initial Weight/Volume:	30 mL
Analysis Date:	02/14/2012 0837			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		150	390
Benzene	ND		77	150
Benzyl chloride	ND		150	390
Bromodichloromethane	ND		77	150
Bromoform	ND		77	150
Bromomethane	ND		77	150
2-Butanone (MEK)	ND		150	390
Carbon disulfide	ND		77	390
Carbon tetrachloride	ND		150	390
Chlorobenzene	ND		77	150
Dibromochloromethane	ND		77	150
Chloroethane	ND		77	150
Chloroform	940		77	150
Chloromethane	ND		77	150
1,2-Dibromoethane (EDB)	ND		77	150
1,2-Dichlorobenzene	ND		77	150
1,3-Dichlorobenzene	ND		77	150
1,4-Dichlorobenzene	ND		77	150
Dichlorodifluoromethane	ND		77	150
1,1-Dichloroethane	ND		77	150
1,2-Dichloroethane	ND		77	150
cis-1,2-Dichloroethene	ND		77	150
trans-1,2-Dichloroethene	ND		77	150
1,1-Dichloroethene	250		77	150
1,2-Dichloropropane	ND		77	190
cis-1,3-Dichloropropene	ND		77	190
trans-1,3-Dichloropropene	ND		150	390
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		77	150
Ethylbenzene	ND		77	150
4-Ethyltoluene	ND		77	150
Hexachlorobutadiene	ND		77	150
2-Hexanone	ND		77	390
Methylene Chloride	ND		77	150
4-Methyl-2-pentanone (MIBK)	ND		77	390
Styrene	ND		77	150
1,1,2,2-Tetrachloroethane	ND		77	150
Tetrachloroethene	4200		77	150
Toluene	ND		77	150
1,2,4-Trichlorobenzene	ND		97	190
1,1,1-Trichloroethane	ND		77	150
1,1,2-Trichloroethane	ND		77	150
Trichloroethene	5200		77	150
Trichlorofluoromethane	240		77	150
1,1,2-Trichloro-1,2,2-trifluoroethane	930		77	150
1,2,4-Trimethylbenzene	ND		77	190
1,3,5-Trimethylbenzene	ND		77	150

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091655-001/CWL-UI1-40**

Lab Sample ID: 340-370-1
Client Matrix: Air

Date Sampled: 01/25/2012 1001
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5994.D
Dilution:	38.666			Initial Weight/Volume:	30 mL
Analysis Date:	02/14/2012 0837			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		150	390
Vinyl chloride	ND		77	150
m,p-Xylene	ND		77	150
o-Xylene	ND		77	150

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091656-001/CWL-UI1-80**

Lab Sample ID: 340-370-2 | Date Sampled: 01/25/2012 0926
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5995.D
Dilution:	53.55			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0918			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		210	540
Benzene	ND		110	210
Benzyl chloride	ND		210	540
Bromodichloromethane	ND		110	210
Bromoform	ND		110	210
Bromomethane	ND		110	210
2-Butanone (MEK)	ND		210	540
Carbon disulfide	ND		110	540
Carbon tetrachloride	ND		210	540
Chlorobenzene	ND		110	210
Dibromochloromethane	ND		110	210
Chloroethane	ND		110	210
Chloroform	670		110	210
Chloromethane	ND		110	210
1,2-Dibromoethane (EDB)	ND		110	210
1,2-Dichlorobenzene	ND		110	210
1,3-Dichlorobenzene	ND		110	210
1,4-Dichlorobenzene	ND		110	210
Dichlorodifluoromethane	ND		110	210
1,1-Dichloroethane	ND		110	210
1,2-Dichloroethane	ND		110	210
cis-1,2-Dichloroethene	ND		110	210
trans-1,2-Dichloroethene	ND		110	210
1,1-Dichloroethene	430		110	210
1,2-Dichloropropane	ND		110	270
cis-1,3-Dichloropropene	ND		110	270
trans-1,3-Dichloropropene	ND		210	540
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	210
Ethylbenzene	ND		110	210
4-Ethyltoluene	ND		110	210
Hexachlorobutadiene	ND		110	210
2-Hexanone	ND		110	540
Methylene Chloride	130	J	110	210
4-Methyl-2-pentanone (MIBK)	ND		110	540
Styrene	ND		110	210
1,1,2,2-Tetrachloroethane	ND		110	210
Tetrachloroethene	1200		110	210
Toluene	ND		110	210
1,2,4-Trichlorobenzene	ND		130	270
1,1,1-Trichloroethane	ND		110	210
1,1,2-Trichloroethane	ND		110	210
Trichloroethene	6500		110	210
Trichlorofluoromethane	250		110	210
1,1,2-Trichloro-1,2,2-trifluoroethane	1000		110	210
1,2,4-Trimethylbenzene	ND		110	270
1,3,5-Trimethylbenzene	ND		110	210

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091656-001/CWL-UI1-80**

Lab Sample ID: 340-370-2
Client Matrix: Air

Date Sampled: 01/25/2012 0926
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5995.D
Dilution:	53.55			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0918			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		210	540
Vinyl chloride	ND		110	210
m,p-Xylene	ND		110	210
o-Xylene	ND		110	210

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091657-001/CWL-UI1-120**

Lab Sample ID: 340-370-3 | Date Sampled: 01/25/2012 0856
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5996.D
Dilution:	56.75			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0952			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		230	570
Benzene	ND		110	230
Benzyl chloride	ND		230	570
Bromodichloromethane	ND		110	230
Bromoform	ND		110	230
Bromomethane	ND		110	230
2-Butanone (MEK)	ND		230	570
Carbon disulfide	ND		110	570
Carbon tetrachloride	ND		230	570
Chlorobenzene	ND		110	230
Dibromochloromethane	ND		110	230
Chloroethane	ND		110	230
Chloroform	480		110	230
Chloromethane	ND		110	230
1,2-Dibromoethane (EDB)	ND		110	230
1,2-Dichlorobenzene	ND		110	230
1,3-Dichlorobenzene	ND		110	230
1,4-Dichlorobenzene	ND		110	230
Dichlorodifluoromethane	ND		110	230
1,1-Dichloroethane	ND		110	230
1,2-Dichloroethane	ND		110	230
cis-1,2-Dichloroethene	ND		110	230
trans-1,2-Dichloroethene	ND		110	230
1,1-Dichloroethene	470		110	230
1,2-Dichloropropane	ND		110	280
cis-1,3-Dichloropropene	ND		110	280
trans-1,3-Dichloropropene	ND		230	570
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	230
Ethylbenzene	ND		110	230
4-Ethyltoluene	ND		110	230
Hexachlorobutadiene	ND		110	230
2-Hexanone	ND		110	570
Methylene Chloride	250		110	230
4-Methyl-2-pentanone (MIBK)	ND		110	570
Styrene	ND		110	230
1,1,2,2-Tetrachloroethane	ND		110	230
Tetrachloroethene	880		110	230
Toluene	ND		110	230
1,2,4-Trichlorobenzene	ND		140	280
1,1,1-Trichloroethane	ND		110	230
1,1,2-Trichloroethane	ND		110	230
Trichloroethene	7700		110	230
Trichlorofluoromethane	290		110	230
1,1,2-Trichloro-1,2,2-trifluoroethane	1000		110	230
1,2,4-Trimethylbenzene	ND		110	280
1,3,5-Trimethylbenzene	ND		110	230

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091657-001/CWL-UI1-120**

Lab Sample ID: 340-370-3

Client Matrix: Air

Date Sampled: 01/25/2012 0856

Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5996.D
Dilution:	56.75			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0952			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		230	570
Vinyl chloride	ND		110	230
m,p-Xylene	ND		110	230
o-Xylene	ND		110	230

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091658-001/CWL-UI1-FB1**

Lab Sample ID: 340-370-4
Client Matrix: Air

Date Sampled: 01/25/2012 0909
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5997.D
Dilution:	1.0			Initial Weight/Volume:	1221 mL
Analysis Date:	02/14/2012 1028			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	ND		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	ND		2.0	4.0
Trichlorofluoromethane	ND		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091658-001/CWL-UI1-FB1**

Lab Sample ID: 340-370-4
Client Matrix: Air

Date Sampled: 01/25/2012 0909
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-675	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5997.D
Dilution:	1.0			Initial Weight/Volume:	1221 mL
Analysis Date:	02/14/2012 1028			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091659-001/CWL-UI2-36**

Lab Sample ID: 340-370-5 | Date Sampled: 01/25/2012 1146
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4776.D
Dilution:	21.1			Initial Weight/Volume:	50 mL
Analysis Date:	02/14/2012 1108			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		84	210
Benzene	ND		42	84
Benzyl chloride	ND		84	210
Bromodichloromethane	ND		42	84
Bromoform	ND		42	84
Bromomethane	ND		42	84
2-Butanone (MEK)	ND		84	210
Carbon disulfide	ND		42	210
Carbon tetrachloride	ND		84	210
Chlorobenzene	ND		42	84
Dibromochloromethane	ND		42	84
Chloroethane	ND		42	84
Chloroform	550		42	84
Chloromethane	ND		42	84
1,2-Dibromoethane (EDB)	ND		42	84
1,2-Dichlorobenzene	ND		42	84
1,3-Dichlorobenzene	ND		42	84
1,4-Dichlorobenzene	ND		42	84
Dichlorodifluoromethane	ND		42	84
1,1-Dichloroethane	ND		42	84
1,2-Dichloroethane	ND		42	84
cis-1,2-Dichloroethene	ND		42	84
trans-1,2-Dichloroethene	ND		42	84
1,1-Dichloroethene	ND		42	84
1,2-Dichloropropane	ND		42	110
cis-1,3-Dichloropropene	ND		42	110
trans-1,3-Dichloropropene	ND		84	210
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		42	84
Ethylbenzene	ND		42	84
4-Ethyltoluene	ND		42	84
Hexachlorobutadiene	ND		42	84
2-Hexanone	ND		42	210
Methylene Chloride	ND		42	84
4-Methyl-2-pentanone (MIBK)	ND		42	210
Styrene	ND		42	84
1,1,2,2-Tetrachloroethane	ND		42	84
Tetrachloroethene	180		42	84
Toluene	ND		42	84
1,2,4-Trichlorobenzene	ND		53	110
1,1,1-Trichloroethane	ND		42	84
1,1,2-Trichloroethane	ND		42	84
Trichloroethene	3100		42	84
Trichlorofluoromethane	180		42	84
1,1,2-Trichloro-1,2,2-trifluoroethane	630		42	84
1,2,4-Trimethylbenzene	ND		42	110
1,3,5-Trimethylbenzene	ND		42	84

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091659-001/CWL-UI2-36**

Lab Sample ID: 340-370-5
Client Matrix: Air

Date Sampled: 01/25/2012 1146
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4776.D
Dilution:	21.1			Initial Weight/Volume:	50 mL
Analysis Date:	02/14/2012 1108			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		84	210
Vinyl chloride	ND		42	84
m,p-Xylene	ND		42	84
o-Xylene	ND		42	84

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091660-001/CWL-UI2-36**

Lab Sample ID: 340-370-6 | Date Sampled: 01/25/2012 1146
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4758.D
Dilution:	21.72			Initial Weight/Volume:	50 mL
Analysis Date:	02/13/2012 2223			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		87	220
Benzene	ND		43	87
Benzyl chloride	ND		87	220
Bromodichloromethane	ND		43	87
Bromoform	ND		43	87
Bromomethane	ND		43	87
2-Butanone (MEK)	ND		87	220
Carbon disulfide	ND		43	220
Carbon tetrachloride	ND		87	220
Chlorobenzene	ND		43	87
Dibromochloromethane	ND		43	87
Chloroethane	ND		43	87
Chloroform	510		43	87
Chloromethane	ND		43	87
1,2-Dibromoethane (EDB)	ND		43	87
1,2-Dichlorobenzene	ND		43	87
1,3-Dichlorobenzene	ND		43	87
1,4-Dichlorobenzene	ND		43	87
Dichlorodifluoromethane	ND		43	87
1,1-Dichloroethane	ND		43	87
1,2-Dichloroethane	ND		43	87
cis-1,2-Dichloroethene	ND		43	87
trans-1,2-Dichloroethene	ND		43	87
1,1-Dichloroethene	ND		43	87
1,2-Dichloropropane	ND		43	110
cis-1,3-Dichloropropene	ND		43	110
trans-1,3-Dichloropropene	ND		87	220
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		43	87
Ethylbenzene	ND		43	87
4-Ethyltoluene	ND		43	87
Hexachlorobutadiene	ND		43	87
2-Hexanone	ND		43	220
Methylene Chloride	ND		43	87
4-Methyl-2-pentanone (MIBK)	ND		43	220
Styrene	ND		43	87
1,1,2,2-Tetrachloroethane	ND		43	87
Tetrachloroethene	170		43	87
Toluene	ND		43	87
1,2,4-Trichlorobenzene	ND		54	110
1,1,1-Trichloroethane	ND		43	87
1,1,2-Trichloroethane	ND		43	87
Trichloroethene	3000		43	87
Trichlorofluoromethane	140		43	87
1,1,2-Trichloro-1,2,2-trifluoroethane	580		43	87
1,2,4-Trimethylbenzene	ND		43	110
1,3,5-Trimethylbenzene	ND		43	87

