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Hazardous Waste Bureau

Subject: Submittal of Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2014, Chemical Waste Landfill Post-Closure Care Permit for Sandia National Laboratories, New Mexico, Environmental Protection Agency Identification Number NM5890110518

Dear Mr. Kieling:

The Department of Energy, National Nuclear Security Administration and the Sandia Corporation are submitting the subject report. This submittal is required by Part 2, Section 2.6.3, of the Chemical Waste Landfill (CWL) Post-Closure Care Permit.

This document is comprised of a main report and four annexes that provide information for post-closure care activities conducted at the CWL during Calendar Year 2014. The report and supporting documentation satisfy requirements listed in Permit Attachment 1, Sections 1.9 and 1.12.

If you have questions, please contact John Weckerle of my staff at (505) 845-6026.

Sincerely,

Mark W. Hamilton
Acting Assistant Manager for
Engineering

Enclosure

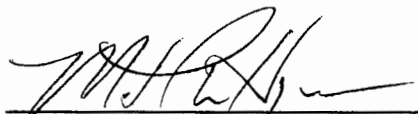
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**Submittal of Chemical Waste Landfill Annual Post-Closure Care Report
Calendar Year 2014
Chemical Waste Landfill Post-Closure Care Permit**

**Sandia National Laboratories
Albuquerque, New Mexico
EPA ID No. 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
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24 Feb 2015

Date signed



James W. Todd, Assistant Manager
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3/17/2015

Date signed



**Sandia
National
Laboratories**

**CHEMICAL WASTE LANDFILL
ANNUAL POST-CLOSURE CARE REPORT
CALENDAR YEAR 2014**

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

MARCH 2015



**U.S. DEPARTMENT OF
ENERGY**

**United States Department of Energy
Sandia Field Office**

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

**ANNUAL CHEMICAL WASTE LANDFILL
POST-CLOSURE CARE REPORT
CALENDAR YEAR 2014**

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 B Chemical Waste Landfill CY 2014 Soil-Gas Monitoring Forms and Reports
- Annex C Chemical Waste Landfill CY 2014 Post-Closure Inspection Forms
- Annex D Chemical Waste Landfill CY 2014 Biology Report

ACRONYMS AND ABBREVIATIONS

AOP	administrative operating procedure
bgs	below ground surface
CAMU	Corrective Action Management Unit
CFR	Code of Federal Regulations
Closure Plan	Chemical Waste Landfill Final Closure Plan
CWL	Chemical Waste Landfill
CY	calendar year
DO	dissolved oxygen
DOE	U.S. Department of Energy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ET	evapotranspirative
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
ORP	oxidation-reduction potential
PCCP	Post-Closure Care Permit
PCE	tetrachloroethene
pH	potential of hydrogen (negative logarithm of the hydrogen ion concentration)
ppbv	parts per billion by volume
ppmv	parts per million by volume
PQL	practical quantitation limit
QC	quality control
RL	reporting limit
RPD	relative percent difference
Sandia	Sandia Corporation
SAP	sampling and analysis plan
SC	specific conductance
SNL	Sandia National Laboratories
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

1.0 INTRODUCTION

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

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 (CFR), 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 2014.

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	Allow 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.
November 7, 2013	Permit Part 3, Attachments 1-4	Provide clarification that alternative formats may be used to document inspections; provide additional detail regarding soil-gas passive venting devices; remove table and text references to the SNL/NM SOW for Analytical Laboratories, the SMO QAPP, and the Groundwater Monitoring HASP; and clarify data quality requirements for soil-gas samples.

Notes:

^aDate represents the effective date of modification.

HASP = Health and safety plan.

QAPP = Quality assurance project plan.

PCCP = Post-Closure Care Permit.

SMO = Sample Management Office.

SNL/NM = Sandia National Laboratories/New Mexico.

SOW = Statement of work.

In addition to permit modifications, DOE/Sandia are required to submit various documents as specified in the PCCP. Table 1-2 summarizes the submittals associated with the PCCP through calendar year (CY) 2014.

Table 1-2
 Chemical Waste Landfill Post-Closure Care Permit Document Submittal History

Date of Submittal ^a	PCCP Requirement	Description of Submittal
July 22, 2011	Permit Attachments 2 & 3	Procedures, plans, and documents cited in the PCCP used by SNL/NM personnel for groundwater and soil-gas monitoring.
February 7, 2012	Permit Attachment 2	Four procedures and one plan related to groundwater monitoring activities that were updated to include minor changes that do not affect sampling procedures or protocols. Two title changes to procedures incorporated into the November 2011 Class 1 permit modification request.
January 24, 2013	Permit Attachments 2 & 3	Updates to reference document (SNL/NM Statement of Work for Analytical Laboratories) related to groundwater and soil-gas monitoring to reflect ongoing modifications and improvements in industry practices.
December 9, 2013	Permit Attachments 2 & 3	Revisions to three procedures related to sample management, shipping, and data review that were revised to keep the documents current and reflecting ongoing modifications and improvements in industry practices.
July 8, 2014	Permit Attachments 2 & 3	Two operating procedures cited in the PCCP used by SNL/NM personnel to validate analytical data from contract laboratories and conduct activities related to sampling CWL soil-gas wells.

Notes:

^aDate represents the date stamp on the DOE transmittal letter for the submittal.

PCCP = Post-Closure Care Permit.

SNL/NM = Sandia National Laboratories/New Mexico.

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 CY 2014 in accordance with Attachment 1 of the PCCP (NMED October 2009 and subsequent revisions). This annual report documents PCCP activities conducted from January through December 2014 and fulfills the PCCP requirement for annual reporting to the New Mexico Environment Department (NMED).

The PCCP requires monitoring, inspection, and maintenance/repair 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 2014. Monitoring and inspections performed during this time period included:

- 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 evapotranspirative [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 2014 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 2014 reporting period.
- Chapter 9 lists the references cited in this report.

Annexes are provided that include CY 2014 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

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 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/NM 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.

2.1 Background

Two voluntary corrective measures (VCMs) were conducted during closure of the CWL. A soil-vapor extraction (VE) VCM was conducted from 1997 through 1998 to reduce the concentrations of VOC soil gas in the vadose zone, to control the VOC soil-gas plume, and to reduce groundwater trichloroethene (TCE) concentrations below the regulatory standard of 5 micrograms per liter ($\mu\text{g/L}$). TCE concentrations in groundwater have been below 5 $\mu\text{g/L}$ since completion of the VE VCM in 1998. Following the VE VCM, the CWL Landfill Excavation (LE) VCM was conducted from September 1998 through February 2002. All former disposal areas were excavated during the LE VCM. The excavation was backfilled and an ET cover was constructed over the landfill.

Additional information on the VCMs, other closure activities, and CWL current conditions can be found in the CWL Final RCRA Closure Report for the CWL (SNL/NM September 2010), the 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 PCCP (NMED October 2009 and subsequent revisions).

2.2 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 native plants

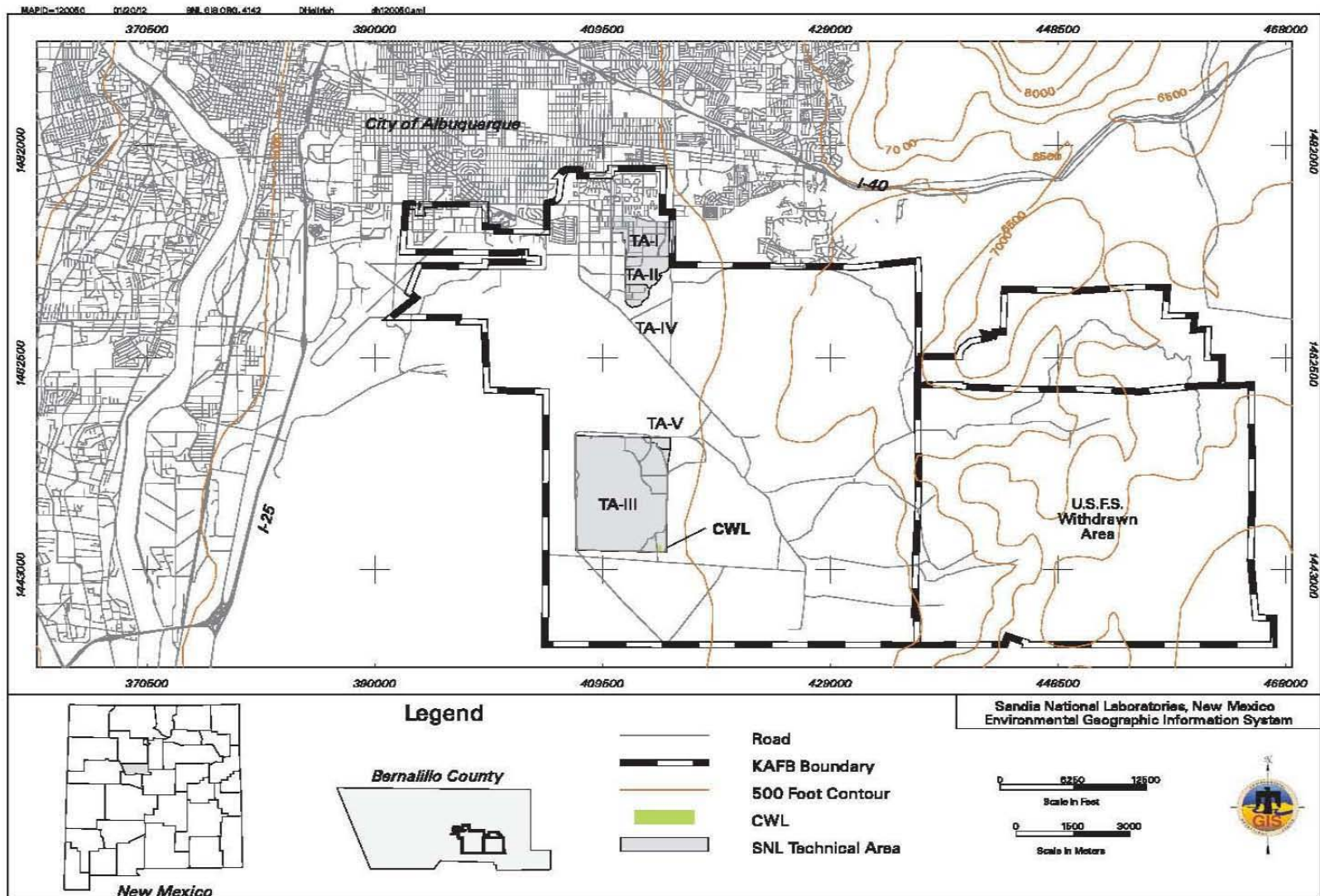


Figure 2-1
Location of the Chemical Waste Landfill with respect to Kirtland Air Force Base and the City of Albuquerque

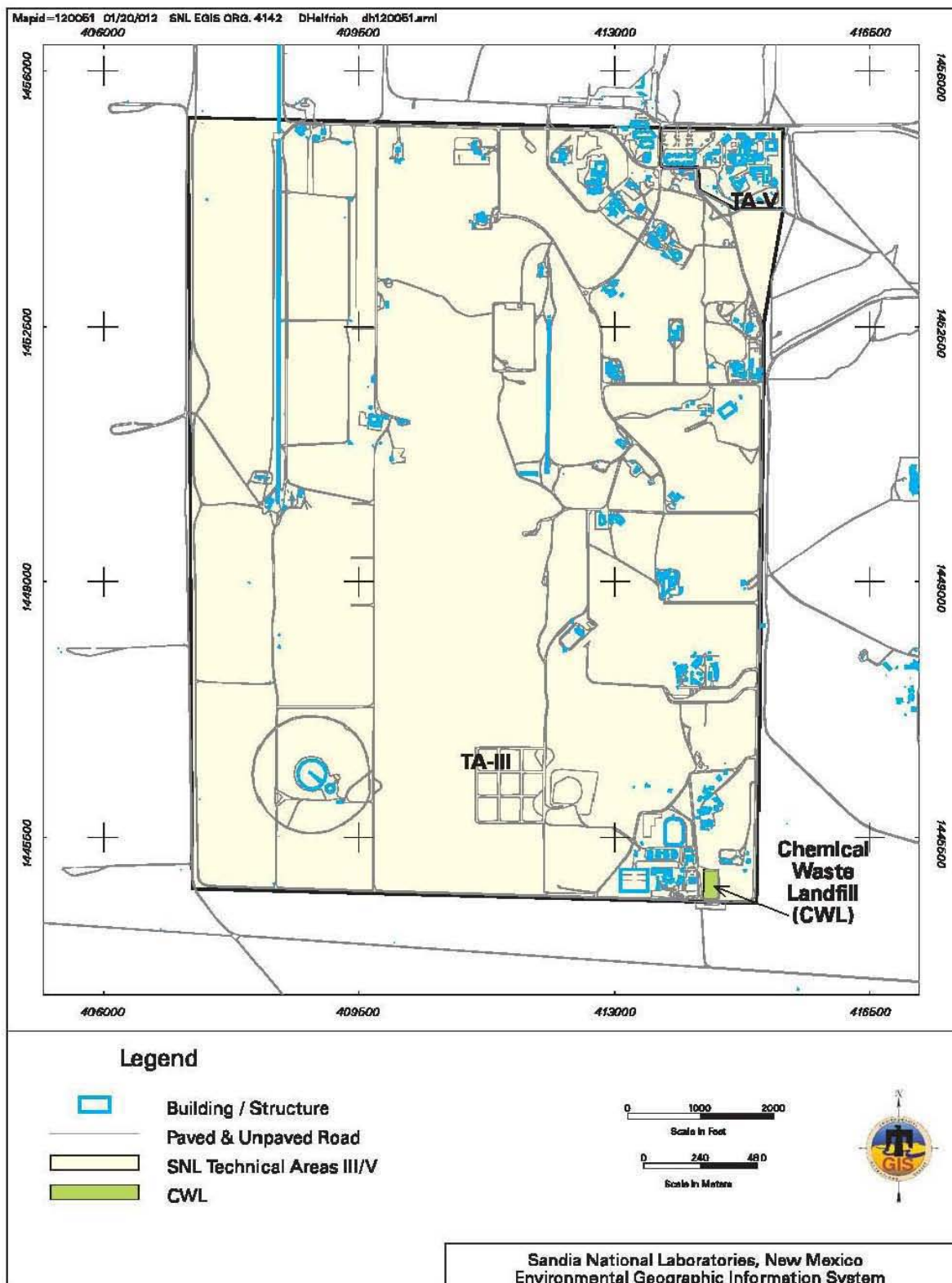


Figure 2-2
Location of the Chemical Waste Landfill within Technical Area III

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.

2.3 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.

2.3.1 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.

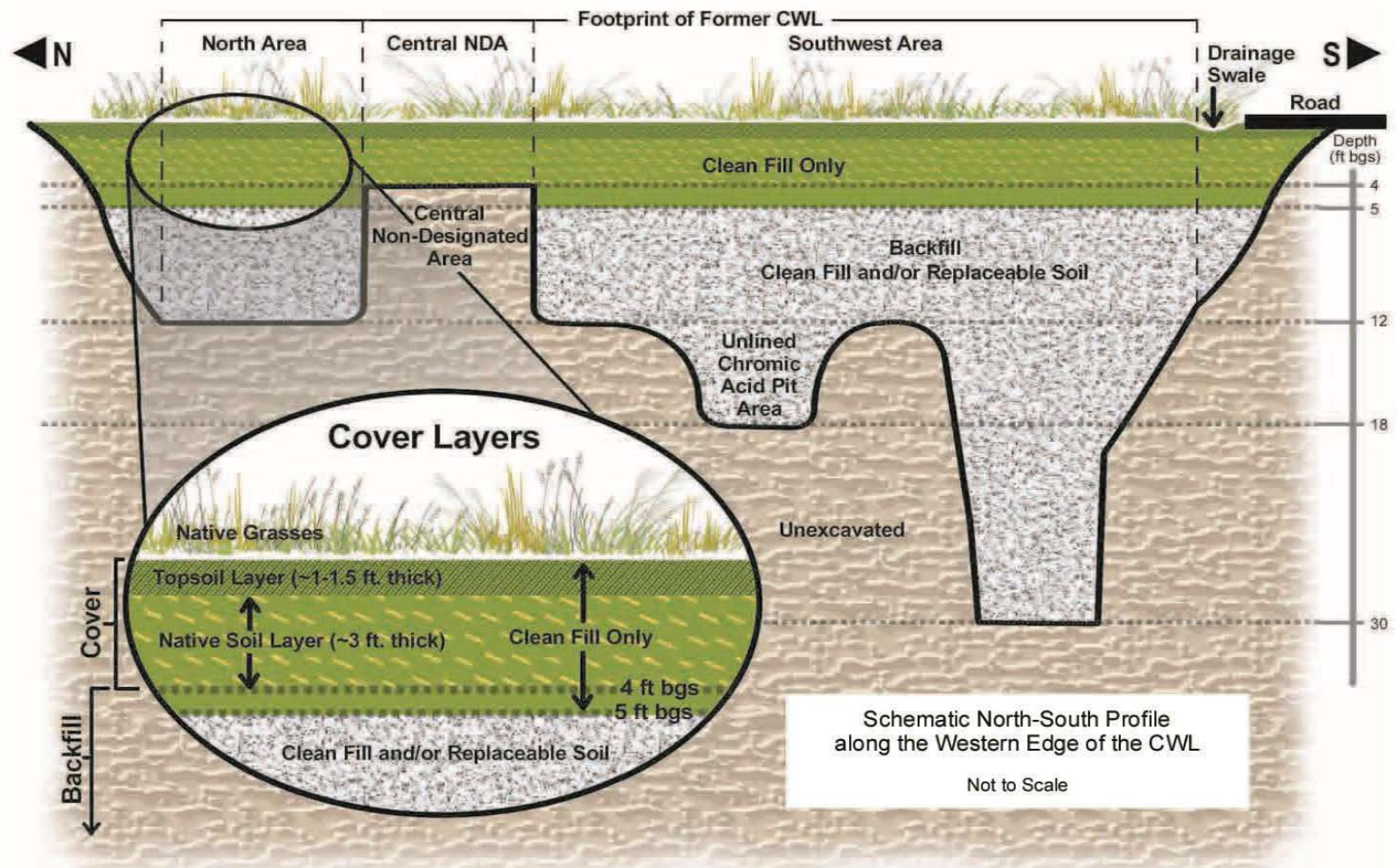
Well-completion diagrams for the groundwater monitoring wells are provided in Attachment 2 of the PCCP (NMED October 2009 and subsequent revisions).

2.3.2 Soil-Gas Monitoring Network

The soil-gas monitoring network is designed to ensure the protection of groundwater quality by providing early detection data to indicate 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)
- UI1 – Sampling Ports at 40, 80, and 120 feet bgs (3 ports)
- UI2 – 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 PCCP (NMED October 2009 and subsequent revisions).



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

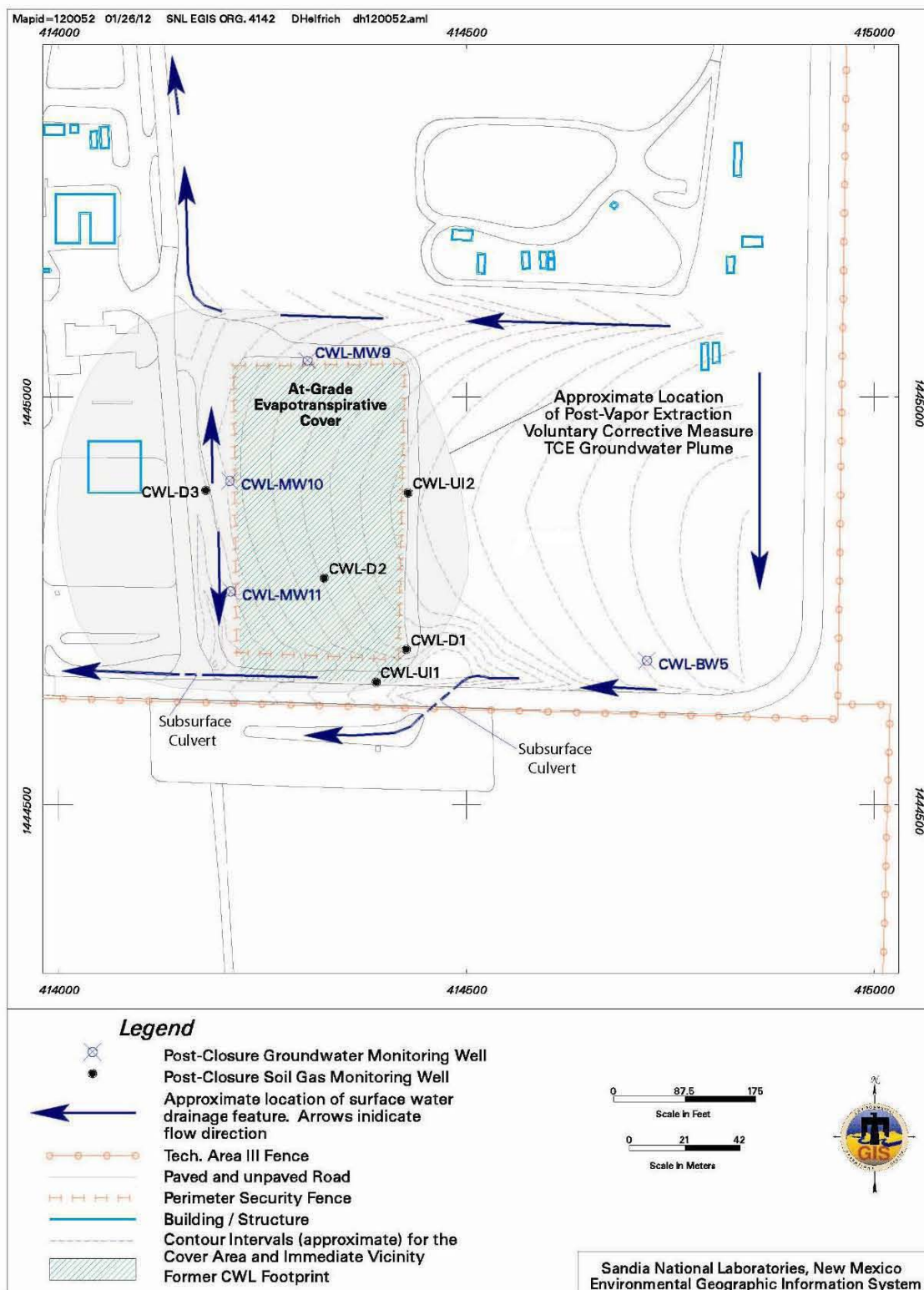


Figure 2-4
 Chemical Waste Landfill Surface Drainage Patterns and Monitoring Networks

2.4 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 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 (Figure 2-4). 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.

2.5 Security Fence

The location of the perimeter security fence 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. The keys to the locks are controlled by authorized personnel. 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 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 during 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 (PCCP Attachment 6) is also subject to routine inspections. Maintenance and/or repairs are performed based upon the inspection results. 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, inspection, and maintenance/repair activities were conducted in CY 2014 in accordance with PCCP Attachment 1, Sections 1.8 through 1.10. Results of CY 2014 monitoring, inspection, and repair 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 and inspection activity 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 PCCP Attachment 1, Section 1.8. Sampling and analysis plans (SAPs) in 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-Annual ^a	TCE by EPA Method 8260 ^b and Cr and Ni by EPA Method 6020 ^b	Sampling and Analysis per PCCP Attachment 2
Soil-Gas	Annual	EPA Compendium Method TO-14 VOCs ^c or equivalent ^d	Sampling and Analysis per PCCP Attachment 3

Notes:

^aSemi-Annual: An enhanced list of constituents must be analyzed on an annual basis (see Section 1.8.1.1 of PCCP Attachment 1).

^bEPA November 1986.

^cEPA January 1999a. See Table 1-5 in PCCP Attachment 1 for the list of the TO-14 VOCs.

^dUse 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.

For all groundwater monitoring events, environmental samples must be analyzed for TCE, chromium, and nickel. Additionally, during one semi-annual event each year, environmental samples must be analyzed for an enhanced list of VOCs 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). 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 (PCCP Attachment 3) using U.S. Environmental Protection Agency (EPA) Compendium Method TO-14 (EPA January 1999a) or equivalent (i.e., such as the newer method TO-15 [EPA January 1999b]) 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 PCCP Attachment 1, Section 1.9. All inspections were performed by personnel who meet the qualification and training requirements of PCCP Attachment 5. The schedule for implementing inspections and prescribed maintenance and/or repairs is provided in PCCP Attachment 1, Section 1.10, Table 1-6. Maintenance and/or repairs are performed as needed based upon the inspection results.

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 and maintaining 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 reduces infiltration of surface water by transferring 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 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).

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 (PCCP Attachment 4 or equivalent) and include inspecting the cover for contiguous areas lacking vegetation in excess of 200 square feet, signs of animal intrusion, and deep-rooted plants. Repairs required as a result of the inspections to address vegetation parameters not meeting 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 to 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 (PCCP Attachment 4 or equivalent), include inspection results for the same parameters, 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 (PCCP Attachment 4 or equivalent). 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 (or equivalent). 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 (or equivalent).

3.2.1.3 *Cover Repairs*

Cover damage exceeding PCCP specifications must 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. These inspections are to be performed at the same time as the cover inspections. Erosion of the channels or sidewalls in excess of 6 inches deep, accumulations of silt greater than 6 inches deep, or debris that blocks more than one-third of the channel width must be documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent). 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 be documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent) and 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 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. Accumulation of wind-blown plants and debris that would interfere with any of the groundwater or soil-gas monitoring network components will also be documented and removed during these inspections, or 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 concurrently with the cover inspection. The condition of the fence, including fence wires, posts, gates, locks, and warning signs, is to be inspected and documented on the Post-Closure Inspection Form/Inspection Checklist (PCCP Attachment 4 or equivalent). Accumulation of wind-blown plants and debris on the fence that would obscure warning signs or block access to the CWL will be documented during the inspection and the material removed within 60 days. Local survey monuments must also 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 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 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 2014 in accordance with PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 2 (NMED October 2009 and subsequent revisions). 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.

Two semi-annual groundwater sampling events were conducted in CY 2014.

- The first sampling event was conducted January 9-15, 2014. Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11, and a duplicate sample was collected from CWL-BW5. Samples collected from all wells were analyzed for TCE, chromium, nickel, and the enhanced list of VOCs. 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), and trichlorofluoromethane (Freon 11) in addition to TCE.
- The second sampling event was conducted July 7-11, 2014. Groundwater samples were collected from monitoring wells CWL-BW5, CWL-MW9, CWL-MW10, and CWL-MW11, and a duplicate sample was collected from CWL-MW9. Samples collected from all wells were analyzed for TCE, chromium, and nickel.

4.1.1 Well Purging

Purging removes stagnant water from the well so that a representative groundwater sample can be collected. The minimum purge requirement for a portable piston pump is one saturated casing volume (the volume of all static water in the well screen plus the borehole annulus around the saturated screen interval). During groundwater sampling at the CWL, purging

continued until four stable field measurements for temperature, specific conductance (SC), potential of hydrogen (pH), and turbidity were obtained in all monitoring wells that did not purge dry. As specified in PCCP Attachment 2, Section 2.12, groundwater stability is considered acceptable when four successive measurements are less than five nephelometric turbidity units (NTU) for turbidity or within a range of 10 percent for turbidity values greater than 5 NTU, 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™ EXO Water Quality Meter and a HACH™ Model 2100Q portable turbidity meter. Additional water quality measurements included oxidation-reduction potential (ORP) and dissolved oxygen (DO).

A portable Bennett Company groundwater sampling system was used to purge and collect groundwater samples from all wells. Minimum purge requirements were satisfied at all monitoring wells except CWL-MW10. In accordance with PCCP Attachment 2, Section 2.12, 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 CWL-MW10, 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 CWL-MW10, the flow rate was 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.