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091660-001/CWL-UI2-36**

Lab Sample ID: 340-370-6
Client Matrix: Air

Date Sampled: 01/25/2012 1146
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4758.D
Dilution:	21.72			Initial Weight/Volume:	50 mL
Analysis Date:	02/13/2012 2223			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		87	220
Vinyl chloride	ND		43	87
m,p-Xylene	ND		43	87
o-Xylene	ND		43	87

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091661-001/CWL-UI2-76**

Lab Sample ID: 340-370-7 | Date Sampled: 01/25/2012 1116
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4759.D
Dilution:	36.16			Initial Weight/Volume:	30 mL
Analysis Date:	02/13/2012 2305			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		140	360
Benzene	ND		72	140
Benzyl chloride	ND		140	360
Bromodichloromethane	ND		72	140
Bromoform	ND		72	140
Bromomethane	ND		72	140
2-Butanone (MEK)	ND		140	360
Carbon disulfide	ND		72	360
Carbon tetrachloride	ND		140	360
Chlorobenzene	ND		72	140
Dibromochloromethane	ND		72	140
Chloroethane	ND		72	140
Chloroform	780		72	140
Chloromethane	ND		72	140
1,2-Dibromoethane (EDB)	ND		72	140
1,2-Dichlorobenzene	ND		72	140
1,3-Dichlorobenzene	ND		72	140
1,4-Dichlorobenzene	ND		72	140
Dichlorodifluoromethane	ND		72	140
1,1-Dichloroethane	ND		72	140
1,2-Dichloroethane	ND		72	140
cis-1,2-Dichloroethene	ND		72	140
trans-1,2-Dichloroethene	ND		72	140
1,1-Dichloroethene	ND		72	140
1,2-Dichloropropane	ND		72	180
cis-1,3-Dichloropropene	ND		72	180
trans-1,3-Dichloropropene	ND		140	360
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		72	140
Ethylbenzene	ND		72	140
4-Ethyltoluene	ND		72	140
Hexachlorobutadiene	ND		72	140
2-Hexanone	ND		72	360
Methylene Chloride	ND		72	140
4-Methyl-2-pentanone (MIBK)	ND		72	360
Styrene	ND		72	140
1,1,2,2-Tetrachloroethane	ND		72	140
Tetrachloroethene	230		72	140
Toluene	ND		72	140
1,2,4-Trichlorobenzene	ND		90	180
1,1,1-Trichloroethane	ND		72	140
1,1,2-Trichloroethane	ND		72	140
Trichloroethene	5600		72	140
Trichlorofluoromethane	240		72	140
1,1,2-Trichloro-1,2,2-trifluoroethane	1000		72	140
1,2,4-Trimethylbenzene	ND		72	180
1,3,5-Trimethylbenzene	ND		72	140

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091661-001/CWL-UI2-76**

Lab Sample ID: 340-370-7
Client Matrix: Air

Date Sampled: 01/25/2012 1116
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4759.D
Dilution:	36.16			Initial Weight/Volume:	30 mL
Analysis Date:	02/13/2012 2305			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		140	360
Vinyl chloride	ND		72	140
m,p-Xylene	ND		72	140
o-Xylene	ND		72	140

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091662-001/CWL-UI2-136**

Lab Sample ID: 340-370-8 | Date Sampled: 01/25/2012 1046
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4760.D
Dilution:	53.98			Initial Weight/Volume:	20 mL
Analysis Date:	02/13/2012 2350			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		220	540
Benzene	ND		110	220
Benzyl chloride	ND		220	540
Bromodichloromethane	ND		110	220
Bromoform	ND		110	220
Bromomethane	ND		110	220
2-Butanone (MEK)	ND		220	540
Carbon disulfide	ND		110	540
Carbon tetrachloride	ND		220	540
Chlorobenzene	ND		110	220
Dibromochloromethane	ND		110	220
Chloroethane	ND		110	220
Chloroform	670		110	220
Chloromethane	ND		110	220
1,2-Dibromoethane (EDB)	ND		110	220
1,2-Dichlorobenzene	ND		110	220
1,3-Dichlorobenzene	ND		110	220
1,4-Dichlorobenzene	ND		110	220
Dichlorodifluoromethane	ND		110	220
1,1-Dichloroethane	ND		110	220
1,2-Dichloroethane	ND		110	220
cis-1,2-Dichloroethene	ND		110	220
trans-1,2-Dichloroethene	ND		110	220
1,1-Dichloroethene	270		110	220
1,2-Dichloropropane	130	J	110	270
cis-1,3-Dichloropropene	ND		110	270
trans-1,3-Dichloropropene	ND		220	540
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	220
Ethylbenzene	ND		110	220
4-Ethyltoluene	ND		110	220
Hexachlorobutadiene	ND		110	220
2-Hexanone	ND		110	540
Methylene Chloride	ND		110	220
4-Methyl-2-pentanone (MIBK)	ND		110	540
Styrene	ND		110	220
1,1,2,2-Tetrachloroethane	ND		110	220
Tetrachloroethene	280		110	220
Toluene	ND		110	220
1,2,4-Trichlorobenzene	ND		130	270
1,1,1-Trichloroethane	ND		110	220
1,1,2-Trichloroethane	ND		110	220
Trichloroethene	8500		110	220
Trichlorofluoromethane	300		110	220
1,1,2-Trichloro-1,2,2-trifluoroethane	1300		110	220
1,2,4-Trimethylbenzene	ND		110	270
1,3,5-Trimethylbenzene	ND		110	220

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091662-001/CWL-UI2-136**

Lab Sample ID: 340-370-8 | Date Sampled: 01/25/2012 1046
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4760.D
Dilution:	53.98			Initial Weight/Volume:	20 mL
Analysis Date:	02/13/2012 2350			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		220	540
Vinyl chloride	ND		110	220
m,p-Xylene	ND		110	220
o-Xylene	ND		110	220

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091663-001/CWL-UI2-FB2**

Lab Sample ID: 340-370-9 | Date Sampled: 01/25/2012 1055
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4761.D
Dilution:	1.0			Initial Weight/Volume:	1177 mL
Analysis Date:	02/14/2012 0033			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	ND		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	ND		2.0	4.0
Trichlorofluoromethane	ND		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091663-001/CWL-UI2-FB2**

Lab Sample ID: 340-370-9
Client Matrix: Air

Date Sampled: 01/25/2012 1055
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4761.D
Dilution:	1.0			Initial Weight/Volume:	1177 mL
Analysis Date:	02/14/2012 0033			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091664-001/CWL-D1-100**

Lab Sample ID: 340-370-10 | Date Sampled: 01/26/2012 1101
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4762.D
Dilution:	55.05			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0115			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		220	550
Benzene	ND		110	220
Benzyl chloride	ND		220	550
Bromodichloromethane	ND		110	220
Bromoform	ND		110	220
Bromomethane	ND		110	220
2-Butanone (MEK)	ND		220	550
Carbon disulfide	ND		110	550
Carbon tetrachloride	ND		220	550
Chlorobenzene	ND		110	220
Dibromochloromethane	ND		110	220
Chloroethane	ND		110	220
Chloroform	560		110	220
Chloromethane	ND		110	220
1,2-Dibromoethane (EDB)	ND		110	220
1,2-Dichlorobenzene	ND		110	220
1,3-Dichlorobenzene	ND		110	220
1,4-Dichlorobenzene	ND		110	220
Dichlorodifluoromethane	ND		110	220
1,1-Dichloroethane	ND		110	220
1,2-Dichloroethane	ND		110	220
cis-1,2-Dichloroethene	ND		110	220
trans-1,2-Dichloroethene	ND		110	220
1,1-Dichloroethene	480		110	220
1,2-Dichloropropane	ND		110	280
cis-1,3-Dichloropropene	ND		110	280
trans-1,3-Dichloropropene	ND		220	550
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	220
Ethylbenzene	ND		110	220
4-Ethyltoluene	ND		110	220
Hexachlorobutadiene	ND		110	220
2-Hexanone	ND		110	550
Methylene Chloride	ND		110	220
4-Methyl-2-pentanone (MIBK)	ND		110	550
Styrene	ND		110	220
1,1,2,2-Tetrachloroethane	ND		110	220
Tetrachloroethene	1200		110	220
Toluene	ND		110	220
1,2,4-Trichlorobenzene	ND		140	280
1,1,1-Trichloroethane	ND		110	220
1,1,2-Trichloroethane	ND		110	220
Trichloroethene	10000		110	220
Trichlorofluoromethane	300		110	220
1,1,2-Trichloro-1,2,2-trifluoroethane	1300		110	220
1,2,4-Trimethylbenzene	ND		110	280
1,3,5-Trimethylbenzene	ND		110	220

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091664-001/CWL-D1-100**

Lab Sample ID: 340-370-10 | Date Sampled: 01/26/2012 1101
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4762.D
Dilution:	55.05			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0115			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		220	550
Vinyl chloride	ND		110	220
m,p-Xylene	ND		110	220
o-Xylene	ND		110	220

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091665-001/CWL-D1-160**

Lab Sample ID: 340-370-11 | Date Sampled: 01/26/2012 1031
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4763.D
Dilution:	109.38			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0157			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		440	1100
Benzene	ND		220	440
Benzyl chloride	ND		440	1100
Bromodichloromethane	ND		220	440
Bromoform	ND		220	440
Bromomethane	ND		220	440
2-Butanone (MEK)	ND		440	1100
Carbon disulfide	ND		220	1100
Carbon tetrachloride	ND		440	1100
Chlorobenzene	ND		220	440
Dibromochloromethane	ND		220	440
Chloroethane	ND		220	440
Chloroform	530		220	440
Chloromethane	ND		220	440
1,2-Dibromoethane (EDB)	ND		220	440
1,2-Dichlorobenzene	ND		220	440
1,3-Dichlorobenzene	ND		220	440
1,4-Dichlorobenzene	ND		220	440
Dichlorodifluoromethane	ND		220	440
1,1-Dichloroethane	ND		220	440
1,2-Dichloroethane	ND		220	440
cis-1,2-Dichloroethene	ND		220	440
trans-1,2-Dichloroethene	ND		220	440
1,1-Dichloroethene	760		220	440
1,2-Dichloropropane	ND		220	550
cis-1,3-Dichloropropene	ND		220	550
trans-1,3-Dichloropropene	ND		440	1100
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		220	440
Ethylbenzene	ND		220	440
4-Ethyltoluene	ND		220	440
Hexachlorobutadiene	ND		220	440
2-Hexanone	ND		220	1100
Methylene Chloride	ND		220	440
4-Methyl-2-pentanone (MIBK)	ND		220	1100
Styrene	ND		220	440
1,1,2,2-Tetrachloroethane	ND		220	440
Tetrachloroethene	790		220	440
Toluene	ND		220	440
1,2,4-Trichlorobenzene	ND		270	550
1,1,1-Trichloroethane	ND		220	440
1,1,2-Trichloroethane	ND		220	440
Trichloroethene	14000		220	440
Trichlorofluoromethane	400	J	220	440
1,1,2-Trichloro-1,2,2-trifluoroethane	2000		220	440
1,2,4-Trimethylbenzene	ND		220	550
1,3,5-Trimethylbenzene	ND		220	440

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091665-001/CWL-D1-160**

Lab Sample ID: 340-370-11 | Date Sampled: 01/26/2012 1031
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4763.D
Dilution:	109.38			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0157			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		440	1100
Vinyl chloride	ND		220	440
m,p-Xylene	ND		220	440
o-Xylene	ND		220	440

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091666-001/CWL-D1-160**

Lab Sample ID: 340-370-12 | Date Sampled: 01/26/2012 1031
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4764.D
Dilution:	110.15			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0246			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		440	1100
Benzene	ND		220	440
Benzyl chloride	ND		440	1100
Bromodichloromethane	ND		220	440
Bromoform	ND		220	440
Bromomethane	ND		220	440
2-Butanone (MEK)	ND		440	1100
Carbon disulfide	ND		220	1100
Carbon tetrachloride	ND		440	1100
Chlorobenzene	ND		220	440
Dibromochloromethane	ND		220	440
Chloroethane	ND		220	440
Chloroform	490		220	440
Chloromethane	ND		220	440
1,2-Dibromoethane (EDB)	ND		220	440
1,2-Dichlorobenzene	ND		220	440
1,3-Dichlorobenzene	ND		220	440
1,4-Dichlorobenzene	ND		220	440
Dichlorodifluoromethane	ND		220	440
1,1-Dichloroethane	ND		220	440
1,2-Dichloroethane	ND		220	440
cis-1,2-Dichloroethene	ND		220	440
trans-1,2-Dichloroethene	ND		220	440
1,1-Dichloroethene	700		220	440
1,2-Dichloropropane	ND		220	550
cis-1,3-Dichloropropene	ND		220	550
trans-1,3-Dichloropropene	ND		440	1100
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		220	440
Ethylbenzene	ND		220	440
4-Ethyltoluene	ND		220	440
Hexachlorobutadiene	ND		220	440
2-Hexanone	ND		220	1100
Methylene Chloride	ND		220	440
4-Methyl-2-pentanone (MIBK)	ND		220	1100
Styrene	ND		220	440
1,1,2,2-Tetrachloroethane	ND		220	440
Tetrachloroethene	710		220	440
Toluene	ND		220	440
1,2,4-Trichlorobenzene	ND		280	550
1,1,1-Trichloroethane	ND		220	440
1,1,2-Trichloroethane	ND		220	440
Trichloroethene	14000		220	440
Trichlorofluoromethane	280	J	220	440
1,1,2-Trichloro-1,2,2-trifluoroethane	2000		220	440
1,2,4-Trimethylbenzene	ND		220	550
1,3,5-Trimethylbenzene	ND		220	440