During January approximately 16.5 gallons were purged from monitoring well CWL-MW10 prior to the well going dry. The average flow rate was 0.14 gallons per minute (gpm), and the estimated flow rate was 0.12 gpm during the final four gallons (equivalent to 0.53 and 0.45 liters per minute, respectively). During July approximately 18 gallons were purged from CWL-MW10 prior to the well going dry. The average flow rate was 0.078 gpm, and the estimated flow rate was 0.065 gpm during the final four gallons (equivalent to 0.30 and 0.25 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.

Duplicate samples were analyzed to estimate the overall reproducibility of the sampling and analysis process and were collected immediately after the original environmental sample to reduce variability caused by time and/or sampling mechanics. Equipment blank (also referred to as a rinsate blank) samples were collected prior to collection of an environmental sample, to verify the equipment decontamination process. Trip blank samples are used to evaluate potential contamination by VOCs during sampling, shipment, and the laboratory process. Field blank samples are used to evaluate potential sample contamination by VOCs resulting from ambient field conditions.

The field QC samples were submitted for analysis with the groundwater samples. A brief explanation of the field QC sampling protocol for the January and July sampling events is provided below. Analytical results are presented in Section 4.2.2.

First Semi-Annual Sampling Event – January 9-15, 2014

A duplicate environmental sample was collected from CWL-BW5. One equipment blank sample was collected prior to sampling CWL-BW5 and submitted for all analyses. A total of five trip blank samples were submitted with the January 2014 groundwater samples and analyzed for the enhanced list of VOCs. Two field blank samples were collected for VOC analysis (enhanced list) by pouring deionized water into sample containers at the CWL-BW5 and CWL-MW10 sample locations to simulate the transfer of environmental samples from the sampling system to the sample container.

Second Semi-Annual Sampling Event – July 7-11, 2014

A duplicate environmental sample was collected from CWL-MW9. One equipment blank sample was collected prior to sampling CWL-MW9. The samples were submitted for all analyses. A total of five trip blank samples were submitted with the July 2014 groundwater samples and analyzed for TCE. Four field blank samples were collected for TCE analysis by pouring deionized water into sample containers at each CWL monitoring well location 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 260 gallons of wastewater were generated during each groundwater sampling event (total of 520 gallons). Separate waste characterization samples were collected from purge and decontamination water and analyzed for discharge parameters. All wastewater was discharged to the sanitary sewer in accordance with Albuquerque Bernalillo County Water Utility Authority requirements after waste characterization data were compared to discharge limits and determined to meet these requirements.

Personal protective equipment and other solid waste generated during January and July 2014 monitoring activities were packaged into 5-gallon plastic buckets and managed as hazardous waste. This waste was managed at the Hazardous Waste Handling Unit prior to disposal at a permitted off-site facility.

4.2 Laboratory Results

Groundwater 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 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 reports 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 2014 groundwater sampling events. Table 4-3 summarizes results for the additional VOCs (enhanced list) included in the January 2014 event. 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. Statistical evaluation and comparison of results to concentration limits specified in the PCCP is provided in Section 4.3.

Table 4-1
 Summary of Trichloroethene Results
 Chemical Waste Landfill Groundwater Monitoring
 Analytical Method SW846-8260B^a
 Calendar Year 2014

Well ID	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier ^b	Validation Qualifier ^b
January 2014 Sampling Event					
CWL-BW5	ND	0.300	1.00	U	--
CWL-BW5 (Duplicate)	ND	0.300	1.00	U	--
CWL-MW9	ND	0.300	1.00	U	--
CWL-MW10	2.75	0.300	1.00	--	--
CWL-MW11	ND	0.300	1.00	U	--
July 2014 Sampling Event					
CWL-BW5	ND	0.300	1.00	U	--
CWL-MW9	ND	0.300	1.00	U	--
CWL-MW9 (Duplicate)	ND	0.300	1.00	U	--
CWL-MW10	1.12	0.300	1.00	--	--
CWL-MW11	ND	0.300	1.00	U	--

Notes:

^aU.S. Environmental Protection Agency, 1986 (and updates), “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” SW-846, 3rd edition.

^bLaboratory/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.

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 the applicable 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 2014

Well ID	Analyte	Result (mg/L)	MDL (mg/L)	PQL (mg/L)	Laboratory Qualifier ^b	Validation Qualifier ^b
January 2014 Sampling Event						
CWL-BW5	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00267	0.0005	0.002	--	--
CWL-BW5 (Duplicate)	Chromium	ND	0.002	0.010	U	--
	Nickel	0.0027	0.0005	0.002	--	--
CWL-MW9	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00187	0.0005	0.002	J	J-
CWL-MW10	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00311	0.0005	0.002	--	--
CWL-MW11	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00284	0.0005	0.002	--	--
July 2014 Sampling Event						
CWL-BW5	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00166	0.0005	0.002	J	J-
CWL-MW9	Chromium	ND	0.002	0.010	U	--
	Nickel	0.0015	0.0005	0.002	J	J-
CWL-MW9 (Duplicate)	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00162	0.0005	0.002	J	J-
CWL-MW10	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00239	0.0005	0.002	--	--
CWL-MW11	Chromium	ND	0.002	0.010	U	--
	Nickel	0.00142	0.0005	0.002	J	J-

Notes:

^aU.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.

^bLaboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted sample. See explanation for "B," "J," "J-," and "U" qualifiers below.

J = Amount detected is below the practical quantitation limit (PQL).

J- = The associated numerical value is an estimated quantity with a suspected negative bias.

U = Analyte is absent or below the method detection limit, if a number is shown units are mg/L.

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 the applicable 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 2014

Well ID	Analyte	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-BW5	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--
CWL-MW9	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--
CWL-MW9 (Duplicate)	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--
CWL-MW10	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--

Refer to footnotes at end of table.

Table 4-3 (Concluded)
 Summary of Additional Volatile Organic Compound Results
 Chemical Waste Landfill Groundwater Monitoring
 Analytical Method SW846-8260B^a
 January 2014

Well ID	Analyte	Result (µg/L)	MDL (µg/L)	PQL (µg/L)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-MW11	1,1-Dichloroethene	ND	0.300	1.00	U	--
	Chloroform	ND	0.300	1.00	U	--
	Tetrachloroethene	ND	0.300	1.00	U	--
	Trichlorofluoromethane	ND	0.300	1.00	U	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.50	5.00	U	--

Notes:

^aU.S. Environmental Protection Agency, 1986 (and updates), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd edition.

^bLaboratory/Validation Qualifier - If cell is blank (--), then all quality control samples met acceptance criteria with respect to submitted samples.

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 the applicable 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 2014

Well ID	Temperature (°C)	SC (µmho/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (% Sat)	DO (mg/L)
January 2014 Sampling Event							
CWL-BW5	19.20	935.0	263.1	6.99	0.94	76.9	7.07
CWL-MW9	19.16	829.0	103.7	7.07	0.29	25.5	2.36
CWL-MW10	17.13	742.5	64.4	7.17	1.90	21.1	2.03
CWL-MW11	18.04	844.9	240.9	7.07	0.87	51.9	4.95
July 2014 Sampling Event							
CWL-BW5	25.66	1135.9	279.4	6.90	0.30	84.7	6.88
CWL-MW9	25.91	1029.6	183.1	6.95	0.21	38.8	3.14
CWL-MW10	25.05	964.9	-18.1	7.05	1.76	34.9	2.87
CWL-MW11	27.61	1105.8	300.2	6.94	0.36	65.9	5.18

Notes:

^aField measurements collected prior to sampling.

°C = Degrees Celsius.

% Sat = Percent 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.

First Semi-Annual Sampling Event – January 9-15, 2014

TCE was detected above the laboratory MDL in the CWL-MW10 sample at a concentration of 2.75 µg/L. No other VOCs (enhanced list) were detected.

Chromium was not detected above the laboratory MDL in any samples. Nickel was detected in all groundwater samples at concentrations ranging from 0.00187 milligrams per liter (mg/L) to 0.00311 mg/L.

Second Semi-Annual Sampling Event – July 7-11, 2014

TCE was only detected above the laboratory MDL in the CWL-MW10 sample at a concentration of 1.12 µg/L. There were no other detections of TCE.

Chromium was not detected above the laboratory MDL in any of the groundwater samples. Nickel was detected in all samples at concentrations from 0.00142 mg/L to 0.00239 mg/L.

4.2.2 Field Quality Control Sample Results

Tables 4-1 through 4-4 present 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 for the January (CWL-BW5) and July (CWL-MW9) 2014 sample pairs. Nickel was the only analyte detected in both environmental-duplicate sample pairs; no VOCs or chromium were detected. RPD values for nickel and show good agreement (i.e., RPD values < 35 for metals).

One equipment blank sample was collected in January and analyzed for all constituents. Chloroform was detected in the January equipment blank sample at a concentration of 2.58 µg/L. No corrective action was necessary since chloroform was not detected in the associated environmental sample (i.e., CWL-BW5 sample). The equipment blank sample collected in July was analyzed for all constituents; no constituents were detected in the sample.

Table 4-5
 Summary of Duplicate Sample Results
 Chemical Waste Landfill Groundwater Monitoring
 Calendar Year 2014

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD ^a
January 2014 Sampling Event (CWL-BW5)			
Nickel (mg/L)	0.00267	0.0027	1
July 2014 Sampling Event (CWL-MW9)			
Nickel (mg/L)	0.0015	0.00162	8

Notes:

^aRPD = Relative percent difference is calculated with the following equation and rounded to the nearest whole number.

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

where: R₁ = Environmental sample result.
 R₂ = Duplicate sample result.

mg/L = Milligram(s) per liter.

Of the five trip blank samples and two field blank samples associated with the January sampling event, the only detection was chloroform in both of the field blank samples. No corrective action was required since chloroform was not detected in any of the environmental samples. The five trip blank samples and four field blank samples associated with the July sampling event were analyzed for TCE. TCE was detected in the field blank sample collected at the CWL-MW11 location at a concentration of 3.3 µg/L. No corrective action was required as TCE was not detected in the associated environmental sample.

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 were analyzed concurrently with all environmental samples in accordance with laboratory procedures and EPA methods. These samples included laboratory control samples, method blanks, matrix spike and matrix spike duplicate samples, surrogate spike samples, and replicate samples. The results were used to evaluate potential contamination associated with the laboratory analytical process and to determine the accuracy and precision of the analytical methods. All chemical data were 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 June 2014a). Minor issues documented during the data validation process are summarized below.

For the January 2014 sampling event, chloroform was detected at very low concentrations in both the equipment and field blank samples. It is a by-product of the deionized water purification process (i.e., chlorination) and is routinely detected in equipment blank and field blank samples at very low concentrations.

Although infrequent, the detection of TCE in the field blank sample collected at the CWL-MW11 during the July 2014 sampling event demonstrates that very low detections of VOCs are possible as a result of ambient conditions. Note that this sample was collected by pouring deionized water directly into the sample container to simulate the transfer of environmental samples from the sampling system to the sample container. The deionized water did not travel through the portable Bennett sampling system.

Based upon the data validation and review criteria, all analytical data were determined acceptable. Reported QC samples results were in compliance with analytical method and laboratory procedure requirements (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 or non-conformances were identified during the January and July 2014 semi-annual groundwater sampling events.

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 three years of groundwater sampling results have been obtained (i.e., minimum data set for statistical analysis as defined by the NMED is six analytical results). For replacement wells, historical groundwater sampling results are used to augment the data sets and increase the amount of data available for statistical analysis. Historical groundwater

data is limited to data obtained no earlier than May 1998 (i.e., near the completion of the VE VCM).

Statistical evaluation of the groundwater data includes results from CWL-BW5 (and historical background well CWL-BW4A), as well as CWL-MW9, CWL-MW10, and CWL-MW11. Wells CWL-MW9, CWL-MW10, and CWL-MW11 are new wells installed in 2010 and have been sampled eight times as of July 2014 (November-December 2010, July-August 2011, January and July 2012, January and July 2013, January and July 2014). Statistical evaluation of the results from these wells was first presented in the CY 2013 Annual Report. CWL-BW5 is a replacement well for CWL-BW4A. All results for CWL-BW5 and historic results for CWL-BW4A were used for the statistical evaluation presented in the following sections.

4.3.1 Statistical Assessment Requirements

Groundwater monitoring data are statistically evaluated on a well-by-well basis for each of the three hazardous constituents in accordance with the requirements stated in 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 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 whether 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. For duplicate analyses, only the highest detection is used for statistical analysis. If a detection is qualified as “not detected” during data validation due to blank contamination, the original result reported by the laboratory is used for statistical analysis. More detailed information regarding statistical assessment requirements is provided below. Statistical assessment results for CY 2014 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	SNL/NM background level, 40 CFR § 264.94(a)(1)

Notes:
 CFR = Code of Federal Regulations
 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) 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 90%. Strictly for comparison, CY 2014 sample results are also compared to the historical range (minimum and maximum result derived from historical results not including CY 2014 results) to determine whether they 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 4-6. If it exceeds the concentration limit, this is considered statistically significant evidence that the concentration limit has been exceeded, and it triggers corrective action in accordance with PCCP Attachment 1, Section 1.8.3. Individual sample results are not directly compared to concentration limits, and if an individual result exceeds the concentration limit this does 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 2014 CWL-BW5/4A sample results are compared was calculated using all historic results obtained since May 1998 (i.e., completion of the VE VCM) not including the July 2014 sample results. For the next groundwater monitoring event, the median will be recalculated and will include the July 2014 sample results. If the cumulative percentage of results greater than the median for a given hazardous constituent is 80% or greater, that is considered statistically significant evidence of increased contamination. However, no action is required in the case of statistically significant evidence of increasing contamination unless the 95% LCL of the mean for a given constituent exceeds the respective concentration limit (NMED October 2009 and subsequent revisions).

4.3.2 Statistical Assessment Results

CY 2014 groundwater sampling data and statistical analysis for CWL-BW5/4A, CWL-MW9, CWL-MW10, and CWL-MW11 are discussed in this section. Statistical assessment results are presented in Table 4-7 and shown graphically in Figures 4-1 through 4-9.

Table 4-7
Statistical Assessment Results Summary
Chemical Waste Landfill
Calendar Year 2014 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 ?
CWL-BW5/4A									
Chromium (mg/L)	0.00038	0.0125	0.00329	0.00312	0.00237	0.00421	Normal	43%	No
Nickel (mg/L)	0.00109	0.049	0.00544	0.0083	0.00299	0.00789	Normal	47%	No
TCE (µg/L)	0.1	0.78	0.35	0.134	0.311	0.389	Normal	3%	No
CWL-MW9									
Chromium (mg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
Nickel (mg/L)	0.00198	0.00435	0.00305	0.0011	0.00231	0.00379	Normal	40%	No
TCE (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No
CWL-MW10									
Chromium (mg/L)	0.002	0.00325	0.00231	0.000569	0.00193	0.00269	Normal	20%	No
Nickel (mg/L)	0.00234	0.00707	0.0036	0.00158	0.00254	0.00466	Normal	20%	No
TCE (µg/L)	1.11	4.68	2.831	1.452	1.858	3.804	Normal	40%	No
CWL-MW11									
Chromium (mg/L)	0.002	0.00304	0.00227	0.00040019	0.002	0.00254	Normal	40%	No
Nickel (mg/L)	0.00172	0.00449	0.00276	0.00101	0.00208	0.00344	Normal	20%	No
TCE (µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	No

Notes:

^aHazardous Constituents from CWL Permit Attachment 1, Section 1.4.1, Table 1-2 (Table 4-6 of this report).

^bMinimum and maximum result determined from historical data not including 2014 sample results.

^cMean, LCL, UCL, Standard Deviation, and Distribution Type determined using ProUCL statistical program.

^dMedian Test is the cumulative percentage of sample results that are greater than the median.

^eExceedance 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.

NA = Not Applicable; constituent has not been detected in any samples from this monitoring well.

mg/L = Milligrams/liter.

TCE = Trichloroethene.

UCL = Upper confidence limit.