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091666-001/CWL-D1-160**

Lab Sample ID: 340-370-12 | Date Sampled: 01/26/2012 1031
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4764.D
Dilution:	110.15			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0246			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		440	1100
Vinyl chloride	ND		220	440
m,p-Xylene	ND		220	440
o-Xylene	ND		220	440

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091667-001/CWL-D1-240**

Lab Sample ID: 340-370-13 | Date Sampled: 01/26/2012 1001
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4765.D
Dilution:	154.71			Initial Weight/Volume:	7 mL
Analysis Date:	02/14/2012 0327			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		620	1500
Benzene	ND		310	620
Benzyl chloride	ND		620	1500
Bromodichloromethane	ND		310	620
Bromoform	ND		310	620
Bromomethane	ND		310	620
2-Butanone (MEK)	ND		620	1500
Carbon disulfide	ND		310	1500
Carbon tetrachloride	ND		620	1500
Chlorobenzene	ND		310	620
Dibromochloromethane	ND		310	620
Chloroethane	ND		310	620
Chloroform	ND		310	620
Chloromethane	ND		310	620
1,2-Dibromoethane (EDB)	ND		310	620
1,2-Dichlorobenzene	ND		310	620
1,3-Dichlorobenzene	ND		310	620
1,4-Dichlorobenzene	ND		310	620
Dichlorodifluoromethane	ND		310	620
1,1-Dichloroethane	ND		310	620
1,2-Dichloroethane	ND		310	620
cis-1,2-Dichloroethene	ND		310	620
trans-1,2-Dichloroethene	ND		310	620
1,1-Dichloroethene	ND		310	620
1,2-Dichloropropane	ND		310	770
cis-1,3-Dichloropropene	ND		310	770
trans-1,3-Dichloropropene	ND		620	1500
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		310	620
Ethylbenzene	ND		310	620
4-Ethyltoluene	ND		310	620
Hexachlorobutadiene	ND		310	620
2-Hexanone	ND		310	1500
Methylene Chloride	ND		310	620
4-Methyl-2-pentanone (MIBK)	ND		310	1500
Styrene	ND		310	620
1,1,2,2-Tetrachloroethane	ND		310	620
Tetrachloroethene	460	J	310	620
Toluene	ND		310	620
1,2,4-Trichlorobenzene	ND		390	770
1,1,1-Trichloroethane	ND		310	620
1,1,2-Trichloroethane	ND		310	620
Trichloroethene	22000		310	620
Trichlorofluoromethane	ND		310	620
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		310	620
1,2,4-Trimethylbenzene	ND		310	770
1,3,5-Trimethylbenzene	ND		310	620

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091667-001/CWL-D1-240**

Lab Sample ID: 340-370-13
Client Matrix: Air

Date Sampled: 01/26/2012 1001
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4765.D
Dilution:	154.71			Initial Weight/Volume:	7 mL
Analysis Date:	02/14/2012 0327			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		620	1500
Vinyl chloride	ND		310	620
m,p-Xylene	ND		310	620
o-Xylene	ND		310	620

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091668-001/CWL-D1-350**

Lab Sample ID: 340-370-14 | Date Sampled: 01/26/2012 0931
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4766.D
Dilution:	70.6			Initial Weight/Volume:	15 mL
Analysis Date:	02/14/2012 0411			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		280	710
Benzene	ND		140	280
Benzyl chloride	ND		280	710
Bromodichloromethane	ND		140	280
Bromoform	ND		140	280
Bromomethane	ND		140	280
2-Butanone (MEK)	ND		280	710
Carbon disulfide	ND		140	710
Carbon tetrachloride	ND		280	710
Chlorobenzene	ND		140	280
Dibromochloromethane	ND		140	280
Chloroethane	ND		140	280
Chloroform	ND		140	280
Chloromethane	ND		140	280
1,2-Dibromoethane (EDB)	ND		140	280
1,2-Dichlorobenzene	ND		140	280
1,3-Dichlorobenzene	ND		140	280
1,4-Dichlorobenzene	ND		140	280
Dichlorodifluoromethane	ND		140	280
1,1-Dichloroethane	ND		140	280
1,2-Dichloroethane	ND		140	280
cis-1,2-Dichloroethene	ND		140	280
trans-1,2-Dichloroethene	ND		140	280
1,1-Dichloroethene	900		140	280
1,2-Dichloropropane	ND		140	350
cis-1,3-Dichloropropene	ND		140	350
trans-1,3-Dichloropropene	ND		280	710
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		140	280
Ethylbenzene	ND		140	280
4-Ethyltoluene	ND		140	280
Hexachlorobutadiene	ND		140	280
2-Hexanone	ND		140	710
Methylene Chloride	ND		140	280
4-Methyl-2-pentanone (MIBK)	ND		140	710
Styrene	ND		140	280
1,1,2,2-Tetrachloroethane	ND		140	280
Tetrachloroethene	ND		140	280
Toluene	ND		140	280
1,2,4-Trichlorobenzene	ND		180	350
1,1,1-Trichloroethane	ND		140	280
1,1,2-Trichloroethane	ND		140	280
Trichloroethene	13000		140	280
Trichlorofluoromethane	460		140	280
1,1,2-Trichloro-1,2,2-trifluoroethane	2200		140	280
1,2,4-Trimethylbenzene	ND		140	350
1,3,5-Trimethylbenzene	ND		140	280

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091668-001/CWL-D1-350**

Lab Sample ID: 340-370-14
Client Matrix: Air

Date Sampled: 01/26/2012 0931
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4766.D
Dilution:	70.6			Initial Weight/Volume:	15 mL
Analysis Date:	02/14/2012 0411			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		280	710
Vinyl chloride	ND		140	280
m,p-Xylene	ND		140	280
o-Xylene	ND		140	280

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091669-001/CWL-D1-470**

Lab Sample ID: 340-370-15 | Date Sampled: 01/26/2012 0901
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4767.D
Dilution:	3.122			Initial Weight/Volume:	350 mL
Analysis Date:	02/14/2012 0454			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		12	31
Benzene	ND		6.2	12
Benzyl chloride	ND		12	31
Bromodichloromethane	ND		6.2	12
Bromoform	ND		6.2	12
Bromomethane	ND		6.2	12
2-Butanone (MEK)	ND		12	31
Carbon disulfide	ND		6.2	31
Carbon tetrachloride	ND		12	31
Chlorobenzene	ND		6.2	12
Dibromochloromethane	ND		6.2	12
Chloroethane	ND		6.2	12
Chloroform	ND		6.2	12
Chloromethane	ND		6.2	12
1,2-Dibromoethane (EDB)	ND		6.2	12
1,2-Dichlorobenzene	ND		6.2	12
1,3-Dichlorobenzene	ND		6.2	12
1,4-Dichlorobenzene	ND		6.2	12
Dichlorodifluoromethane	10	J	6.2	12
1,1-Dichloroethane	ND		6.2	12
1,2-Dichloroethane	ND		6.2	12
cis-1,2-Dichloroethene	ND		6.2	12
trans-1,2-Dichloroethene	ND		6.2	12
1,1-Dichloroethene	55		6.2	12
1,2-Dichloropropane	ND		6.2	16
cis-1,3-Dichloropropene	ND		6.2	16
trans-1,3-Dichloropropene	ND		12	31
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		6.2	12
Ethylbenzene	ND		6.2	12
4-Ethyltoluene	ND		6.2	12
Hexachlorobutadiene	ND		6.2	12
2-Hexanone	ND		6.2	31
Methylene Chloride	12		6.2	12
4-Methyl-2-pentanone (MIBK)	ND		6.2	31
Styrene	ND		6.2	12
1,1,2,2-Tetrachloroethane	ND		6.2	12
Tetrachloroethene	10	J	6.2	12
Toluene	ND		6.2	12
1,2,4-Trichlorobenzene	ND		7.8	16
1,1,1-Trichloroethane	ND		6.2	12
1,1,2-Trichloroethane	ND		6.2	12
Trichloroethene	510		6.2	12
Trichlorofluoromethane	51		6.2	12
1,1,2-Trichloro-1,2,2-trifluoroethane	220		6.2	12
1,2,4-Trimethylbenzene	ND		6.2	16
1,3,5-Trimethylbenzene	ND		6.2	12

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091669-001/CWL-D1-470**

Lab Sample ID: 340-370-15 | Date Sampled: 01/26/2012 0901
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4767.D
Dilution:	3.122			Initial Weight/Volume:	350 mL
Analysis Date:	02/14/2012 0454			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		12	31
Vinyl chloride	ND		6.2	12
m,p-Xylene	ND		6.2	12
o-Xylene	ND		6.2	12

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091670-001/CWL-D1-FB3**

Lab Sample ID: 340-370-16
Client Matrix: Air

Date Sampled: 01/26/2012 0940
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4777.D
Dilution:	1.0			Initial Weight/Volume:	1324 mL
Analysis Date:	02/14/2012 1153			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	ND		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	ND		2.0	4.0
Trichlorofluoromethane	ND		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091670-001/CWL-D1-FB3**

Lab Sample ID: 340-370-16
Client Matrix: Air

Date Sampled: 01/26/2012 0940
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4777.D
Dilution:	1.0			Initial Weight/Volume:	1324 mL
Analysis Date:	02/14/2012 1153			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091671-001/CWL-D2-120**

Lab Sample ID: 340-370-17 | Date Sampled: 01/27/2012 1031
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4769.D
Dilution:	118.44			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0620			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		470	1200
Benzene	ND		240	470
Benzyl chloride	ND		470	1200
Bromodichloromethane	ND		240	470
Bromoform	ND		240	470
Bromomethane	ND		240	470
2-Butanone (MEK)	ND		470	1200
Carbon disulfide	ND		240	1200
Carbon tetrachloride	ND		470	1200
Chlorobenzene	ND		240	470
Dibromochloromethane	ND		240	470
Chloroethane	ND		240	470
Chloroform	550		240	470
Chloromethane	ND		240	470
1,2-Dibromoethane (EDB)	ND		240	470
1,2-Dichlorobenzene	ND		240	470
1,3-Dichlorobenzene	ND		240	470
1,4-Dichlorobenzene	ND		240	470
Dichlorodifluoromethane	ND		240	470
1,1-Dichloroethane	ND		240	470
1,2-Dichloroethane	ND		240	470
cis-1,2-Dichloroethene	ND		240	470
trans-1,2-Dichloroethene	ND		240	470
1,1-Dichloroethene	840		240	470
1,2-Dichloropropane	ND		240	590
cis-1,3-Dichloropropene	ND		240	590
trans-1,3-Dichloropropene	ND		470	1200
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		240	470
Ethylbenzene	ND		240	470
4-Ethyltoluene	ND		240	470
Hexachlorobutadiene	ND		240	470
2-Hexanone	ND		240	1200
Methylene Chloride	ND		240	470
4-Methyl-2-pentanone (MIBK)	ND		240	1200
Styrene	ND		240	470
1,1,2,2-Tetrachloroethane	ND		240	470
Tetrachloroethene	540		240	470
Toluene	ND		240	470
1,2,4-Trichlorobenzene	ND		300	590
1,1,1-Trichloroethane	ND		240	470
1,1,2-Trichloroethane	ND		240	470
Trichloroethene	16000		240	470
Trichlorofluoromethane	470		240	470
1,1,2-Trichloro-1,2,2-trifluoroethane	2300		240	470
1,2,4-Trimethylbenzene	ND		240	590
1,3,5-Trimethylbenzene	ND		240	470

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091671-001/CWL-D2-120**

Lab Sample ID: 340-370-17
Client Matrix: Air

Date Sampled: 01/27/2012 1031
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4769.D
Dilution:	118.44			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0620			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		470	1200
Vinyl chloride	ND		240	470
m,p-Xylene	ND		240	470
o-Xylene	ND		240	470