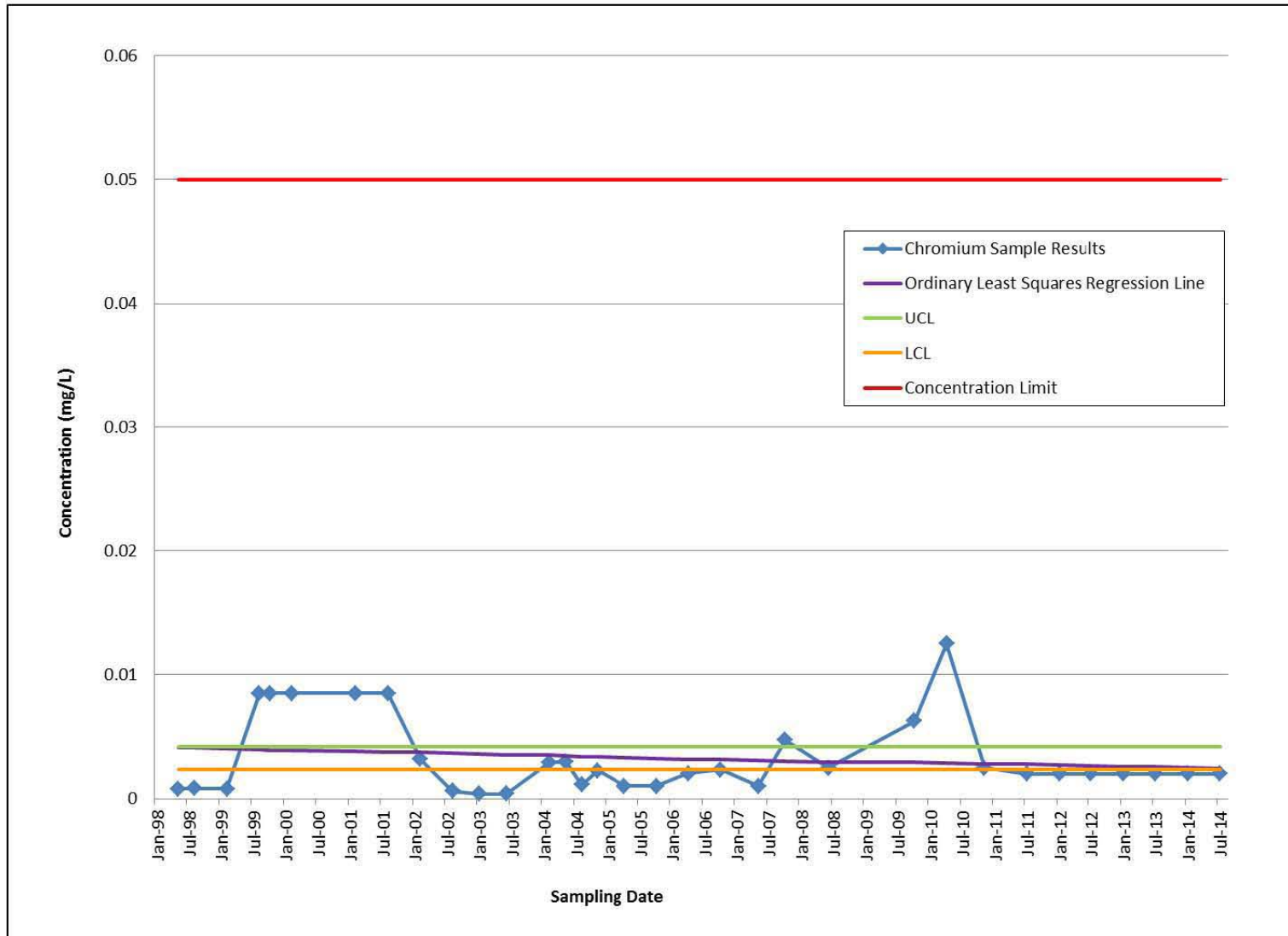


Figure 4-1
Chromium Control Chart for CWL-BW5/4A

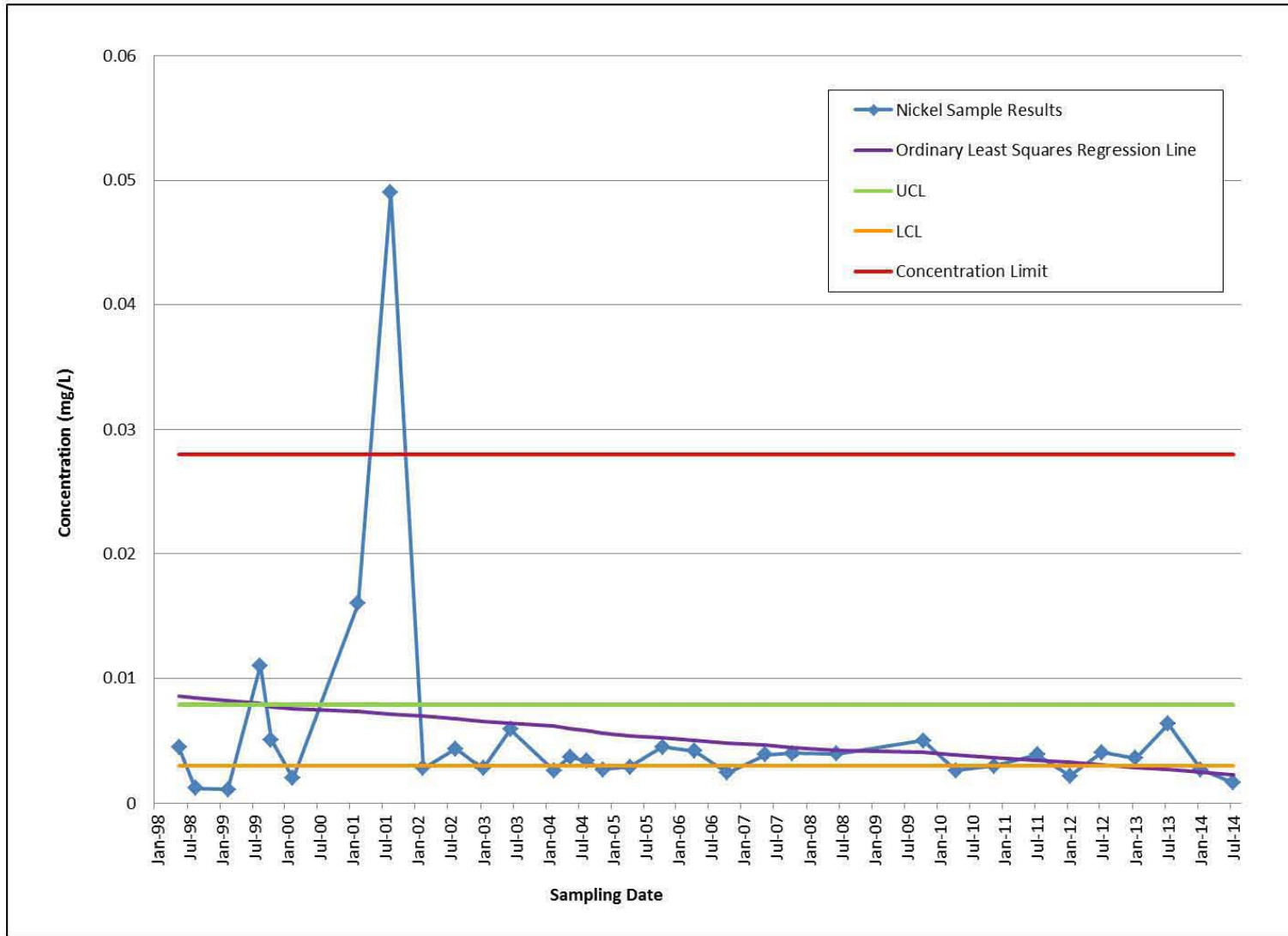


Figure 4-2
Nickel Control Chart for CWL-BW5/4A

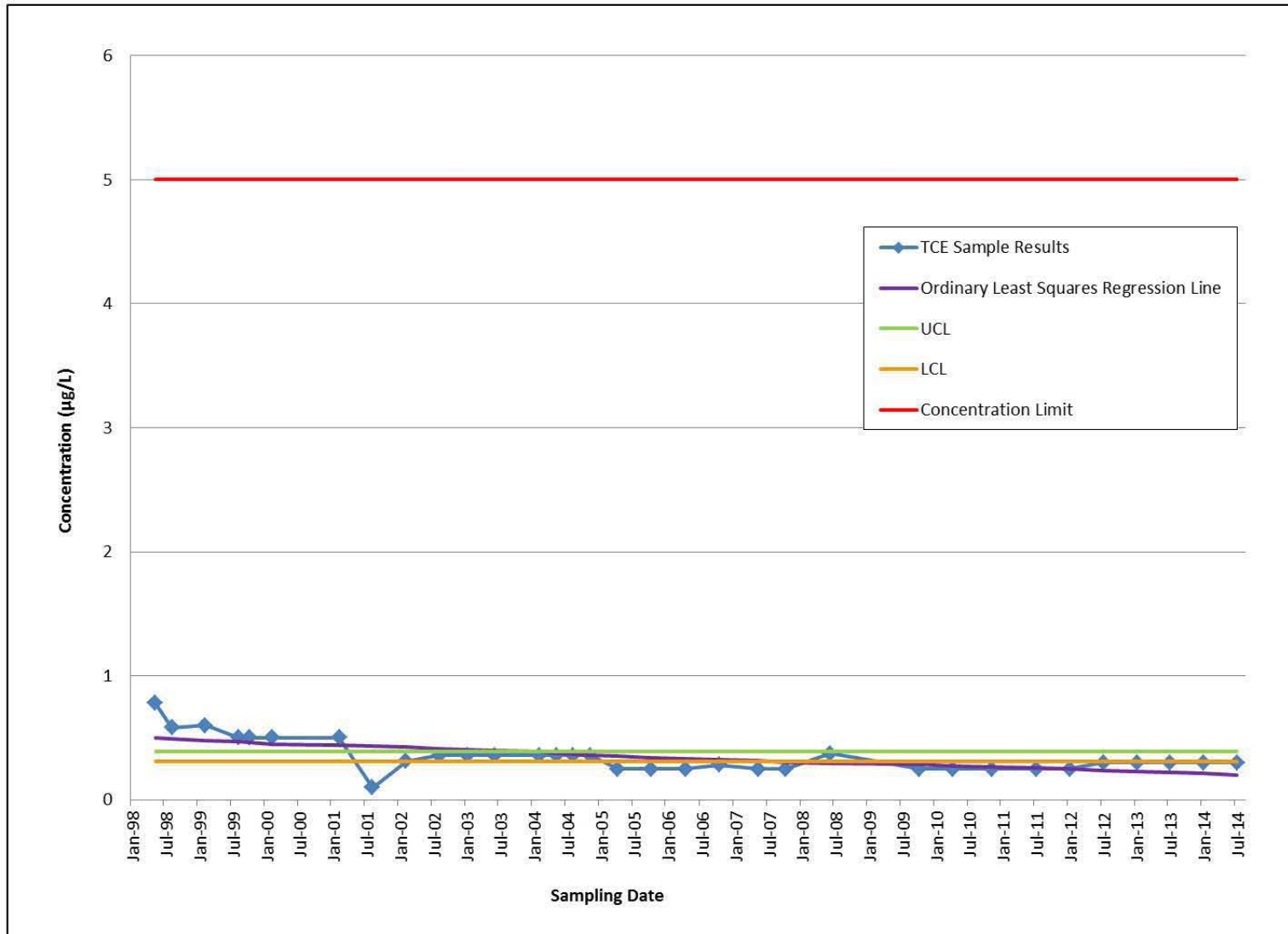


Figure 4-3
TCE Control Chart for CWL-BW5/4A



Figure 4-4
Nickel Control Chart for CWL-MW9

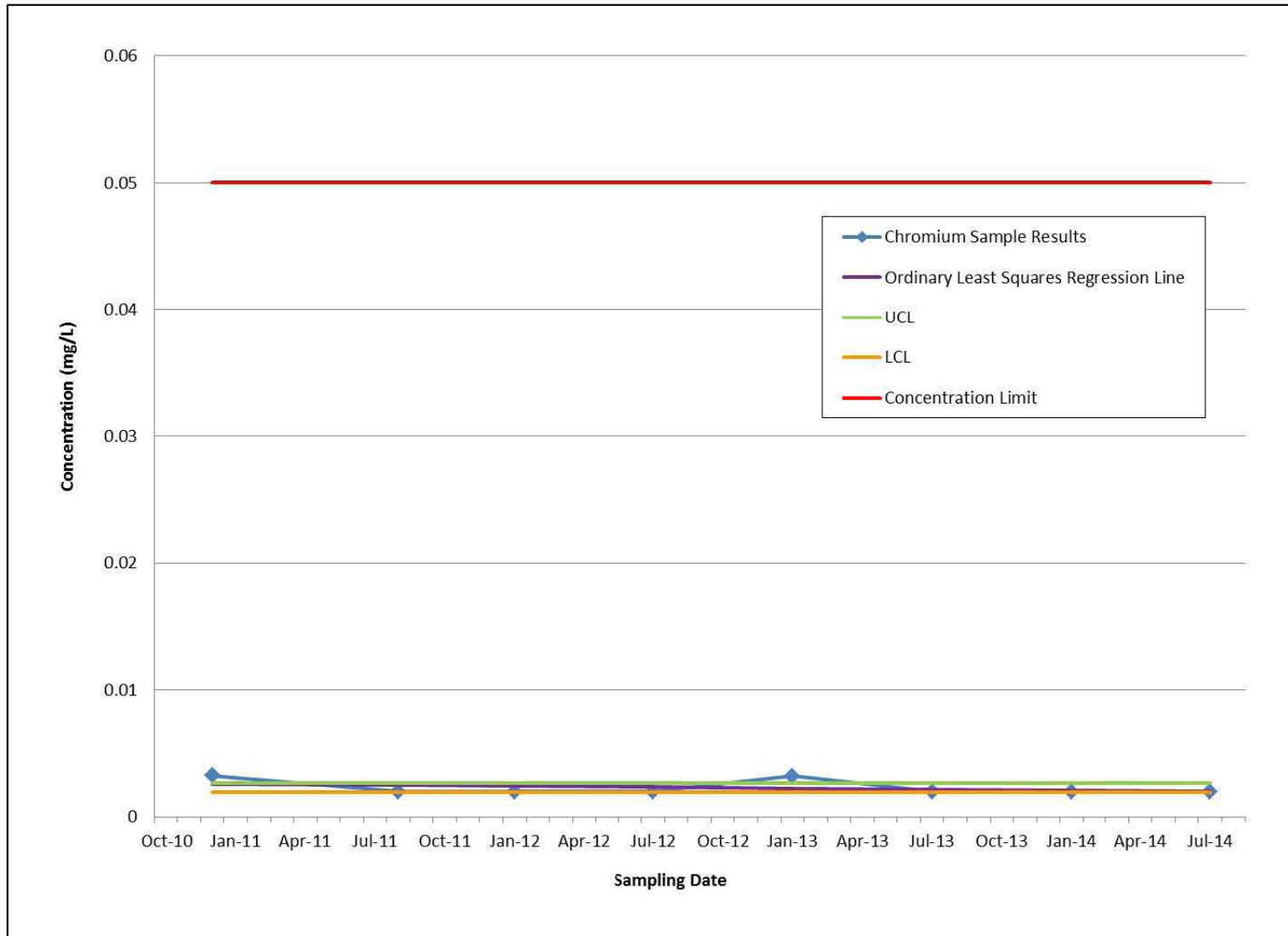


Figure 4-5
Chromium Control Chart for CWL-MW10

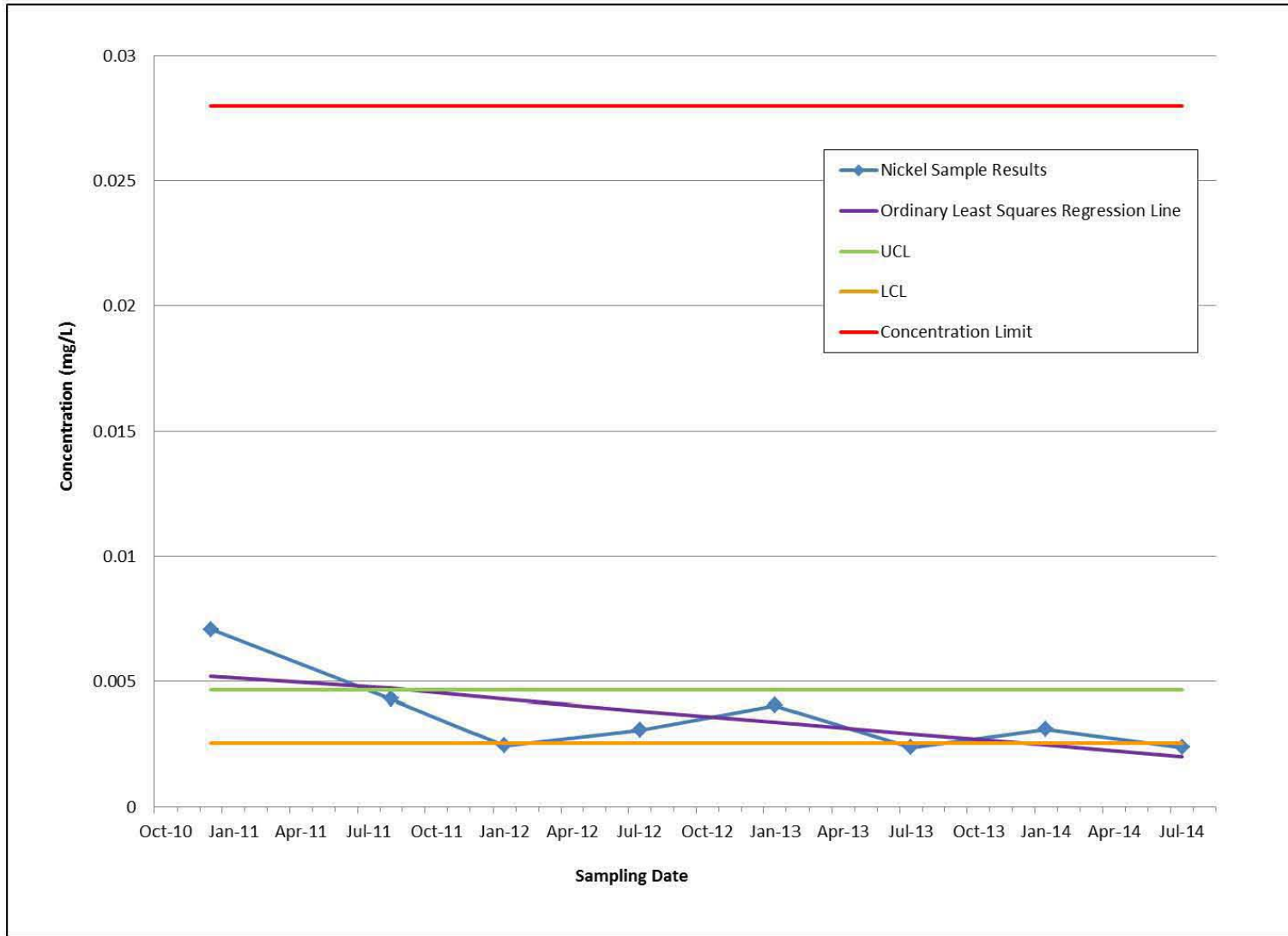


Figure 4-6
Nickel Control Chart for CWL-MW10

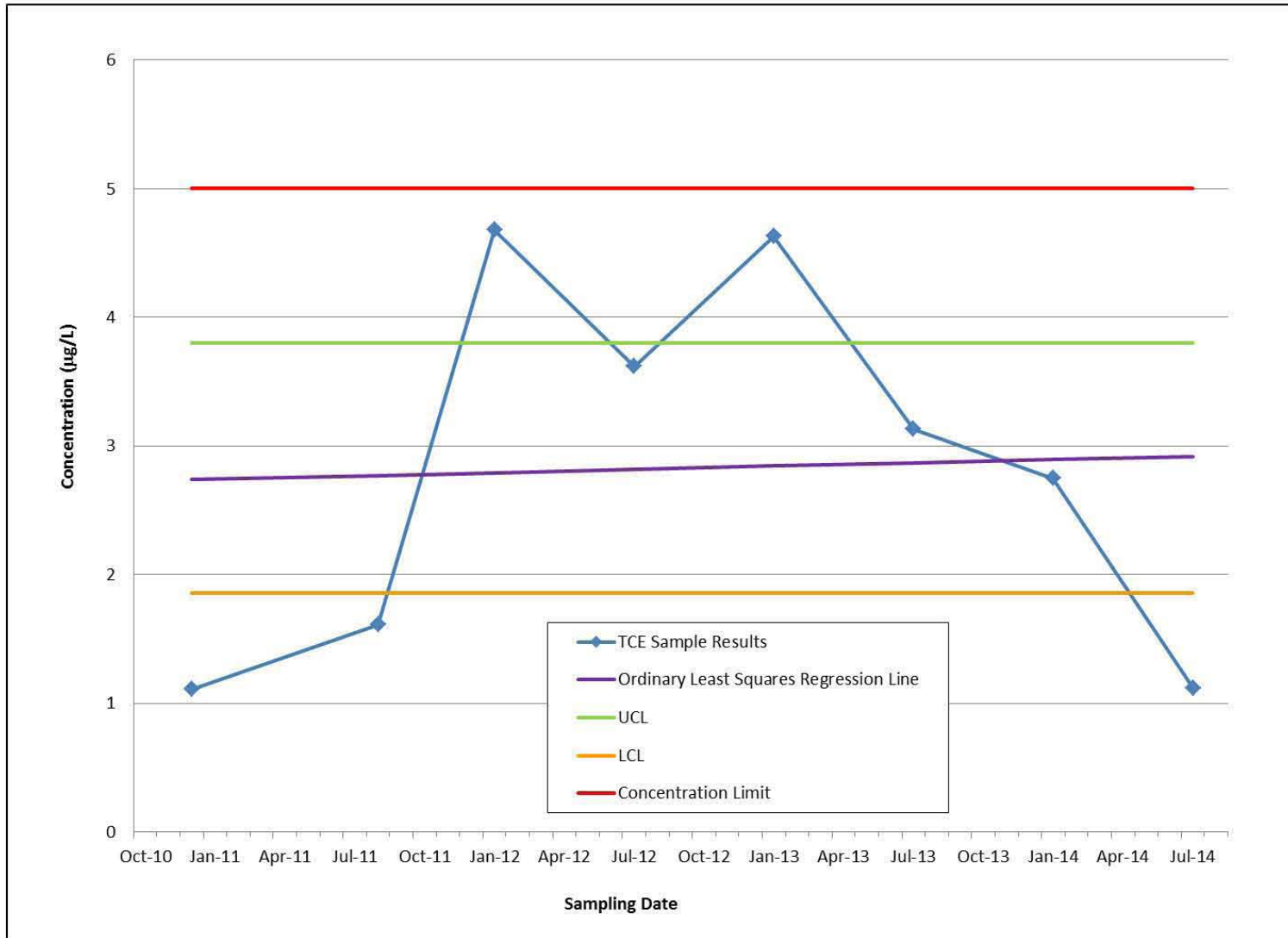


Figure 4-7
TCE Control Chart for CWL-MW10

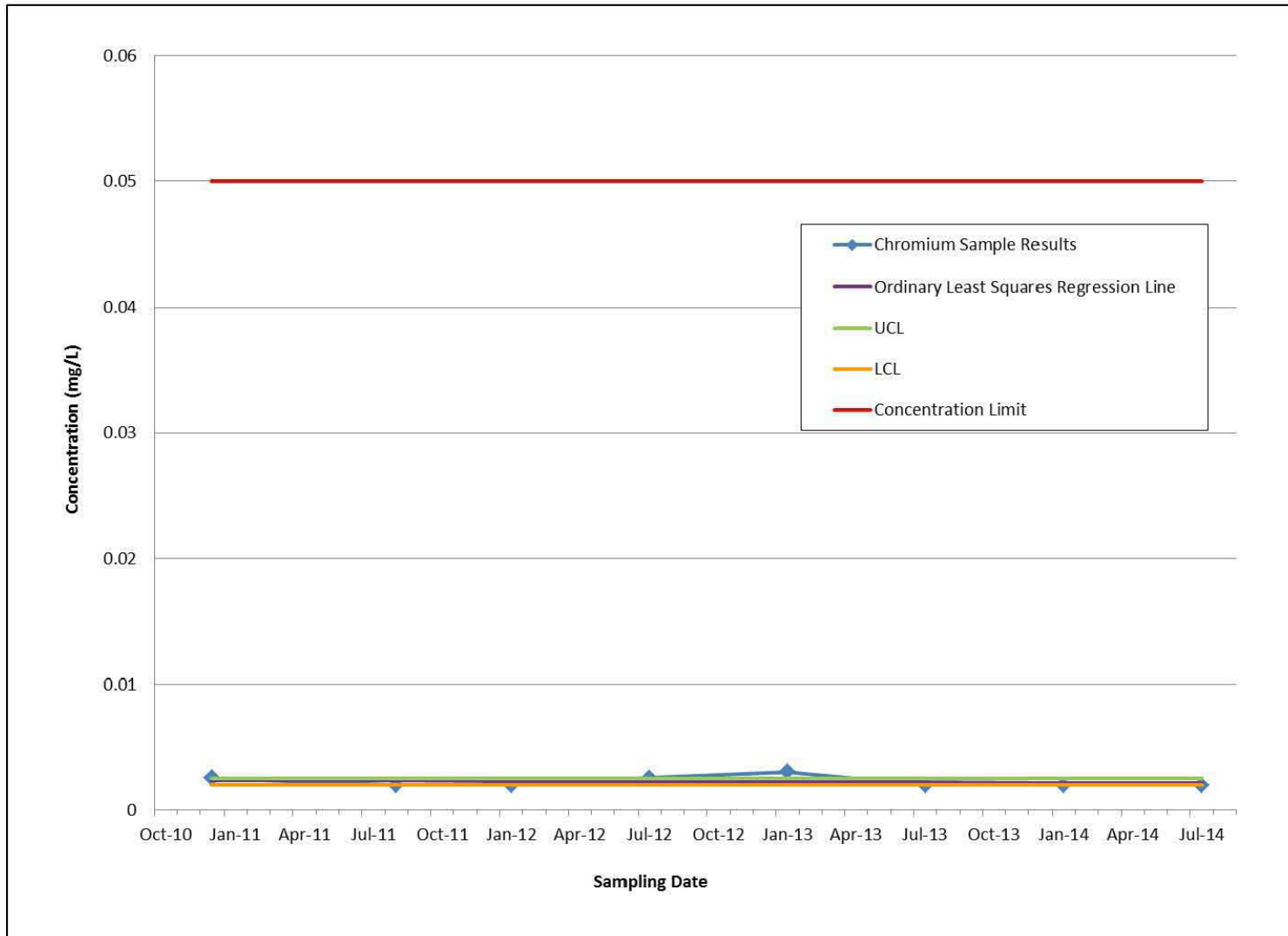


Figure 4-8
Chromium Control Chart for CWL-MW11

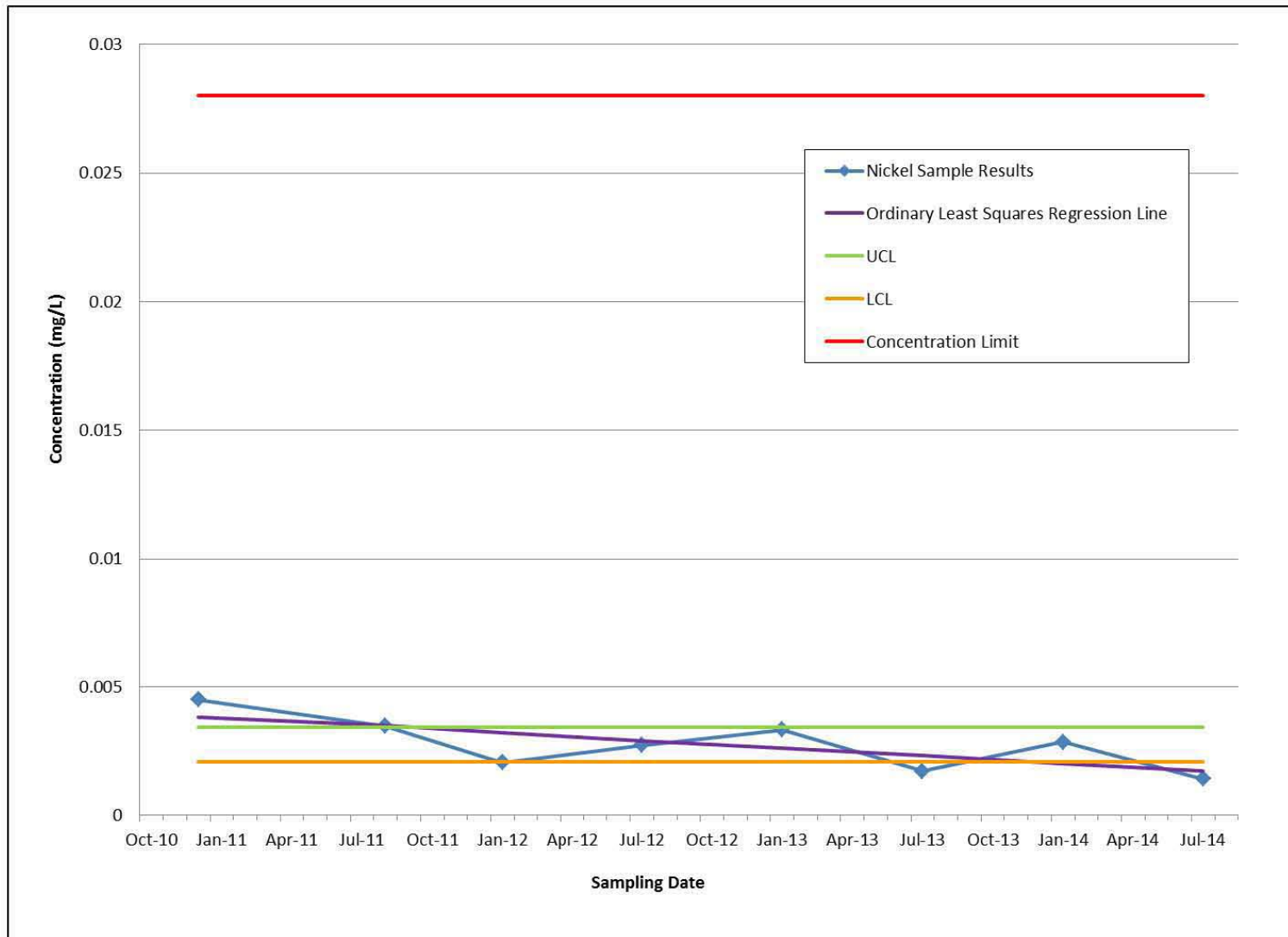


Figure 4-9
Nickel Control Chart for CWL-MW11

The statistical analysis of specific constituents was not performed if all results for the data set are non-detections. The statistical analysis presented for new wells CWL-MW9, CWL-MW10, and CWL-MW11 is significantly impacted by the small data set (each contains eight data points for each constituent), the very low concentrations, and in several cases the large number of non-detect results. Because the evaluation process uses the laboratory MDL in the case of laboratory non-detections, the statistical results are also affected by changes in the MDL over time. In general the laboratory MDLs have decreased over time, which impacts the CWL-BW5/4A statistical evaluation results as the historic data set for this well includes results from 1998 through the present. For laboratory detections that are qualified during the data validation process as “not detected” (i.e., “U” qualified) due to blank contamination, the original result reported by the laboratory is used. Results qualified by the laboratory and/or data validation as estimated (i.e., “J” qualified) are used as reported. Statistical results are presented below for all cases where evaluation was possible. As routine monitoring continues and the data sets increase in size, the evaluation results will improve for detected constituents.

Prediction Intervals

Monitoring Well CWL-BW5/4A

CY 2014 CWL-BW5 chromium and TCE sample results were all non-detections, and the corresponding MDLs were lower than their respective 95% LCLs, thus are below the prediction interval (range of 95% LCL to 95% UCL). This is due to the decrease in the laboratory detection limits over time and the fact that chromium and TCE are often not detected (only 13 chromium detections and 4 TCE detections out of 33 sampling events). Likewise, the CY 2014 results for nickel were slightly less than the 95% LCL, even though they were both low concentration detections. Results for all three hazardous constituents (using the MDL value for constituents not detected) fell within the historical range.

Monitoring Well CWL-MW9

Chromium and TCE have not been detected in any CWL-MW9 samples (CY 2010 through 2014, eight environmental and three duplicate samples). Therefore statistical evaluation of these constituents is not presented. All of the CY 2014 nickel results were detections above the laboratory MDL, were less than the 95% LCL, and were lower than the historical range (i.e., less than the minimum concentration from 2010 through 2013 results).

Monitoring Well CWL-MW10

CY 2014 CWL-MW10 chromium sample results were both non-detects, but the laboratory MDL (0.002 mg/L) fell within the range of the 95% LCL and 95% UCL. The nickel result for the January sample fell within the range of the 95% LCL and 95% UCL, but the July result was less than the 95% LCL. Similar to the nickel results, the January TCE result fell within the range of the 95% LCL and 95% UCL, but the July result was less than the 95% LCL. Results for chromium (using the MDL value), nickel, and TCE fell within the historical range.

Monitoring Well CWL-MW11

CY 2014 CWL-MW11 chromium sample results were both non-detects, but the laboratory MDL (0.002 mg/L) fell within the range of the 95% LCL and 95% UCL. The January nickel result fell within the range of the 95% LCL and 95% UCL, but the July result was below the 95% LCL. TCE has not been detected in any CWL-MW11 samples (CY 2010 through 2014, eight environmental and one duplicate sample). Therefore statistical evaluation of TCE is not presented. The chromium MDL values are equal to the historic minimum concentration. The January result for nickel falls within the historical range, but the July result is less than the historic minimum.

Confidence Intervals

Chromium, nickel, and TCE 95% LCLs and 95% UCLs of the mean are presented for each CWL monitoring well in Table 4-7 and are shown on the associated control charts (Figures 4-1 through 4-9). As previously explained, no statistical evaluation was performed for constituents that have not been detected in groundwater samples from monitoring wells CWL-MW9 (chromium and TCE) and CWL-MW11 (TCE). All calculated 95% LCLs are below the respective concentration limits; therefore there are no exceedances of any concentration limits.

Median Test

The cumulative percentage of sample results greater than the median (i.e., Median Test) for the three hazardous constituents is below 80% for all detected constituents at all four monitoring wells. Therefore, there is no statistically significant evidence of increasing contamination for any of the hazardous constituents. The highest Median Test result was 47% for nickel (CWL-BW5/4A); both CY 2014 results were less than the 95% LCL of the mean. The low median test results for TCE in CWL-BW5/4A (3%) reflects 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 regression line is shown on Figures 4-1 through 4-9. This line provides a visual representation of the overall trend of the sample results. As shown in Figures 4-1 through 4-9, all three hazardous constituents show a slight decreasing trend, consistent with the Median Test results. Despite the fluctuations shown in Figure 4-7 resulting from higher TCE concentrations in the 2012 and January 2013 samples from CWL-MW10, there is no statistically significant evidence of increasing contamination as indicated by the Median Test. The last three TCE results from CWL-MW10 samples (July 2013, January 2014, and July 2014) have shown consistent decreases. The variation shown in Figure 4-7 is typical of very low concentrations (low parts per billion) that are fluctuating over time.

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 in 1985. The average rate of decline has been somewhat variable over time, but is typically in the range of 0.4 to 0.8 feet per year. The groundwater elevation decline between October 2013 and October 2014 ranged from 0.38 (CWL-MW11) to 0.85 (CWL-BW5) feet, with an average decline rate of 0.64 feet.

In CY2014, water levels were measured in the groundwater monitoring wells on a quarterly basis, and also during the January and July sampling events. Figure 4-10 depicts the potentiometric surface map of the regional aquifer beneath the CWL based upon the October 2014 water-level measurements. The westward deflection of the potentiometric surface is a localized salient in the potentiometric surface of the regional aquifer. Based on this figure, the local groundwater flow direction varies across the site. However, the overall groundwater flow direction is generally westward in the CWL vicinity, which is consistent with the hydrogeologic conceptual model for the KAFB area (SNL/NM June 2014b). Localized variations in the water table reflect site-specific geologic controls (i.e., vertical and lateral variability in permeability of the saturated Santa Fe Group alluvial sediments). Measured orthogonally from the potentiometric surface contours on Figure 4-10, the horizontal gradient did not change from CY 2013 and is 0.011 feet/feet.

Groundwater velocities were calculated using (a) the current potentiometric surface gradient, (b) the hydraulic conductivity range from the four groundwater monitoring wells (i.e., high and low values from the 2012 slug tests), and (c) a porosity of 29 percent as determined from the laboratory analyses of CWL soil samples (SNL/NM October 1995). The calculated velocities were identical to those reported for CY 2013, and range from approximately 1.8×10^{-4} to 2.8×10^{-3} feet per day (equivalent to 6.3×10^{-8} to 1.0×10^{-6} centimeters per second). The average groundwater velocity is 1×10^{-3} feet per day (equivalent to 4.1×10^{-7} centimeters per second). These very low values are consistent with previous estimates for horizontal groundwater flow at the water table in the CWL vicinity.