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091672-001/CWL-D2-240**

Lab Sample ID: 340-370-18 | Date Sampled: 01/27/2012 1001
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4770.D
Dilution:	132.5			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0702			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		530	1300
Benzene	ND		270	530
Benzyl chloride	ND		530	1300
Bromodichloromethane	ND		270	530
Bromoform	ND		270	530
Bromomethane	ND		270	530
2-Butanone (MEK)	ND		530	1300
Carbon disulfide	ND		270	1300
Carbon tetrachloride	ND		530	1300
Chlorobenzene	ND		270	530
Dibromochloromethane	ND		270	530
Chloroethane	ND		270	530
Chloroform	470	J	270	530
Chloromethane	ND		270	530
1,2-Dibromoethane (EDB)	ND		270	530
1,2-Dichlorobenzene	ND		270	530
1,3-Dichlorobenzene	ND		270	530
1,4-Dichlorobenzene	ND		270	530
Dichlorodifluoromethane	ND		270	530
1,1-Dichloroethane	ND		270	530
1,2-Dichloroethane	ND		270	530
cis-1,2-Dichloroethene	ND		270	530
trans-1,2-Dichloroethene	ND		270	530
1,1-Dichloroethene	950		270	530
1,2-Dichloropropane	ND		270	660
cis-1,3-Dichloropropene	ND		270	660
trans-1,3-Dichloropropene	ND		530	1300
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		270	530
Ethylbenzene	ND		270	530
4-Ethyltoluene	ND		270	530
Hexachlorobutadiene	ND		270	530
2-Hexanone	ND		270	1300
Methylene Chloride	ND		270	530
4-Methyl-2-pentanone (MIBK)	ND		270	1300
Styrene	ND		270	530
1,1,2,2-Tetrachloroethane	ND		270	530
Tetrachloroethene	470	J	270	530
Toluene	ND		270	530
1,2,4-Trichlorobenzene	ND		330	660
1,1,1-Trichloroethane	ND		270	530
1,1,2-Trichloroethane	ND		270	530
Trichloroethene	18000		270	530
Trichlorofluoromethane	510	J	270	530
1,1,2-Trichloro-1,2,2-trifluoroethane	2500		270	530
1,2,4-Trimethylbenzene	ND		270	660
1,3,5-Trimethylbenzene	ND		270	530

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091672-001/CWL-D2-240**

Lab Sample ID: 340-370-18

Client Matrix: Air

Date Sampled: 01/27/2012 1001

Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4770.D
Dilution:	132.5			Initial Weight/Volume:	10 mL
Analysis Date:	02/14/2012 0702			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		530	1300
Vinyl chloride	ND		270	530
m,p-Xylene	ND		270	530
o-Xylene	ND		270	530

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091673-001/CWL-D2-350**

Lab Sample ID: 340-370-19 | Date Sampled: 01/27/2012 0931
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4771.D
Dilution:	62.91			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0744			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		250	630
Benzene	ND		130	250
Benzyl chloride	ND		250	630
Bromodichloromethane	ND		130	250
Bromoform	ND		130	250
Bromomethane	ND		130	250
2-Butanone (MEK)	ND		250	630
Carbon disulfide	ND		130	630
Carbon tetrachloride	ND		250	630
Chlorobenzene	ND		130	250
Dibromochloromethane	ND		130	250
Chloroethane	ND		130	250
Chloroform	220	J	130	250
Chloromethane	ND		130	250
1,2-Dibromoethane (EDB)	ND		130	250
1,2-Dichlorobenzene	ND		130	250
1,3-Dichlorobenzene	ND		130	250
1,4-Dichlorobenzene	ND		130	250
Dichlorodifluoromethane	ND		130	250
1,1-Dichloroethane	ND		130	250
1,2-Dichloroethane	ND		130	250
cis-1,2-Dichloroethene	ND		130	250
trans-1,2-Dichloroethene	ND		130	250
1,1-Dichloroethene	260		130	250
1,2-Dichloropropane	ND		130	310
cis-1,3-Dichloropropene	ND		130	310
trans-1,3-Dichloropropene	ND		250	630
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	250
Ethylbenzene	ND		130	250
4-Ethyltoluene	ND		130	250
Hexachlorobutadiene	ND		130	250
2-Hexanone	ND		130	630
Methylene Chloride	130	J	130	250
4-Methyl-2-pentanone (MIBK)	ND		130	630
Styrene	ND		130	250
1,1,2,2-Tetrachloroethane	ND		130	250
Tetrachloroethene	ND		130	250
Toluene	ND		130	250
1,2,4-Trichlorobenzene	ND		160	310
1,1,1-Trichloroethane	ND		130	250
1,1,2-Trichloroethane	ND		130	250
Trichloroethene	11000		130	250
Trichlorofluoromethane	ND		130	250
1,1,2-Trichloro-1,2,2-trifluoroethane	1700		130	250
1,2,4-Trimethylbenzene	ND		130	310
1,3,5-Trimethylbenzene	ND		130	250

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091673-001/CWL-D2-350**

Lab Sample ID: 340-370-19 | Date Sampled: 01/27/2012 0931
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4771.D
Dilution:	62.91			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 0744			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		250	630
Vinyl chloride	ND		130	250
m,p-Xylene	ND		130	250
o-Xylene	ND		130	250

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091674-001/CWL-D2-440**

Lab Sample ID: 340-370-20 | Date Sampled: 01/27/2012 0901
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4772.D
Dilution:	10.88			Initial Weight/Volume:	100 mL
Analysis Date:	02/14/2012 0826			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		44	110
Benzene	ND		22	44
Benzyl chloride	ND		44	110
Bromodichloromethane	ND		22	44
Bromoform	ND		22	44
Bromomethane	ND		22	44
2-Butanone (MEK)	ND		44	110
Carbon disulfide	ND		22	110
Carbon tetrachloride	ND		44	110
Chlorobenzene	ND		22	44
Dibromochloromethane	ND		22	44
Chloroethane	ND		22	44
Chloroform	ND		22	44
Chloromethane	ND		22	44
1,2-Dibromoethane (EDB)	ND		22	44
1,2-Dichlorobenzene	ND		22	44
1,3-Dichlorobenzene	ND		22	44
1,4-Dichlorobenzene	ND		22	44
Dichlorodifluoromethane	24	J	22	44
1,1-Dichloroethane	ND		22	44
1,2-Dichloroethane	ND		22	44
cis-1,2-Dichloroethene	ND		22	44
trans-1,2-Dichloroethene	ND		22	44
1,1-Dichloroethene	170		22	44
1,2-Dichloropropane	ND		22	54
cis-1,3-Dichloropropene	ND		22	54
trans-1,3-Dichloropropene	ND		44	110
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		22	44
Ethylbenzene	ND		22	44
4-Ethyltoluene	ND		22	44
Hexachlorobutadiene	ND		22	44
2-Hexanone	ND		22	110
Methylene Chloride	ND		22	44
4-Methyl-2-pentanone (MIBK)	ND		22	110
Styrene	ND		22	44
1,1,2,2-Tetrachloroethane	ND		22	44
Tetrachloroethene	52		22	44
Toluene	ND		22	44
1,2,4-Trichlorobenzene	ND		27	54
1,1,1-Trichloroethane	ND		22	44
1,1,2-Trichloroethane	ND		22	44
Trichloroethene	1800		22	44
Trichlorofluoromethane	ND		22	44
1,1,2-Trichloro-1,2,2-trifluoroethane	550		22	44
1,2,4-Trimethylbenzene	ND		22	54
1,3,5-Trimethylbenzene	ND		22	44

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091674-001/CWL-D2-440**

Lab Sample ID: 340-370-20 | Date Sampled: 01/27/2012 0901
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4772.D
Dilution:	10.88			Initial Weight/Volume:	100 mL
Analysis Date:	02/14/2012 0826			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		44	110
Vinyl chloride	ND		22	44
m,p-Xylene	ND		22	44
o-Xylene	ND		22	44

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091675-001/CWL-D2-470**

Lab Sample ID: 340-370-21 | Date Sampled: 01/27/2012 0831
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4773.D
Dilution:	7.56			Initial Weight/Volume:	140 mL
Analysis Date:	02/14/2012 0908			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		30	76
Benzene	ND		15	30
Benzyl chloride	ND		30	76
Bromodichloromethane	ND		15	30
Bromoform	ND		15	30
Bromomethane	ND		15	30
2-Butanone (MEK)	ND		30	76
Carbon disulfide	ND		15	76
Carbon tetrachloride	ND		30	76
Chlorobenzene	ND		15	30
Dibromochloromethane	ND		15	30
Chloroethane	ND		15	30
Chloroform	170		15	30
Chloromethane	ND		15	30
1,2-Dibromoethane (EDB)	ND		15	30
1,2-Dichlorobenzene	ND		15	30
1,3-Dichlorobenzene	ND		15	30
1,4-Dichlorobenzene	ND		15	30
Dichlorodifluoromethane	30		15	30
1,1-Dichloroethane	ND		15	30
1,2-Dichloroethane	ND		15	30
cis-1,2-Dichloroethene	ND		15	30
trans-1,2-Dichloroethene	ND		15	30
1,1-Dichloroethene	290		15	30
1,2-Dichloropropane	44		15	38
cis-1,3-Dichloropropene	ND		15	38
trans-1,3-Dichloropropene	ND		30	76
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		15	30
Ethylbenzene	ND		15	30
4-Ethyltoluene	ND		15	30
Hexachlorobutadiene	ND		15	30
2-Hexanone	ND		15	76
Methylene Chloride	ND		15	30
4-Methyl-2-pentanone (MIBK)	ND		15	76
Styrene	ND		15	30
1,1,2,2-Tetrachloroethane	ND		15	30
Tetrachloroethene	190		15	30
Toluene	ND		15	30
1,2,4-Trichlorobenzene	ND		19	38
1,1,1-Trichloroethane	ND		15	30
1,1,2-Trichloroethane	ND		15	30
Trichlorofluoromethane	190		15	30
1,1,2-Trichloro-1,2,2-trifluoroethane	770		15	30
1,2,4-Trimethylbenzene	ND		15	38
1,3,5-Trimethylbenzene	ND		15	30
Vinyl acetate	ND		30	76

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091675-001/CWL-D2-470**

Lab Sample ID: 340-370-21 | Date Sampled: 01/27/2012 0831
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4773.D
Dilution:	7.56			Initial Weight/Volume:	140 mL
Analysis Date:	02/14/2012 0908			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl chloride	ND		15	30
m,p-Xylene	ND		15	30
o-Xylene	ND		15	30

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091675-001/CWL-D2-470**

Lab Sample ID: 340-370-21
Client Matrix: Air

Date Sampled: 01/27/2012 0831
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-693	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4778.D
Dilution:	42.34			Initial Weight/Volume:	25 mL
Analysis Date:	02/14/2012 1749			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Trichloroethene	4100		85	170

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091676-001/CWL-D2-FB4**

Lab Sample ID: 340-370-22
Client Matrix: Air

Date Sampled: 01/27/2012 0944
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4774.D
Dilution:	1.0			Initial Weight/Volume:	11189 mL
Analysis Date:	02/14/2012 0950			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	ND		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	ND		2.0	4.0
Trichlorofluoromethane	ND		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091676-001/CWL-D2-FB4**

Lab Sample ID: 340-370-22
Client Matrix: Air

Date Sampled: 01/27/2012 0944
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4774.D
Dilution:	1.0			Initial Weight/Volume:	11189 mL
Analysis Date:	02/14/2012 0950			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091677-001/CWL-D3-120**

Lab Sample ID: 340-370-23 | Date Sampled: 01/30/2012 1036
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4775.D
Dilution:	41.75			Initial Weight/Volume:	30 mL
Analysis Date:	02/14/2012 1029			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		170	420
Benzene	ND		84	170
Benzyl chloride	ND		170	420
Bromodichloromethane	ND		84	170
Bromoform	ND		84	170
Bromomethane	ND		84	170
2-Butanone (MEK)	ND		170	420
Carbon disulfide	ND		84	420
Carbon tetrachloride	ND		170	420
Chlorobenzene	ND		84	170
Dibromochloromethane	ND		84	170
Chloroethane	ND		84	170
Chloroform	190		84	170
Chloromethane	ND		84	170
1,2-Dibromoethane (EDB)	ND		84	170
1,2-Dichlorobenzene	ND		84	170
1,3-Dichlorobenzene	ND		84	170
1,4-Dichlorobenzene	ND		84	170
Dichlorodifluoromethane	ND		84	170
1,1-Dichloroethane	ND		84	170
1,2-Dichloroethane	ND		84	170
cis-1,2-Dichloroethene	ND		84	170
trans-1,2-Dichloroethene	ND		84	170
1,1-Dichloroethene	370		84	170
1,2-Dichloropropane	ND		84	210
cis-1,3-Dichloropropene	ND		84	210
trans-1,3-Dichloropropene	ND		170	420
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		84	170
Ethylbenzene	ND		84	170
4-Ethyltoluene	ND		84	170
Hexachlorobutadiene	ND		84	170
2-Hexanone	ND		84	420
Methylene Chloride	ND		84	170
4-Methyl-2-pentanone (MIBK)	ND		84	420
Styrene	ND		84	170
1,1,2,2-Tetrachloroethane	ND		84	170
Tetrachloroethene	170		84	170
Toluene	ND		84	170
1,2,4-Trichlorobenzene	ND		100	210
1,1,1-Trichloroethane	ND		84	170
1,1,2-Trichloroethane	ND		84	170
Trichloroethene	7000		84	170
Trichlorofluoromethane	260		84	170
1,1,2-Trichloro-1,2,2-trifluoroethane	1200		84	170
1,2,4-Trimethylbenzene	ND		84	210
1,3,5-Trimethylbenzene	ND		84	170

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091677-001/CWL-D3-120**

Lab Sample ID: 340-370-23
Client Matrix: Air

Date Sampled: 01/30/2012 1036
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-679	Instrument ID:	MSA
	N/A	Prep Batch:	N/A	Lab File ID:	A4775.D
Dilution:	41.75			Initial Weight/Volume:	30 mL
Analysis Date:	02/14/2012 1029			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	1 uL

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		170	420
Vinyl chloride	ND		84	170
m,p-Xylene	ND		84	170
o-Xylene	ND		84	170

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091678-001/CWL-D3-170**

Lab Sample ID: 340-370-24 | Date Sampled: 01/30/2012 1006
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5998.D
Dilution:	54.55			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 1913			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		220	550
Benzene	ND		110	220
Benzyl chloride	ND		220	550
Bromodichloromethane	ND		110	220
Bromoform	ND		110	220
Bromomethane	ND		110	220
2-Butanone (MEK)	ND		220	550
Carbon disulfide	ND		110	550
Carbon tetrachloride	ND		220	550
Chlorobenzene	ND		110	220
Dibromochloromethane	ND		110	220
Chloroethane	ND		110	220
Chloroform	220		110	220
Chloromethane	ND		110	220
1,2-Dibromoethane (EDB)	ND		110	220
1,2-Dichlorobenzene	ND		110	220
1,3-Dichlorobenzene	ND		110	220
1,4-Dichlorobenzene	ND		110	220
Dichlorodifluoromethane	ND		110	220
1,1-Dichloroethane	ND		110	220
1,2-Dichloroethane	ND		110	220
cis-1,2-Dichloroethene	ND		110	220
trans-1,2-Dichloroethene	ND		110	220
1,1-Dichloroethene	480		110	220
1,2-Dichloropropane	150	J	110	270
cis-1,3-Dichloropropene	ND		110	270
trans-1,3-Dichloropropene	ND		220	550
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		110	220
Ethylbenzene	ND		110	220
4-Ethyltoluene	ND		110	220
Hexachlorobutadiene	ND		110	220
2-Hexanone	ND		110	550
Methylene Chloride	ND		110	220
4-Methyl-2-pentanone (MIBK)	ND		110	550
Styrene	ND		110	220
1,1,2,2-Tetrachloroethane	ND		110	220
Tetrachloroethene	180	J	110	220
Toluene	ND		110	220
1,2,4-Trichlorobenzene	ND		140	270
1,1,1-Trichloroethane	ND		110	220
1,1,2-Trichloroethane	ND		110	220
Trichloroethene	7900		110	220
Trichlorofluoromethane	340		110	220
1,1,2-Trichloro-1,2,2-trifluoroethane	1300		110	220
1,2,4-Trimethylbenzene	ND		110	270
1,3,5-Trimethylbenzene	ND		110	220

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091678-001/CWL-D3-170**

Lab Sample ID: 340-370-24 | Date Sampled: 01/30/2012 1006
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5998.D
Dilution:	54.55			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 1913			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		220	550
Vinyl chloride	ND		110	220
m,p-Xylene	ND		110	220
o-Xylene	ND		110	220

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091679-001/CWL-D3-350**

Lab Sample ID: 340-370-25 | Date Sampled: 01/30/2012 0936
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5999.D
Dilution:	62.1			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 1955			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		250	620
Benzene	ND		120	250
Benzyl chloride	ND		250	620
Bromodichloromethane	ND		120	250
Bromoform	ND		120	250
Bromomethane	ND		120	250
2-Butanone (MEK)	ND		250	620
Carbon disulfide	ND		120	620
Carbon tetrachloride	ND		250	620
Chlorobenzene	ND		120	250
Dibromochloromethane	ND		120	250
Chloroethane	ND		120	250
Chloroform	200	J	120	250
Chloromethane	ND		120	250
1,2-Dibromoethane (EDB)	ND		120	250
1,2-Dichlorobenzene	ND		120	250
1,3-Dichlorobenzene	ND		120	250
1,4-Dichlorobenzene	ND		120	250
Dichlorodifluoromethane	ND		120	250
1,1-Dichloroethane	ND		120	250
1,2-Dichloroethane	ND		120	250
cis-1,2-Dichloroethene	ND		120	250
trans-1,2-Dichloroethene	ND		120	250
1,1-Dichloroethene	590		120	250
1,2-Dichloropropane	180	J	120	310
cis-1,3-Dichloropropene	ND		120	310
trans-1,3-Dichloropropene	ND		250	620
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		120	250
Ethylbenzene	ND		120	250
4-Ethyltoluene	ND		120	250
Hexachlorobutadiene	ND		120	250
2-Hexanone	ND		120	620
Methylene Chloride	960		120	250
4-Methyl-2-pentanone (MIBK)	ND		120	620
Styrene	ND		120	250
1,1,2,2-Tetrachloroethane	ND		120	250
Tetrachloroethene	190	J	120	250
Toluene	ND		120	250
1,2,4-Trichlorobenzene	ND		160	310
1,1,1-Trichloroethane	ND		120	250
1,1,2-Trichloroethane	ND		120	250
Trichloroethene	8800		120	250
Trichlorofluoromethane	380		120	250
1,1,2-Trichloro-1,2,2-trifluoroethane	1600		120	250
1,2,4-Trimethylbenzene	ND		120	310
1,3,5-Trimethylbenzene	ND		120	250

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091679-001/CWL-D3-350**

Lab Sample ID: 340-370-25 | Date Sampled: 01/30/2012 0936
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B5999.D
Dilution:	62.1			Initial Weight/Volume:	20 mL
Analysis Date:	02/14/2012 1955			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		250	620
Vinyl chloride	ND		120	250
m,p-Xylene	ND		120	250
o-Xylene	ND		120	250

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091681-001/CWL-D3-480**

Lab Sample ID: 340-370-26 | Date Sampled: 01/30/2012 0836
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6000.D
Dilution:	1.3466			Initial Weight/Volume:	900 mL
Analysis Date:	02/14/2012 2036			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	10	J	5.4	13
Benzene	ND		2.7	5.4
Benzyl chloride	ND		5.4	13
Bromodichloromethane	ND		2.7	5.4
Bromoform	ND		2.7	5.4
Bromomethane	ND		2.7	5.4
2-Butanone (MEK)	ND		5.4	13
Carbon disulfide	ND		2.7	13
Carbon tetrachloride	ND		5.4	13
Chlorobenzene	ND		2.7	5.4
Dibromochloromethane	ND		2.7	5.4
Chloroethane	ND		2.7	5.4
Chloroform	13		2.7	5.4
Chloromethane	ND		2.7	5.4
1,2-Dibromoethane (EDB)	ND		2.7	5.4
1,2-Dichlorobenzene	ND		2.7	5.4
1,3-Dichlorobenzene	ND		2.7	5.4
1,4-Dichlorobenzene	ND		2.7	5.4
Dichlorodifluoromethane	ND		2.7	5.4
1,1-Dichloroethane	ND		2.7	5.4
1,2-Dichloroethane	ND		2.7	5.4
cis-1,2-Dichloroethene	ND		2.7	5.4
trans-1,2-Dichloroethene	ND		2.7	5.4
1,1-Dichloroethene	13		2.7	5.4
1,2-Dichloropropane	3.0	J	2.7	6.7
cis-1,3-Dichloropropene	ND		2.7	6.7
trans-1,3-Dichloropropene	ND		5.4	13
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.7	5.4
Ethylbenzene	ND		2.7	5.4
4-Ethyltoluene	ND		2.7	5.4
Hexachlorobutadiene	ND		2.7	5.4
2-Hexanone	ND		2.7	13
Methylene Chloride	3.6	J	2.7	5.4
4-Methyl-2-pentanone (MIBK)	ND		2.7	13
Styrene	ND		2.7	5.4
1,1,2,2-Tetrachloroethane	ND		2.7	5.4
Tetrachloroethene	ND		2.7	5.4
Toluene	ND		2.7	5.4
1,2,4-Trichlorobenzene	ND		3.4	6.7
1,1,1-Trichloroethane	ND		2.7	5.4
1,1,2-Trichloroethane	ND		2.7	5.4
Trichloroethene	210		2.7	5.4
Trichlorofluoromethane	11		2.7	5.4
1,1,2-Trichloro-1,2,2-trifluoroethane	35		2.7	5.4
1,2,4-Trimethylbenzene	ND		2.7	6.7
1,3,5-Trimethylbenzene	ND		2.7	5.4

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091681-001/CWL-D3-480**

Lab Sample ID: 340-370-26

Client Matrix: Air

Date Sampled: 01/30/2012 0836

Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6000.D
Dilution:	1.3466			Initial Weight/Volume:	900 mL
Analysis Date:	02/14/2012 2036			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		5.4	13
Vinyl chloride	ND		2.7	5.4
m,p-Xylene	ND		2.7	5.4
o-Xylene	ND		2.7	5.4

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091682-001/CWL-D3-480**

Lab Sample ID: 340-370-27 | Date Sampled: 01/30/2012 0836
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6001.D
Dilution:	1.0			Initial Weight/Volume:	942 mL
Analysis Date:	02/14/2012 2117			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	27		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	5.6		2.0	4.0
Chloroform	8.7		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	8.6		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	4.5		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	4.3		2.0	4.0
Toluene	82		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	130		2.0	4.0
Trichlorofluoromethane	7.3		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	24		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091682-001/CWL-D3-480**

Lab Sample ID: 340-370-27

Client Matrix: Air

Date Sampled: 01/30/2012 0836

Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6001.D
Dilution:	1.0			Initial Weight/Volume:	942 mL
Analysis Date:	02/14/2012 2117			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	2.5	J	2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-370-1

Client Sample ID: **091683-001/CWL-D3-FB5**

Lab Sample ID: 340-370-28
Client Matrix: Air

Date Sampled: 01/30/2012 0942
Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6002.D
Dilution:	1.0			Initial Weight/Volume:	1185 mL
Analysis Date:	02/14/2012 2159			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	ND		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	ND		2.0	4.0
Trichlorofluoromethane	ND		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories | Job Number: 340-370-1

Client Sample ID: **091683-001/CWL-D3-FB5**

Lab Sample ID: 340-370-28 | Date Sampled: 01/30/2012 0942
Client Matrix: Air | Date Received: 02/02/2012 1030

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-688	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6002.D
Dilution:	1.0			Initial Weight/Volume:	1185 mL
Analysis Date:	02/14/2012 2159			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

MARCH 2012 SOIL-GAS SAMPLING RESULTS

CERTIFICATES OF ANALYSIS

CWL Well D3
440-foot sampling port

Client: Sandia National Laboratories | Job Number: 340-1432-1

Client Sample ID: **091962-001/CWL-D3-440**

Lab Sample ID: 340-1432-1 | Date Sampled: 03/29/2012 0840
Client Matrix: Air | Date Received: 04/05/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1317	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6647.D
Dilution:	48.4			Initial Weight/Volume:	25 mL
Analysis Date:	04/14/2012 0218			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		190	480
Benzene	ND		97	190
Benzyl chloride	ND		190	480
Bromodichloromethane	ND		97	190
Bromoform	ND		97	190
Bromomethane	ND		97	190
2-Butanone (MEK)	ND		190	480
Carbon disulfide	ND		97	480
Carbon tetrachloride	ND		190	480
Chlorobenzene	ND		97	190
Dibromochloromethane	ND		97	190
Chloroethane	ND		97	190
Chloroform	150	J	97	190
Chloromethane	ND		97	190
1,2-Dibromoethane (EDB)	ND		97	190
1,2-Dichlorobenzene	ND		97	190
1,3-Dichlorobenzene	ND		97	190
1,4-Dichlorobenzene	ND		97	190
Dichlorodifluoromethane	ND		97	190
1,1-Dichloroethane	ND		97	190
1,2-Dichloroethane	ND		97	190
cis-1,2-Dichloroethene	ND		97	190
trans-1,2-Dichloroethene	ND		97	190
1,1-Dichloroethene	370		97	190
1,2-Dichloropropane	ND		97	240
cis-1,3-Dichloropropene	ND		97	240
trans-1,3-Dichloropropene	ND		190	480
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		97	190
Ethylbenzene	ND		97	190
4-Ethyltoluene	ND		97	190
Hexachlorobutadiene	ND		97	190
2-Hexanone	ND		97	480
Methylene Chloride	780		97	190
4-Methyl-2-pentanone (MIBK)	ND		97	480
Styrene	ND		97	190
1,1,2,2-Tetrachloroethane	ND		97	190
Tetrachloroethene	170	J	97	190
Toluene	ND		97	190
1,2,4-Trichlorobenzene	ND		120	240
1,1,1-Trichloroethane	ND		97	190
1,1,2-Trichloroethane	ND		97	190
Trichloroethene	6800		97	190
Trichlorofluoromethane	320		97	190
1,1,2-Trichloro-1,2,2-trifluoroethane	1100		97	190
1,2,4-Trimethylbenzene	ND		97	240
1,3,5-Trimethylbenzene	ND		97	190