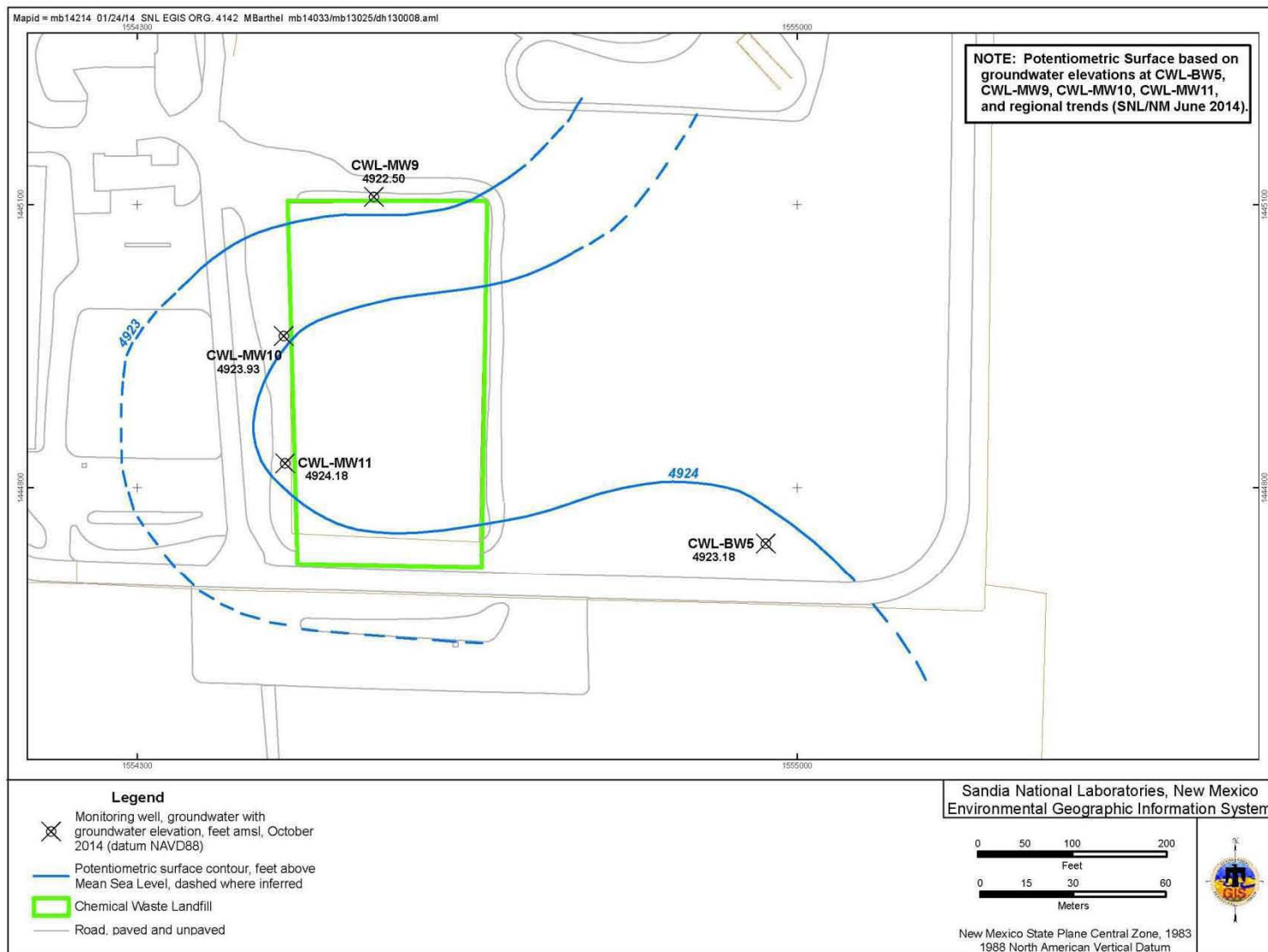


Figure 4-10
 Potentiometric Surface of the Regional Aquifer at the Chemical Waste Landfill, October 2014

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 2014 in accordance with PCCP Attachment 1, Sections 1.8 and 1.12, and Attachment 3 (NMED October 2009 and subsequent revisions). The CY 2014 annual soil-gas sampling event was the third 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.

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 determine 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-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3 on January 16, 2014. All samples were analyzed using the EPA Method TO-15 (EPA January 1999) for the 50 VOCs listed in PCCP Attachment 1, Table 1-5. CY 2014 soil-gas sampling activities and results 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. Purging continued after meeting the minimum requirement of three tubing volumes 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 as many as 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. A total of two duplicate samples were submitted for analysis with CY 2014 environmental samples. These sample results are used to evaluate the reproducibility of the sampling and analytical processes.

Field 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 five field blank samples were submitted for analysis with CY 2014 environmental samples.

5.1.3 Waste Management

Only a small volume of solid waste (personal protective equipment) was generated during the two soil-gas monitoring events. This waste was combined with the groundwater monitoring solid waste and managed as hazardous waste. The 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. for chemical analyses by EPA Method TO-15 (EPA January 1999b) in accordance with PCCP Attachment 1, Section 1.8. Analytical reports (i.e., certificates of analyses), analytical methods, MDLs, reporting limits (RLs), dates of analyses, results of field and laboratory 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

This section summarizes detected VOCs from soil-gas samples collected in January 2014. The January 2014 results are presented in Table 5-1.

In general the 2014 detected VOCs were consistent with the 2013 data set. A total of 33 compounds were detected in the samples collected from the 21 sampling ports. The large number of compounds detected is related to the very low detection limits associated with EPA Method TO-15. The most commonly detected compounds include chloroform (22 detections), 1,1-dichloroethene (1,1-DCE) (22 detections), methylene chloride (22 detections), tetrachlorethene (PCE) (23 detections), 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113) (23 detections), TCE (23 detections), and trichlorofluoromethane (Freon 11) (23 detections).

Table 5-1
 Summary of Detected Volatile Organic Compounds
 Chemical Waste Landfill Soil-Gas Monitoring
 Analytical Method TO-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-UI1-40 16-Jan-14	Acetone	970	57	1600	J	1600U
	Chloroform	750	31	98	--	--
	1,1-Dichloroethene	180	42	260	J	--
	Ethylbenzene	61	21	130	J	130U
	Methylene chloride	47	24	130	J	--
	Tetrachloroethene	2800	17	130	--	--
	Toluene	310	17	130	--	310U
	Trichloroethene	4800	34	130	--	--
	Trichlorofluoromethane	180	64	130	--	--
	1,1,1-Trichloroethane	56	21	98	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	730	53	130	--	--
	m,p-Xylene	260	33	260	--	260U
	o-Xylene	110	18	130	J	130U
	Total Organics	9543	NA	NA	NA	NA
CWL-UI1-80 16-Jan-14	Acetone	980	59	1700	J	1700U
	Chloroform	580	31	99	--	--
	1,2-Dichloroethane	39	29	260	J	--
	1,1-Dichloroethene	320	43	260	--	--
	Ethylbenzene	54	21	130	J	130U
	Methylene chloride	110	24	130	J	--
	Tetrachloroethene	950	17	130	--	--
	Toluene	280	17	130	--	280U
	Trichloroethene	6300	35	130	--	--
	Trichlorofluoromethane	210	65	130	--	--
	1,1,1-Trichloroethane	52	22	99	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	870	54	130	--	--
	m,p-Xylene	240	33	260	J	260U
	o-Xylene	83	18	130	J	130U
Total Organics	9431	NA	NA	NA	NA	

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-UI1-120 16-Jan-14	Acetone	900	59	1700	J	1700U
	Chloroform	450	32	100	--	--
	1,2-Dichloroethane	69	29	270	J	--
	1,1-Dichloroethane	420	43	270	--	--
	Ethylbenzene	60	21	130	J	130U
	Methylene chloride	240	24	130	--	--
	Styrene	27	20	130	J	--
	Tetrachloroethene	670	17	130	--	--
	Toluene	320	17	130	--	320U
	Trichloroethene	7600	35	130	--	--
	Trichlorofluoromethane	240	65	130	--	--
	1,1,1-Trichloroethane	55	22	100	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	54	130	--	--
	m,p-Xylene	260	33	270	J	270U
	o-Xylene	84	18	130	J	130U
Total Organics	10771	NA	NA	NA	NA	
CWL-UI1-120 (Duplicate) 16-Jan-14	Acetone	7.3	4.6	130	J	130U
	Benzene	6.0	2.0	10	J	--
	Carbon tetrachloride	25	1.6	20	--	--
	Chloroform	490	2.4	7.7	--	--
	1,2-Dibromoethane	7.9	1.9	20	J	--
	1,2-Dichlorobenzene	12	3.3	10	--	--
	Dichlorodifluoromethane	46	3.7	10	--	--
	1,1-Dichloroethane	18	1.8	7.7	--	--
	1,2-Dichloroethane	38	2.3	20	--	--
	1,1-Dichloroethene	490	3.3	20	--	--
	1,2-Dichloropropane	84	6.1	10	--	--
	Methylene chloride	230	1.8	10	--	--
	Tetrachloroethene	790	1.3	10	--	--
	Toluene	8.0	1.3	10	J	10U
	Trichloroethene	7600	34	130	--	--
	Trichlorofluoromethane	300	5.0	10	--	--
	1,1,1-Trichloroethane	57	1.7	7.7	--	--
	1,1,2-Trichloroethane	7.0	1.7	10	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	4.2	10	--	--
o-Xylene	4.2	1.4	10	J	130U	
Total Organics	11200.9	NA	NA	NA	NA	

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-UI2-36 16-Jan-14	Acetone	280	15	430	J	430U
	Chloroform	510	31	98	--	--
	Ethylbenzene	55	20	130	J	--
	Methylene chloride	50	23	130	J	--
	Tetrachloroethene	130	17	130	--	--
	Toluene	280	17	130	--	--
	Trichloroethene	2800	34	130	--	--
	Trichlorofluoromethane	130	64	130	--	--
	1,1,1-Trichloroethane	33	21	98	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	480	53	130	--	--
	m,p-Xylene	250	33	260	J	--
	o-Xylene	87	18	130	J	--
	Total Organics	4805	NA	NA	NA	NA
	CWL-UI2-76 16-Jan-14	Acetone	300	17	490	J
Chloroform		520	29	92	--	--
1,2-Dichloroethane		33	27	240	J	--
1,1-Dichloroethene		91	39	240	J	--
Ethylbenzene		57	19	120	J	--
Methylene chloride		42	22	120	J	--
Styrene		23	18	120	J	--
Tetrachloroethene		140	16	120	--	--
Toluene		310	16	120	--	--
Trichloroethene		3700	32	120	--	--
Trichlorofluoromethane		150	60	120	--	--
1,1,1-Trichloroethane		28	20	92	J	--
1,1,2-Trichloro-1,2,2-trifluoroethane		610	50	120	--	--
m,p-Xylene		250	31	240	--	--
o-Xylene		82	17	120	J	--
Total Organics	6036	NA	NA	NA	NA	

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-UI2-136 16-Jan-14	Acetone	960	58	1600	J	1600U
	Carbon tetrachloride	25	21	260	J	--
	Chloroform	570	31	98	--	--
	1,2-Dichloroethane	44	29	260	J	--
	1,1-Dichloroethene	190	42	260	J	--
	1,2-Dichloropropane	140	78	130	--	--
	Ethylbenzene	59	20	130	J	--
	Methylene chloride	55	23	130	J	--
	Tetrachloroethene	190	17	130	--	--
	Toluene	310	17	130	--	--
	Trichloroethene	6200	34	130	--	--
	Trichlorofluoromethane	220	64	130	--	--
	1,1,1-Trichloroethane	35	21	98	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	930	53	130	--	--
	m,p-Xylene	260	33	260	--	--
	o-Xylene	86	18	130	J	--
Total Organics	9314	NA	NA	NA	NA	
CWL-UI2-136 (Duplicate) 16-Jan-14	Acetone	870	57	1600	J	1600U
	Carbon tetrachloride	22	21	260	J	--
	Chloroform	540	31	97	--	--
	1,2-Dichloroethane	49	28	260	J	--
	1,1-Dichloroethene	190	42	260	J	--
	1,2-Dichloropropane	140	77	130	--	--
	Ethylbenzene	69	20	130	J	--
	Methylene chloride	53	23	130	J	--
	Styrene	26	19	130	J	--
	Tetrachloroethene	170	16	130	--	--
	Toluene	350	16	130	--	--
	Trichloroethene	5900	34	130	--	--
	Trichlorofluoromethane	220	63	130	--	--
	1,1,1-Trichloroethane	33	21	97	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	900	52	130	--	--
	m,p-Xylene	290	32	260	--	--
o-Xylene	98	17	130	J	--	
Total Organics	9050	NA	NA	NA	NA	

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D1-100 16-Jan-14	Acetone	870	56	1600	J	1600U
	Chloroform	540	30	94	--	--
	1,2-Dichloroethane	61	28	250	J	--
	1,1,1-Dichloroethane	440	41	250	--	--
	1,2-Dichloropropane	95	75	130	J	--
	Ethylbenzene	64	20	130	J	--
	Methylene chloride	48	23	130	J	--
	Tetrachloroethene	740	16	130	--	--
	Toluene	340	16	130	--	--
	Trichloroethene	9900	33	130	--	--
	Trichlorofluoromethane	300	62	130	--	--
	1,1,1-Trichloroethane	58	20	94	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	51	130	--	--
	m,p-Xylene	280	31	250	--	--
	o-Xylene	82	17	130	J	--
Total Organics	14248	NA	NA	NA	NA	
CWL-D1-160 16-Jan-14	Acetone	750	84	2400	J	2400U
	Chloroform	490	45	140	--	--
	1,2-Dichloroethane	73	41	380	J	--
	1,1,1-Dichloroethane	770	61	380	--	--
	1,2-Dichloropropane	160	110	190	J	--
	Ethylbenzene	67	30	190	J	--
	Methylene chloride	67	34	190	J	--
	Tetrachloroethene	560	24	190	--	--
	Toluene	330	24	190	--	--
	Trichloroethene	16000	49	190	--	--
	Trichlorofluoromethane	470	92	190	--	--
	1,1,1-Trichloroethane	71	31	140	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	2000	77	190	--	--
	m,p-Xylene	300	47	380	J	--
	o-Xylene	92	25	190	J	--
Total Organics	21450	NA	NA	NA	NA	

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D1-240 16-Jan-14	Acetone	870	79	2200	J	2200U
	Carbon tetrachloride	65	28	350	J	--
	Chloroform	450	42	130	--	--
	Dichlorodifluoromethane	72	64	180	J	--
	1,1-Dichloroethane	33	32	130	J	--
	1,2-Dichloroethane	72	39	350	J	--
	1,1-Dichloroethene	970	57	350	--	--
	1,2-Dichloropropane	180	110	180	--	--
	Ethylbenzene	72	28	180	J	--
	Methylene chloride	56	32	180	J	--
	Tetrachloroethene	470	23	180	--	--
	Toluene	380	23	180	--	--
	Trichloroethene	19000	47	180	--	--
	Trichlorofluoromethane	530	87	180	--	--
	1,1,1-Trichloroethane	66	29	130	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	2500	72	180	--	--
	m,p-Xylene	310	44	350	J	--
	o-Xylene	90	24	180	J	--
	Total Organics	25316	NA	NA	NA	NA
CWL-D1-350 16-Jan-14	Acetone	1200	39	1100	--	1200U
	1,1-Dichloroethene	510	57	350	--	--
	Ethylbenzene	61	28	180	J	--
	Methylene chloride	61	32	180	J	--
	Tetrachloroethene	220	23	180	--	--
	Toluene	310	23	180	--	--
	Trichloroethene	8500	46	180	--	--
	Trichlorofluoromethane	300	87	180	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	72	180	--	--
	m,p-Xylene	270	44	350	J	--
	o-Xylene	81	24	180	J	--
	Total Organics	11613	NA	NA	NA	NA