Client: Sandia National Laboratories

Job Number: 340-1432-1

Client Sample ID: **091962-001/CWL-D3-440**

Lab Sample ID: 340-1432-1
Client Matrix: Air

Date Sampled: 03/29/2012 0840
Date Received: 04/05/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1317	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6647.D
Dilution:	48.4			Initial Weight/Volume:	25 mL
Analysis Date:	04/14/2012 0218			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		190	480
Vinyl chloride	ND		97	190
m,p-Xylene	ND		97	190
o-Xylene	ND		97	190

Client: Sandia National Laboratories

Job Number: 340-1432-1

Client Sample ID: **091963-001/CWL-D3-FB1**

Lab Sample ID: 340-1432-2
Client Matrix: Air

Date Sampled: 03/29/2012 0827
Date Received: 04/05/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1317	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6648.D
Dilution:	1.0			Initial Weight/Volume:	1147 mL
Analysis Date:	04/14/2012 0301			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	ND		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	2.1	J	2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	ND		2.0	4.0
Trichlorofluoromethane	ND		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-1432-1

Client Sample ID: **091963-001/CWL-D3-FB1**

Lab Sample ID: 340-1432-2
Client Matrix: Air

Date Sampled: 03/29/2012 0827
Date Received: 04/05/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1317	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6648.D
Dilution:	1.0			Initial Weight/Volume:	1147 mL
Analysis Date:	04/14/2012 0301			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories Job Number: 340-1751-1

Client Sample ID: **091962-R01 / CWL-D3-440**

Lab Sample ID: 340-1751-2 Date Sampled: 03/29/2012 0840
Client Matrix: Air Date Received: 04/05/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1423	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6783.D
Dilution:	48.4			Initial Weight/Volume:	20 mL
Analysis Date:	04/26/2012 0329			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Benzyl chloride	ND	cn	190	480

Client: Sandia National Laboratories Job Number: 340-1751-1

Client Sample ID: **091963-R01 / CWL-D3-FB1**

Lab Sample ID: 340-1751-3 Date Sampled: 03/29/2012 0827
Client Matrix: Air Date Received: 04/05/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1423	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B6784.D
Dilution:	1.0			Initial Weight/Volume:	1147 mL
Analysis Date:	04/26/2012 0415			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Benzyl chloride	ND	cn	4.0	10

MAY 2012 SOIL-GAS SAMPLING RESULTS

CERTIFICATES OF ANALYSIS

Duplicate Samples

Client: Sandia National Laboratories | Job Number: 340-1983-1

Client Sample ID: **092337-001/CWL-UI-2-36**

Lab Sample ID: 340-1983-1 | Date Sampled: 05/07/2012 1407
Client Matrix: Air | Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7035.D
Dilution:	18.2			Initial Weight/Volume:	50 mL
Analysis Date:	05/15/2012 2350			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		73	180
Benzene	ND		36	73
Benzyl chloride	ND		73	180
Bromodichloromethane	ND		36	73
Bromoform	ND		36	73
Bromomethane	ND		36	73
2-Butanone (MEK)	ND		73	180
Carbon disulfide	ND		36	180
Carbon tetrachloride	ND		73	180
Chlorobenzene	ND		36	73
Dibromochloromethane	ND		36	73
Chloroethane	ND		36	73
Chloroform	600		36	73
Chloromethane	ND		36	73
1,2-Dibromoethane (EDB)	ND		36	73
1,2-Dichlorobenzene	ND		36	73
1,3-Dichlorobenzene	ND		36	73
1,4-Dichlorobenzene	ND		36	73
Dichlorodifluoromethane	41	J	36	73
1,1-Dichloroethane	ND		36	73
1,2-Dichloroethane	ND		36	73
cis-1,2-Dichloroethene	ND		36	73
trans-1,2-Dichloroethene	ND		36	73
1,1-Dichloroethene	ND		36	73
1,2-Dichloropropane	ND		36	91
cis-1,3-Dichloropropene	ND		36	91
trans-1,3-Dichloropropene	ND		73	180
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		36	73
Ethylbenzene	ND		36	73
4-Ethyltoluene	ND		36	73
Hexachlorobutadiene	ND		36	73
2-Hexanone	ND		36	180
Methylene Chloride	ND		36	73
4-Methyl-2-pentanone (MIBK)	ND		36	180
Styrene	ND		36	73
1,1,2,2-Tetrachloroethane	ND		36	73
Tetrachloroethene	190		36	73
Toluene	ND		36	73
1,2,4-Trichlorobenzene	ND		46	91
1,1,1-Trichloroethane	ND		36	73
1,1,2-Trichloroethane	ND		36	73
Trichloroethene	3200		36	73
Trichlorofluoromethane	220		36	73
1,1,2-Trichloro-1,2,2-trifluoroethane	790		36	73
1,2,4-Trimethylbenzene	ND		36	91
1,3,5-Trimethylbenzene	ND		36	73

Client: Sandia National Laboratories

Job Number: 340-1983-1

Client Sample ID: **092337-001/CWL-UI-2-36**

Lab Sample ID: 340-1983-1
Client Matrix: Air

Date Sampled: 05/07/2012 1407
Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7035.D
Dilution:	18.2			Initial Weight/Volume:	50 mL
Analysis Date:	05/15/2012 2350			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		73	180
Vinyl chloride	ND		36	73
m,p-Xylene	ND		36	73
o-Xylene	ND		36	73

Client: Sandia National Laboratories | Job Number: 340-1983-1

Client Sample ID: **092338-001/CWL-UI-2-36**

Lab Sample ID: 340-1983-2 | Date Sampled: 05/07/2012 1408
Client Matrix: Air | Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7036.D
Dilution:	22.2			Initial Weight/Volume:	40 mL
Analysis Date:	05/16/2012 0031			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		89	220
Benzene	ND		44	89
Benzyl chloride	ND		89	220
Bromodichloromethane	ND		44	89
Bromoform	ND		44	89
Bromomethane	ND		44	89
2-Butanone (MEK)	ND		89	220
Carbon disulfide	ND		44	220
Carbon tetrachloride	ND		89	220
Chlorobenzene	ND		44	89
Dibromochloromethane	ND		44	89
Chloroethane	ND		44	89
Chloroform	570		44	89
Chloromethane	ND		44	89
1,2-Dibromoethane (EDB)	ND		44	89
1,2-Dichlorobenzene	ND		44	89
1,3-Dichlorobenzene	ND		44	89
1,4-Dichlorobenzene	ND		44	89
Dichlorodifluoromethane	ND		44	89
1,1-Dichloroethane	ND		44	89
1,2-Dichloroethane	ND		44	89
cis-1,2-Dichloroethene	ND		44	89
trans-1,2-Dichloroethene	ND		44	89
1,1-Dichloroethene	ND		44	89
1,2-Dichloropropane	ND		44	110
cis-1,3-Dichloropropene	ND		44	110
trans-1,3-Dichloropropene	ND		89	220
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		44	89
Ethylbenzene	ND		44	89
4-Ethyltoluene	ND		44	89
Hexachlorobutadiene	ND		44	89
2-Hexanone	ND		44	220
Methylene Chloride	ND		44	89
4-Methyl-2-pentanone (MIBK)	ND		44	220
Styrene	ND		44	89
1,1,2,2-Tetrachloroethane	ND		44	89
Tetrachloroethene	190		44	89
Toluene	ND		44	89
1,2,4-Trichlorobenzene	ND		56	110
1,1,1-Trichloroethane	ND		44	89
1,1,2-Trichloroethane	ND		44	89
Trichloroethene	3200		44	89
Trichlorofluoromethane	210		44	89
1,1,2-Trichloro-1,2,2-trifluoroethane	760		44	89
1,2,4-Trimethylbenzene	ND		44	110
1,3,5-Trimethylbenzene	ND		44	89

Client: Sandia National Laboratories

Job Number: 340-1983-1

Client Sample ID: **092338-001/CWL-UI-2-36**

Lab Sample ID: 340-1983-2
Client Matrix: Air

Date Sampled: 05/07/2012 1408
Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7036.D
Dilution:	22.2			Initial Weight/Volume:	40 mL
Analysis Date:	05/16/2012 0031			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		89	220
Vinyl chloride	ND		44	89
m,p-Xylene	ND		44	89
o-Xylene	ND		44	89

Client: Sandia National Laboratories | Job Number: 340-1983-1

Client Sample ID: **092339-001/CWL-D3-480**

Lab Sample ID: 340-1983-3 | Date Sampled: 05/07/2012 1348
Client Matrix: Air | Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7037.D
Dilution:	1.0			Initial Weight/Volume:	918 mL
Analysis Date:	05/16/2012 0112			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	3.4	J	2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	4.3		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	2.0	J	2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	2.1	J	2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	67		2.0	4.0
Trichlorofluoromethane	4.2		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	12		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories Job Number: 340-1983-1

Client Sample ID: **092339-001/CWL-D3-480**

Lab Sample ID: 340-1983-3 Date Sampled: 05/07/2012 1348
Client Matrix: Air Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7037.D
Dilution:	1.0			Initial Weight/Volume:	918 mL
Analysis Date:	05/16/2012 0112			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories | Job Number: 340-1983-1

Client Sample ID: **092340-001/CWL-D3-480**

Lab Sample ID: 340-1983-4 | Date Sampled: 05/07/2012 1351
Client Matrix: Air | Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7038.D
Dilution:	1.0			Initial Weight/Volume:	917 mL
Analysis Date:	05/16/2012 0157			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	3.2	J	2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	61		2.0	4.0
Trichlorofluoromethane	3.7	J	2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	11		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-1983-1

Client Sample ID: **092340-001/CWL-D3-480**

Lab Sample ID: 340-1983-4
Client Matrix: Air

Date Sampled: 05/07/2012 1351
Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7038.D
Dilution:	1.0			Initial Weight/Volume:	917 mL
Analysis Date:	05/16/2012 0157			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

Client: Sandia National Laboratories | Job Number: 340-1983-1

Client Sample ID: **092341-001/CWL-FB1**

Lab Sample ID: 340-1983-5 | Date Sampled: 05/07/2012 1340
Client Matrix: Air | Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7039.D
Dilution:	1.0			Initial Weight/Volume:	944 mL
Analysis Date:	05/16/2012 0238			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Acetone	ND		4.0	10
Benzene	ND		2.0	4.0
Benzyl chloride	ND		4.0	10
Bromodichloromethane	ND		2.0	4.0
Bromoform	ND		2.0	4.0
Bromomethane	ND		2.0	4.0
2-Butanone (MEK)	ND		4.0	10
Carbon disulfide	ND		2.0	10
Carbon tetrachloride	ND		4.0	10
Chlorobenzene	ND		2.0	4.0
Dibromochloromethane	ND		2.0	4.0
Chloroethane	ND		2.0	4.0
Chloroform	ND		2.0	4.0
Chloromethane	ND		2.0	4.0
1,2-Dibromoethane (EDB)	ND		2.0	4.0
1,2-Dichlorobenzene	ND		2.0	4.0
1,3-Dichlorobenzene	ND		2.0	4.0
1,4-Dichlorobenzene	ND		2.0	4.0
Dichlorodifluoromethane	ND		2.0	4.0
1,1-Dichloroethane	ND		2.0	4.0
1,2-Dichloroethane	ND		2.0	4.0
cis-1,2-Dichloroethene	ND		2.0	4.0
trans-1,2-Dichloroethene	ND		2.0	4.0
1,1-Dichloroethene	ND		2.0	4.0
1,2-Dichloropropane	ND		2.0	5.0
cis-1,3-Dichloropropene	ND		2.0	5.0
trans-1,3-Dichloropropene	ND		4.0	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.0	4.0
Ethylbenzene	ND		2.0	4.0
4-Ethyltoluene	ND		2.0	4.0
Hexachlorobutadiene	ND		2.0	4.0
2-Hexanone	ND		2.0	10
Methylene Chloride	ND		2.0	4.0
4-Methyl-2-pentanone (MIBK)	ND		2.0	10
Styrene	ND		2.0	4.0
1,1,2,2-Tetrachloroethane	ND		2.0	4.0
Tetrachloroethene	ND		2.0	4.0
Toluene	ND		2.0	4.0
1,2,4-Trichlorobenzene	ND		2.5	5.0
1,1,1-Trichloroethane	ND		2.0	4.0
1,1,2-Trichloroethane	ND		2.0	4.0
Trichloroethene	ND		2.0	4.0
Trichlorofluoromethane	ND		2.0	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	4.0
1,2,4-Trimethylbenzene	ND		2.0	5.0
1,3,5-Trimethylbenzene	ND		2.0	4.0

Client: Sandia National Laboratories

Job Number: 340-1983-1

Client Sample ID: **092341-001/CWL-FB1**

Lab Sample ID: 340-1983-5
Client Matrix: Air

Date Sampled: 05/07/2012 1340
Date Received: 05/15/2012 1000

TO-14A Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-14A	Analysis Batch:	340-1595	Instrument ID:	MSB
	N/A	Prep Batch:	N/A	Lab File ID:	B7039.D
Dilution:	1.0			Initial Weight/Volume:	944 mL
Analysis Date:	05/16/2012 0238			Final Weight/Volume:	500 mL
Prep Date:	N/A			Injection Volume:	

Analyte	Result (ppb v/v)	Qualifier	MDL	RL
Vinyl acetate	ND		4.0	10
Vinyl chloride	ND		2.0	4.0
m,p-Xylene	ND		2.0	4.0
o-Xylene	ND		2.0	4.0

ANNEX C
Chemical Waste Landfill
CY 2012 Post-Closure Inspection Forms

COVER/SITE INSPECTIONS

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 3/16/12
2. Time of Inspection 1250
3. Name of Inspector Robert Gick

Mandatory requirement:
The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)* RB

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]

Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Visible settlement of the soil cover in excess of 6 inches.	yes	no	
B. Erosion of the soil cover in excess of 6 inches deep.	yes	no	
C. Evidence of water ponding on the CWL cover surface in excess of 100 square feet.	yes	no	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	no	
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	no	

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]

Inspection Parameters	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Channel or sidewall erosion in excess of 6 inches deep.	yes	no	
B. Channel sediment accumulation in excess of 6 inches deep.	yes	no	
C. Debris that blocks more than 1/3 of the channel width.	yes	no	

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Accumulation of wind-blown plants and debris.	yes	no	1
B. Fence wires and posts in need of repair/maintenance.	yes	no	
C. Gates in need of oiling/repair/maintenance.	yes	no	
D. Locks in need of cleaning or replacement.	yes	no	
E. Warning signs in need of repair or replacement.	yes	no	
F. Survey monuments in vicinity of CWL visible.	yes	no	

IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
Uncorrected/undocumented previous deficiencies.	NA	NA	

NA = non applicable

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

NOTES

Note Number	Description
1	There is some accumulation of wind blown plants on the east and west fence line, but not enough to warrant any sort of action.

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

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Inspector's Signature _____

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 6/20/2012
2. Time of Inspection 0847
3. Name of Inspector Robert Zick

Mandatory requirement:
The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)* RZ

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Visible settlement of the soil cover in excess of 6 inches.	yes	No	
B. Erosion of the soil cover in excess of 6 inches deep.	yes	No	
C. Evidence of water ponding on the CWL cover surface in excess of 100 square feet.	yes	No	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Channel or sidewall erosion in excess of 6 inches deep.	yes	No	
B. Channel sediment accumulation in excess of 6 inches deep.	yes	No	
C. Debris that blocks more than 1/3 of the channel width.	yes	yes	1

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Accumulation of wind-blown plants and debris.	yes	No	
B. Fence wires and posts in need of repair/maintenance.	yes	No	
C. Gates in need of oiling/repair/maintenance.	yes	No	
D. Locks in need of cleaning or replacement.	yes	No	
E. Warning signs in need of repair or replacement.	yes	No	
F. Survey monuments in vicinity of CWL visible.	yes	No	

IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
Uncorrected/undocumented previous deficiencies.	NA	No	

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

NOTES

Note Number	Description
1	Tumbleweeds need to be removed from drainage areas on the southeast, southwest, and northwest corners of the site. A Facilities Service Request (#436951) was submitted on 6/20/12 for removal of the Tumble weeds.

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

Action (Note Number) 1 assigned to Robert Zick Date action completed ★

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

★ In progress. A Facilities Service Request (#436951) was submitted on 6/20/12. for removal of the tumbleweeds from drainage areas.

Facilities Service request #436951 was completed on 8/13/12. The field crew removed debris that had accumulated in the storm drainage channels on the southeast, southwest, and northwest corners of the site.

Inspector's Signature Robert Zick RZ 8/15/12

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 9/14/12
2. Time of Inspection 1152
3. Name of Inspector Robert Zock

Mandatory requirement:
The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)* RZ

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Visible settlement of the soil cover in excess of 6 inches.	yes	No	
B. Erosion of the soil cover in excess of 6 inches deep.	yes	No	
C. Evidence of water ponding on the CWL cover surface in excess of 100 square feet.	yes	No	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Channel or sidewall erosion in excess of 6 inches deep.	yes	No	
B. Channel sediment accumulation in excess of 6 inches deep.	yes	No	
C. Debris that blocks more than 1/3 of the channel width.	yes	No	

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Accumulation of wind-blown plants and debris.	yes	No	
B. Fence wires and posts in need of repair/maintenance.	yes	No	
C. Gates in need of oiling/repair/maintenance.	yes	No	
D. Locks in need of cleaning or replacement.	yes	No	
E. Warning signs in need of repair or replacement.	yes	No	
F. Survey monuments in vicinity of CWL visible.	yes	No	

IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
Uncorrected/undocumented previous deficiencies.	NA	NA	

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

NOTES

Note Number	Description

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Additional Comments:

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Inspector's Signature _____

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence

1. Date of Inspection 12/10/12
2. Time of Inspection 1315
3. Name of Inspector Robert Zick

Mandatory requirement:
The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)* RZ

Training records maintained at CAMU Administrative Trailer.

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Visible settlement of the soil cover in excess of 6 inches.	yes	No	
B. Erosion of the soil cover in excess of 6 inches deep.	yes	No	
C. Evidence of water ponding on the CWL cover surface in excess of 100 square feet.	yes	No	
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	yes	No	

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Channel or sidewall erosion in excess of 6 inches deep.	yes	No	
B. Channel sediment accumulation in excess of 6 inches deep.	yes	No	
C. Debris that blocks more than 1/3 of the channel width.	yes	No	

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Accumulation of wind-blown plants and debris.	yes	No	
B. Fence wires and posts in need of repair/maintenance.	yes	No	
C. Gates in need of oiling/repair/maintenance.	yes	No	
D. Locks in need of cleaning or replacement.	yes	No	
E. Warning signs in need of repair or replacement.	yes	No	
F. Survey monuments in vicinity of CWL visible.	yes	No	

IV. PREVIOUS DEFICIENCIES			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
Uncorrected/undocumented previous deficiencies.	NA	NA	

NA = non applicable

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

NOTES

Note Number	Description

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Action (Note Number) _____ assigned to _____ Date action completed _____

Additional Comments:

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Inspector's Signature _____

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center

GROUNDWATER/SOIL-VAPOR EQUIPMENT INSPECTIONS

Chemical Waste Landfill
Post-Closure Inspection Form
Inspection Checklist

1. Date of Inspection 1/17/12
2. Time of Inspection 0750
3. Name of Inspector Robert Lynch

Mandatory requirement:

The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: (*Inspector must initial box before proceeding with the inspection.*) RL

Date read 7/15/11

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]

Inspection Parameters	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Visible settlement of the soil cover in excess of 6 inches.	NO	NO	1
B. Erosion of the soil cover in excess of 6 inches deep.	NO	NO	1
C. Evidence of water ponding.	NO	NO	1
D. Animal intrusion burrows in excess of 4 inches in diameter. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	NO	NO	1
E. Contiguous areas of no vegetation greater than 200 ft^2. Note: For first 3 to 5 years this inspection requirement may be covered on the Cover Biology Checklist.	NO	NO	1

II. SURFACE-WATER (STORM-WATER) DIVERSION STRUCTURES [Quarterly]

Inspection Parameters	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Channel or sidewall erosion in excess of 6 inches deep.	NO	NO	1
B. Channel sediment accumulation in excess of 6 inches deep.	NO	NO	1
C. Debris that blocks more than 1/3 of the channel width.	NO	NO	1

Chemical Waste Landfill
Inspection Checklist (Continued)

III. SECURITY FENCE [Quarterly]			
Inspection Parameters	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Accumulation of wind-blown plants and debris.	NO	NO	1
B. Fence wires and posts in need of repair/maintenance.	NO	NO	1
C. Gates in need of oiling/repair/maintenance.	NO	NO	1
D. Locks in need of cleaning or replacement.	NO	NO	1
E. Warning signs in need of repair or replacement.	NO	NO	1
F. Survey monuments in vicinity of CWL visible.	NO	NO	1

IV. SOIL-GAS AND GROUNDWATER MONITORING WELLS [Semi-Annually]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps and Swagelok® dust caps in need of repair/maintenance.	YES	NO	
C. Passive venting Baroballs™, soil-gas sampling ports, pumps and tubing in need of repair/maintenance.	YES	NO	2
C. Monitoring wells and soil-gas sample port locations properly labeled.	YES	NO	
D. Locks in need of cleaning or replacement.	YES	NO	
V. PREVIOUS DEFICIENCIES [Quarterly]			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
A. Uncorrected/undocumented previous deficiencies.	NA	NA	

Chemical Waste Landfill
Inspection Checklist (Continued)

NOTES

Note Number	Description
1	This inspection pertained only to groundwater and soil-gas monitoring wells and sampling equipment. Inspection of the cover system, surface water diversion structures, and security fench are performed by other inspectors and are documented on another set of post-closure inspection form, inspection checklist.
2	Replaced 2 inch well plugs on soil-gas wells CWL-UI-2 and CWL-D3 with 2 inch baroballs.

Chemical Waste Landfill
Inspection Checklist (Continued)

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Additional Comments:

Inspector's Signature _____

Original to: Chemical Waste Landfill Operating Record

Copy to: Environmental Safety and Health (ES&H) and Security Records Center, MS-1309

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Groundwater Monitoring Locations / Sampling Equipment

1. Date of Inspection 07/05/12
2. Time of Inspection 0910
3. Name of Inspector Robert Lynch

Mandatory requirement:	
The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)*	RL
Training records maintained at CAMU Administrative Trailer.	

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. GROUNDWATER MONITORING LOCATIONS [Semi-annually]			
Inspection Parameter	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps (e.g., PVC caps, J-Plug, or equivalent) in need of repair/maintenance.	YES	NO	1
C. Well casing in need of repair/maintenance.	YES	NO	
D. Monitoring well properly labeled.	YES	NO	
E. Locks in need of cleaning or replacement.	YES	NO	

II. GROUNDWATER SAMPLING EQUIPMENT [Semi-annually]			
Inspection Parameters	***Parameter Inspected (Yes or No)***	***Action Required (Yes or No)***	***Note Number***
A. Sampling pump in need of repair/maintenance.	YES	NO	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	YES	NO	

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Groundwater Monitoring Locations / Sampling Equipment
(continued)

III. PREVIOUS DEFICIENCIES			
Inspection Parameter	*Parameter Inspected (Yes or No)*	*Action Required (Yes or No)*	*Note Number*
Uncorrected/undocumented previous deficiencies.	NA	NA	

NOTES

Note Number	Description
1	Baroball assembly installed on all wells after discussion with NMED personnel on March 5, 2012. CWL-BW5, CWL-MW9, CWL-MW10, CWL-MW11, CWL-2BL

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Groundwater Monitoring Locations / Sampling Equipment
(continued)

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Action (Note Number) _____ assigned to _____ Date action completed_____

Additional Comments:

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Inspector's Signature _____

Original to: Chemical Waste Landfill Operating Record

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BIOLOGY INSPECTION

Chemical Waste Landfill
Post-Closure Inspection Form
Biology Inspection Checklist for the CWL Cover

Mandatory requirement:
The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: *(Inspector must initial box before proceeding with the inspection.)* JP

Training records maintained at CAMU Administrative Trailer.

Approximate vegetative coverage (actively photosynthesizing*): 47 %

Approximate percent native vegetation of the total vegetative cover: 100 %

Listed below are the main plant species identified as growing on the CWL cover and the percentage of the cover populated by each species.

Scientific Name	Common Name (optional)	% of Cover[1]
Bouteloua gracilis	Blue grama	45%
Atriplex canescens	Four-wing salt	2%
Salsola tragus	Russian thistle	trace

* The intent of "Approximate vegetative coverage (actively photosynthesizing)" is to indicate the percent coverage of live plants on the CWL cover. This percent cover includes plants that are photosynthesizing at the time of inspection as well as live dormant plants that are poised to uptake soil moisture as soon as it becomes available and begin photosynthesizing. See Note #1 on next page.

Note: [1] Percentage of total CWL cover populated by actively-photosynthesizing plants of this species

Chemical Waste Landfill
Post-Closure Inspection Form
Biology Inspection Checklist
(continued)

Are there any contiguous areas of no vegetation greater than 200 square feet? (approximately 14 x 14 ft)? No

If "Yes," mark such areas on a map and attach to this checklist. Actively improve such area(s) as detailed in Permit Attachment 1, Section 1.9.1.3.

Are there any very deeply rooted (roots greater than 8 feet deep at maturity) plant species present on the cover? Yes

If "Yes," describe the plant(s) and their general distribution, and remove plant(s) from the cover.

Notes: 1.) 2012 has been an extremely dry year. TA3, where the CWL is located, has received 4.11 inches of precipitation for the calendar year to date. The majority of precipitation has occurred in the form of isolated and minor non-soaking events. The lack of soil moisture is accurately reflected in the lack of actively photosynthesizing native vegetation on the CWL, across TA3, KAFB, and more broadly across all similar upland areas in central New Mexico. The CWL is densely covered by perennial grasses that only turn green due to active photosynthesis when adequate moisture is present. Although the native grasses on the CWL are currently not green, they are consistent with native upland grasses in the area. The grasses are alive and ready to serve their function of moisture uptake on the ET cover whenever precipitation becomes available.

2.) Four-wing saltbush (*Atriplex canescens*) is a native shrub that can develop a deep taproot at maturity. There are approximately one hundred small four-wing saltbush distributed across the cover. These young shrubs currently have shallow root systems. The location of each shrub is not indicated on the map due to the high number shrubs and because each shrub only has a shallow root system at present. All ATCA individuals will be clipped between December 1, 2012 – February 28, 2013. Mortality of ATCA is best achieved by clipping during the winter months. Removal of potentially deep-rooted plant species is not a requirement of the CWL Permit (see Permit Attachment 1, Sections 1.9 and 1.10).

Inspection for animal burrow intrusion into CWL cover

Are any burrows present on the cover? Yes
Do any of the burrows appear to be active? Yes

If burrows with an entrance diameter of 4 inches or greater are present or appear to be that of a species that is able to burrow 6 feet deep or greater, describe below and indicate the location(s) on a map and attach to this checklist. Take appropriate actions as necessary to repair cover system damage that exceeds prescribed limits.

Notes: No mammal burrows were observed on the cover. Only ant burrows were observed on the cover.

Biological Aspects Map -- [note: sketch map to locate specific features described above will be attached as appropriate]

Inspector's Signature: _____ Date: Sept. 18, 2012

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ANNEX D
CY 2012 Chemical Waste Landfill Biology Report

2012 CWL Biology Report

As required by the Chemical Waste Landfill (CWL) Post-Closure Care Permit (PCCP), Attachment 1, Section 1.9.1.1, this summary report for Calendar Year (CY) 2012 represents the results of vegetation inspection and monitoring activities performed by the staff biologist. The purpose of this report is to provide relevant background information, describe local climate trends over the 2012 growing season, expand on the inspection results, and provide recommendations for future Evapotranspirative Cover (ETCover) vegetation inspection, monitoring, and maintenance. The second CWL Post-Closure Biology Inspection of the ET Cover vegetation was conducted on September 18, 2012. The inspection observations are documented in the "Chemical Waste Landfill Post-Closure Inspection Form Biology Inspection Checklist for the CWL Cover."

A self-sustaining plant community is an important component of overall ET Cover performance. Vegetation minimizes erosion by stabilizing the ET Cover surface and moves soil moisture from the ET Cover Topsoil and Native Soil Layers to the atmosphere through transpiration. Vegetation species that are native to the area create the optimal, self-sustaining plant community because the species are specifically adapted to the local climate and soil conditions. The CWL is located at a relatively high elevation and in a challenging semi-arid climate that experiences high temperatures throughout the summer, very cold temperatures in the winter, and infrequent precipitation (i.e., drought conditions). Perennial native grass species provide the best ET Cover performance due to their extensive near-surface root systems that are poised to uptake moisture throughout the year and prevent precipitation from percolating more deeply into the subsurface soil. The deeper roots of perennial native grasses enable them to better withstand drought conditions relative to non-native or annual species.

Background Information

The CWL ET Cover was unsuccessfully seeded in September 2005 after cover construction was completed. In 2009 the staff biologist determined that the CWL ET Cover vegetation would not meet the criteria for successful revegetation in the timeframe specified in the PCCP (i.e., within 5 years of the Permit becoming effective). The CWL was successfully reseeded during the 2009 growing season. The 2009 seeding effort involved weeding the site prior to seeding, drill seeding native grass species, installing gravel mulch, and watering the site during seedling development from late August through October. The native seed mixture included four native grass species and a native shrub, four-wing saltbush (*Atriplex canescens*). The inclusion of the four-wing saltbush was a mistake, as mature plants can develop a deep tap root. Based upon the current conditions of the CWL (all waste areas excavated and backfilled), deeply rooted plants do not pose a threat

relative to mobilizing contaminants. However, as a best management practice in accordance with the PCCP, the shrubs have been regularly monitored and controlled. Removal will continue until the shrubs are eradicated.

The September 2011 CWL ET Cover Biology Inspection determined the ET Cover meets the criteria for successful revegetation as defined in the PCCP. Successful revegetation criteria are defined in the CWL PCCP (Attachment 1, Section 1.9) and were presented along with inspection results in the CY 2011 Annual Report (SNL/NM March 2012).

CY 2012 ET Cover Maintenance

CY 2012 CWL ET Cover maintenance activities included two weed-removal events, conducted in February and September. Removal of the mistakenly planted four-wing saltbush was the primary focus of the February event, although other undesirable annual weedy species were also removed. Greatest mortality of four-wing saltbush is achieved by pulling or clipping the shrubs while dormant during the winter months. Four-wing saltbush was, and will continue to be removed during the winter months in order to most effectively eradicate the shrubs. The main focus of the September weeding event was the removal of snakeweed, Russian thistle, and other annual weedy species. A best faith effort was made to remove both the surface plant and the root system during the two weeding events.

Local Climate Trends for CY 2012 Growing Season

Technical Area 3 (TA-3) meteorological data was analyzed for the years 2010 through November 2012 by the Sandia National Laboratories, New Mexico meteorologist to evaluate year-to-year trends and their impact on plant growth and health on the ET Cover.

Precipitation at the CWL in CY 2012 was significantly below normal for the second consecutive year (Table 1). Nearly half of the moisture in 2012 fell during the monsoon season, though only 2 inches of rain fell during the 3-month "rainy season" (Table 2). Average relative humidity was also low in CY 2012 and temperatures were above normal, with the annual average temperature increasing steadily from CY 2010 through CY 2012 (Table1).

Table 1 Summary of Meteorological Data at the CWL – 2010 through 2012

Year*	Average Temperature		Average % Relative Humidity	Total Precipitation	
2010	14.6°C	58.2°F	40.39	231.90 mm	9.12 inches
2011	15.0°C	59.1°F	33.01	131.57 mm	5.18 inches
2012	15.8°C	60.5°F	33.35	108.71 mm	4.28 inches
* January - November					

Table 2 Summary of Seasonal Precipitation at the CWL – 2010 through 2012

	Seasonal Precipitation							
	January-March		April-June		July-September		October-December	
Year	mm	inches	mm	inches	mm	inches	mm	inches
2010	46.7	1.8	43.7	1.7	109.7	4.3	45.5	1.8
2011	0.3	0.0	5.1	0.2	86.4	3.4	83.1	3.3
2012	26.2	1.0	25.9	1.0	52.3	2.1	9.4	0.4

Meteorological conditions throughout CY 2011 caused significant vegetation stresses. An extremely dry, cold winter with record low temperatures was followed by a dry, hot, and very windy spring. These conditions are a worst-case scenario for vegetation; optimal conditions include ample spring rains prior to the high evaporative demands of the windy spring and early summer seasons. Summer brought consistently warm temperatures that were not counterbalanced by significant summer rains (i.e., wetting rains that result in the percolation of water into the surface soil).

Warm and dry conditions in CY 2012 continued to stress the native vegetation in central New Mexico as topsoil moisture was greatly depleted. An analysis of 24-hour precipitation totals showed that the quantity of daily rainfall in 2012 was not sufficient to wet the soil much beyond the surface crust. Without precipitation penetration below the surface soil, native plants cannot grow and develop sufficient root moisture storage for future use. This recent trend of fewer precipitation events in a year, with smaller amounts of precipitation recorded during those events, is consistent with the regional long-term drought conditions. Higher temperatures coupled with these limited precipitation conditions enhanced the effects of the ongoing drought. Some of the higher temperatures may also be a product of drought conditions. Drought-induced warming can happen as the soil and atmosphere dry out, creating larger temperature ranges, and slightly higher maximum temperatures (Deola, 2013).

September 2012 Inspection Results

The annual CWL ET Cover Biology Inspection was timed to occur near the end of the New Mexico growing season (i.e., September) in order to accurately determine the coverage of living plants. At this time of year, the cumulative effects of the previous winter and the recent growing season can be assessed for the CY by determining the relative abundance and health of the ET Cover vegetation.

Foliar coverage of each species across the site is determined by dividing the cover into smaller sections of approximately 35 meters by 35 meters. Each section is visually inspected and the vegetative percent cover of each living species is documented. An

average coverage across all the sections, is calculated, by species, and recorded on the inspection form as "% of Cover." Species that are present in very low numbers (i.e., less than one-half of one-percent) are recorded as "trace." Species that are present between one-half and one percent are recorded as "1%."

Three vegetation species were documented as living on the cover at the time of inspection. Four-wing saltbush (*Atriplex canescens*), a shrub, was distributed thinly across the ET Cover, covering approximately 2% of the surface area. Russian thistle (*Salsola tragus*), an annual weedy species, was present in trace amounts. Blue grama grass (*Bouteloua gracilis*) was the dominant species, covering approximately 45% of the ET Cover surface area.

Although very little of the grass was green at the time of inspection due to lack of soil moisture, the native blue grama grasses are alive and ready to uptake moisture, if and when present. Native grasses provide near-surface roots for upper soil moisture uptake and deeper roots that can tap deeper soil moisture, which allows them to survive during drought conditions. "Roots of individual blue grama plants generally extend 12 to18 inches (30-46 cm) from the edge of the plant and 3 to 6 feet (0.9-1.8 m) deep (Anderson, M.D. 2003). The state of the native grass on the CWL ET Cover accurately reflects the lack of actively photosynthesizing native vegetation on the CWL, across TA-3, Kirtland Air Force Base, and more broadly across all similar upland areas in central New Mexico in 2012.

No small mammal burrows were observed on the CWL ET Cover. This may be due to the at-grade profile of the ET Cover and the gravel mulch acting as a small animal deterrent. More effort is required for animals to dig through gravel than to build burrows by digging directly into dirt. There were also no contiguous areas 200 square feet or greater that are void of live vegetation. Due to the lack of animal burrows, barren areas, or other features that would typically be shown on a CWL sketch map attached to the Biology Inspection Form, no map was included for the September 2012 inspection.

Figure 1 provides photographs of the ET Cover vegetation taken during the September inspection. The relatively dense growth of perennial native grasses is evident in these photographs (small light-brown patches). The four-wing saltbush plants are the obvious small green shrubs. There were no vegetation repairs or issues identified.

Southwest portion of the cover

Northwest portion of the cover

Southeast portion of the cover

Northeast portion of the cover

Figure 1 September 18, 2012 CWL ET Cover Photos

Fewer species were observed living on the CWL ET Cover during the 2012 inspection than were present in 2011. This observation is consistent with meteorological conditions across CY 2010-CY 2012. The spring of 2011 was extremely dry but the 2011 summer rains provided a moderate amount of precipitation prior to the inspection. There was also likely deeper soil moisture available from 2010 precipitation, which would have been available for deeper root uptake.

At the time of the 2012 inspection, the CWL ET Cover had only received a total of 4.11 inches of precipitation for the year with all moisture occurring as minor, surficial wetting events that quickly evaporated. The last half of 2011 produced an average amount of rain at the CWL ET Cover, much of which would have been immediately utilized by the near-surface roots for 2011 growth. The balance of precipitation that was not overland flow or lost through evapotranspiration would have recharged the upper unsaturated, or vadose,

zone. This deeper soil moisture from 2011 would still be available to maintain native plants but not enough to allow for much photosynthesis. Minimal photosynthesis and no seed production of native grasses was observed during the 2012 inspection. Native grasses are difficult to positively identify without the presence of seed heads. Blue grama was the only grass species that was positively identified consistently across the cover, and historically is the dominant grass species on the CWL ET Cover. During the 2011 survey, the percentage of vegetation coverage only included the percent plant cover that was actively photosynthesizing. The 2012 survey reflected the percent coverage of all living plants on the CWL ET Cover, not just the amount actively photosynthesizing.

Future Expectations

The meteorological records from the last 100 years indicate that precipitation is highly variable from year to year in the Albuquerque region. Of particular note are two time periods: 1) the 25 year period from the mid-1980s to 2010, which experienced a higher precipitation mean than the previous 40 years; and 2) the mid-1940s to mid-1960s that included many, sometimes successive years, of "below normal" precipitation. Routine climate variation in precipitation is anticipated to produce a period of years similar to the means of 1940s and 1950s, with two to three dry years in a row (Deola, 2013).

The most well-established result of climate change for New Mexico is temperature increase. Increased temperatures and reduced precipitation will cause increased soil desiccation. Sun-baked, extremely dry soils become hydrophobic and repel precipitation when it falls, leading to additional soil and plant stress.

Recommendations

The CWL ET Cover currently reflects the surrounding native vegetation that naturally occurs in TA-3 and the surrounding area. This mirroring of the type and condition of perennial, native vegetation continues to successfully meet the ET Cover goals.

Continued removal of the four-wing saltbush and annual weedy species as a best management practice is the only current recommendation for CY 2013.

The CWL ET Cover will continue to be inspected annually as required under the PCCP. If TA-3 experiences a prolonged drought which is determined to compromise the integrity of the ET Cover, limited supplemental watering may be recommended as necessary.

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