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D1-470 16-Jan-14	Acetone	5.4	0.79	22	J	22U
	Carbon tetrachloride	1.5	0.86	11	J	--
	Chloroform	1.5	1.3	4.0	J	--
	Dichlorodifluoromethane	8.7	1.9	5.4	--	--
	1,1-Dichloroethene	22	1.7	11	--	--
	Methylene chloride	4.4	0.96	5.4	J	--
	Tetrachloroethene	5.0	0.68	5.4	J	--
	Trichloroethene	160	1.4	5.4	--	--
	Trichlorofluoromethane	39	2.6	5.4	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	150	2.2	5.4	--	--
	Total Organics	392.1	NA	NA	NA	NA
CWL-D2-120 16-Jan-14	Acetone	400	58	1600	J	--
	2-Butanone	65	64	260	J	--
	Chloroform	650	31	97	--	--
	Dichlorodifluoromethane	49	47	130	J	--
	1,2-Dichloroethane	95	29	260	J	--
	1,1-Dichloroethene	560	42	260	--	--
	1,2-Dichloropropane	210	78	130	--	--
	Ethylbenzene	74	20	130	J	--
	Methylene chloride	57	23	130	J	--
	Tetrachloroethene	530	17	130	--	--
	Toluene	350	17	130	--	--
	Trichloroethene	13000	34	130	--	--
	Trichlorofluoromethane	380	64	130	--	--
	1,1,1-Trichloroethane	65	21	97	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1600	53	130	--	--
	m,p-Xylene	310	32	260	--	--
	o-Xylene	96	17	130	J	--
Total Organics	18491	NA	NA	NA	NA	

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D2-240 16-Jan-14	Acetone	370	49	1400	J	--
	Carbon tetrachloride	53	21	260	J	--
	Chloroform	630	31	98	--	--
	Dichlorodifluoromethane	64	48	130	J	--
	1,1-Dichloroethane	32	24	98	J	--
	1,2-Dichloroethane	80	29	260	J	--
	1,1-Dichloroethene	760	42	260	--	--
	1,2-Dichloropropane	290	79	130	--	--
	Ethylbenzene	61	21	130	J	--
	Methylene chloride	78	24	130	J	--
	Tetrachloroethene	510	17	130	--	--
	Toluene	290	17	130	--	--
	Trichloroethene	16000	34	130	--	--
	Trichlorofluoromethane	470	64	130	--	--
	1,1,1-Trichloroethane	63	21	98	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	2000	53	130	--	--
	m,p-Xylene	270	33	260	--	--
	o-Xylene	93	18	130	J	--
Total Organics		22114	NA	NA	NA	NA

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D2-350 16-Jan-14	Acetone	1300	57	1600	J	--
	2-Butanone	100	64	260	J	--
	Chloroform	360	30	96	--	--
	Dichlorodifluoromethane	50	46	130	J	--
	1,2-Dichloroethane	75	28	260	J	--
	1,1-Dichloroethene	540	41	260	--	--
	1,2-Dichloropropane	130	77	130	--	--
	Ethylbenzene	100	20	130	J	--
	4-Methyl-2-pentanone	49	43	130	J	--
	Methylene chloride	90	23	130	J	--
	Styrene	46	19	130	J	--
	Tetrachloroethene	340	16	130	--	--
	Toluene	490	16	130	--	--
	Trichloroethene	9900	34	130	--	--
	Trichlorofluoromethane	350	63	130	--	--
	1,1,1-Trichloroethane	43	21	96	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1500	52	130	--	--
	m,p-Xylene	440	32	260	--	--
	o-Xylene	140	17	130	--	--
Total Organics	16043	NA	NA	NA	NA	
CWL-D2-440 16-Jan-14	Acetone	36	1.1	31	--	--
	2-Butanone	5.0	1.2	5.0	--	--
	Carbon tetrachloride	0.44	0.40	5.0	J	--
	Chloroform	4.5	0.59	1.9	--	--
	Dichlorodifluoromethane	0.98	0.91	2.5	J	--
	1,1-Dichloroethene	7.5	0.81	5.0	--	--
	Tetrachloroethene	4.7	0.32	2.5	--	--
	Trichloroethene	140	0.66	2.5	--	--
	Trichlorofluoromethane	4.5	1.2	2.5	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	13	1.0	2.5	--	--
	Total Organics	216.6	NA	NA	NA	NA

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D2-470 16-Jan-14	Acetone	1600	23	650	--	--
	Benzene	19	10	52	J	--
	Benzyl chloride	22	21	100	J	--
	2-Butanone	140	26	100	--	--
	Chloroform	330	12	39	--	--
	1,2-Dichlorobenzene	24	17	52	J	--
	1,3-Dichlorobenzene	21	14	52	J	--
	1,4-Dichlorobenzene	23	19	52	J	--
	Dichlorodifluoromethane	23	19	52	J	--
	1,1-Dichloroethane	12	9.4	39	J	--
	1,2-Dichloroethane	82	11	100	J	--
	1,1-Dichloroethene	200	17	100	--	--
	1,2-Dichloropropane	80	31	52	--	--
	Ethylbenzene	120	8.2	52	--	--
	4-Ethyltoluene	32	24	52	J	--
	2-Hexanone	38	11	52	J	--
	4-Methyl-2-pentanone	41	18	52	J	--
	Methylene chloride	48	9.4	52	J	--
	Styrene	55	7.7	52	--	--
	Tetrachloroethene	260	6.6	52	--	--
	Toluene	620	6.6	52	--	--
	Trichloroethene	4700	14	52	--	--
	Trichlorofluoromethane	160	25	52	--	--
	1,2,4-Trichlorobenzene	89	56	260	J	--
	1,1,1-Trichloroethane	40	8.5	39	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	600	21	52	--	--
	1,2,4-Trimethylbenzene	44	21	100	J	--
	1,3,5-Trimethylbenzene	23	16	52	J	--
	m,p-Xylene	530	13	100	--	--
	o-Xylene	160	7.0	52	--	--
Total Organics	10136	NA	NA	NA	NA	

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D3-120 16-Jan-14	Acetone	1400	29	820	--	1400U
	Benzene	15	13	66	J	--
	2-Butanone	110	33	130	J	--
	Chloroform	160	16	49	--	--
	1,2-Dichloroethane	70	14	130	J	--
	1,1-Dichloroethene	200	21	130	--	--
	1,2-Dichloropropane	90	39	66	--	--
	Ethylbenzene	90	10	66	--	--
	Methylene chloride	54	12	66	J	--
	Styrene	45	9.7	66	J	--
	Tetrachloroethene	99	8.4	66	--	--
	Toluene	460	8.4	66	--	--
	Trichloroethene	4100	17	66	--	--
	Trichlorofluoromethane	160	32	66	--	--
	1,1,1-Trichloroethane	16	11	49	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	630	27	66	--	--
	1,2,4-Trimethylbenzene	30	27	130	J	--
	m,p-Xylene	440	16	130	--	--
	o-Xylene	150	8.9	66	--	--
	Total Organics	6919	NA	NA	NA	NA

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D3-170 16-Jan-14	Acetone	1400	29	810	--	1400U
	Benzene	19	13	64	J	--
	2-Butanone	120	32	130	J	--
	Chloroform	160	15	48	--	--
	Dichlorodifluoromethane	28	23	64	J	64U
	1,2-Dichloroethane	94	14	130	J	--
	1,1-Dichloroethene	260	21	130	--	--
	1,2-Dichloropropane	120	39	64	--	--
	Ethylbenzene	120	10	64	--	--
	4-Methyl-2-pentanone	35	22	64	J	--
	Methylene chloride	51	12	64	J	--
	Tetrachloroethene	110	8.2	64	--	--
	Toluene	640	8.2	64	--	--
	Trichloroethene	5400	17	64	--	--
	Trichlorofluoromethane	200	32	64	--	--
	1,1,1-Trichloroethane	17	10	48	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	800	26	64	--	--
	m,p-Xylene	530	16	130	--	--
	o-Xylene	150	8.7	64	--	--
	Total Organics	8826	NA	NA	NA	NA
CWL-D3-350 16-Jan-14	Acetone	1100	58	1600	J	1600U
	2-Butanone	85	64	260	J	--
	Chloroform	140	31	97	--	--
	1,2-Dichloroethane	52	29	260	J	--
	1,1-Dichloroethene	270	42	260	--	--
	1,2-Dichloropropane	99	78	130	J	--
	Ethylbenzene	89	20	130	J	--
	Methylene chloride	340	23	130	--	--
	Styrene	61	19	130	J	--
	Tetrachloroethene	97	17	130	J	--
	Toluene	1100	17	130	--	--
	Trichloroethene	5300	34	130	--	--
	Trichlorofluoromethane	210	64	130	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	840	53	130	--	--
	m,p-Xylene	340	32	260	--	--
	o-Xylene	98	17	130	J	--
	Total Organics	9121	NA	NA	NA	NA

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-15^a
 Calendar Year 2014

Well ID/Sample Port	Analyte	Result (ppbv)	MDL (ppbv)	RL (ppbv)	Laboratory Qualifier ^b	Validation Qualifier ^b
CWL-D3-440 16-Jan-14	Acetone	1400	58	1600	J	1600U
	2-Butanone	100	65	260	J	--
	Carbon tetrachloride	30	21	260	J	--
	Chloroform	230	31	98	--	--
	1,2-Dichloroethane	97	29	260	J	--
	1,1-Dichloroethene	400	42	260	--	--
	1,2-Dichloropropane	190	79	130	--	--
	Ethylbenzene	97	21	130	J	--
	Methylene chloride	330	24	330	--	--
	Tetrachloroethene	150	17	130	--	--
	Toluene	570	17	130	--	--
	Trichloroethene	8200	34	130	--	--
	Trichlorofluoromethane	310	64	130	--	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	53	130	--	--
	m,p-Xylene	460	33	260	--	--
	o-Xylene	140	18	130	--	--
	Total Organics	12604	NA	NA	NA	NA
CWL-D3-480 16-Jan-14	Acetone	7.4	0.18	5.0	--	7.4U
	Benzene	0.15	0.079	0.40	J	--
	2-Butanone	1.6	0.20	0.80	--	--
	Carbon tetrachloride	0.18	0.064	0.80	J	--
	Chloroform	1.4	0.095	0.30	--	--
	Dichlorodifluoromethane	0.57	0.15	0.40	--	0.57U
	1,2-Dichloroethane	0.13	0.088	0.80	J	--
	1,1-Dichloroethene	1.5	0.13	0.80	--	--
	1,2-Dichloropropane	0.68	0.24	0.40	--	--
	2-Hexanone	0.20	0.087	0.40	J	--
	Methylene chloride	1.3	0.072	0.40	--	--
	Tetrachloroethene	0.90	0.051	0.40	--	--
	Toluene	0.18	0.051	0.40	J	--
	Trichloroethene	35	0.11	0.40	--	--
	Trichlorofluoromethane	1.3	0.20	0.40	--	--
	1,1,1-Trichloroethane	0.12	0.065	0.30	J	--
	1,1,2-Trichloro-1,2,2-trifluoroethane	4.2	0.16	0.40	--	--
Total Organics	48.84	NA	NA	NA	NA	

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-15^a
Calendar Year 2014

Notes:

^aAnalytical Method EPA 1999, "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-15" Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.

^bLaboratory/Validation Qualifier - Blank (--) cell = all quality control samples met acceptance criteria. "J" and "U," see below.

^cTotal Organics -- sum of validated detected organic compounds.

^dDetected value >500 ppbv threshold concentration that applies only to deepest well ports at CWL-D1, CWL-D2, and CWL-D3. Statistical evaluation 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.

U = Analyte not present or concentration is below the method detection limit.

Other commonly detected VOCs included 1,2-dichloropropane (15 detections), ethyl benzene (16 detections), 1,2-dichloroethane (18 detections), 1,1,1-trichloroethane (18 detections), toluene (17 detections), m, p-xylene (16 detections), and o-xylene (16 detections). Acetone was detected 23 times, but 18 of these detections were qualified as non-detections based on data validation review (i.e., field blank contamination, see section 5.2.2).

Similar to the 2013 results, TCE was the most frequently detected VOC and had the highest VOC concentrations. TCE was detected in all January samples at concentrations ranging from 0.035 parts per million by volume (ppmv) at CWL-D3 (480 foot bgs sample port) to 19 ppmv at CWL-D1 (240 foot bgs sample port). In addition, 1,1,2-trichloro-1,2,2-trifluoroethane; trichlorofluoromethane; and PCE were detected in all samples at lower concentrations. Chloroform and 1,1-dichloroethene were detected in all samples except for CWL-D1-350 and CWL-UI1-36, respectively.

The maximum soil-gas concentration from the three deepest sampling ports (CWL-D1-470, CWL-D2-470, CWL-D3-480) was TCE at a concentration of 4.7 ppmv (CWL-D2-470). Only five VOCs exceeded 0.5 ppmv at the three deepest sampling ports and all of these detections were from CWL-D2-470. The five VOCs included acetone (1.6 ppmv), toluene (0.62 ppmv), trichloroethene (4.7 ppmv), 1,1,2-trichloro-1,2,2-trifluoroethane (0.6 ppmv), and m,p-xylene (0.53 ppmv).

5.2.2 Field Quality Control Sample Results

Table 5-2 presents field duplicate results for samples collected from wells CWL-UI1-120 and CWL-UI2-136 in January. RPD calculations were performed for all detected compounds with concentrations exceeding five times the analytical laboratory reporting limit in both the environmental and duplicate sample. If a detected compound in one sample was not detected in the corresponding duplicate or environmental sample, no RPD was calculated. The duplicate sample results show good agreement in both sample sets, with all RPDs less than 50%.

In the five field blank samples, acetone was detected four times and the following VOCs were detected one time each: 2-butanone, dichlorodifluoromethane, ethylbenzene, toluene, TCE, m,p-Xylene, and o-Xylene. All detections in the field blank samples were very low concentrations; reported values were less than 1 ppbv except for three acetone detections (1.9, 1.1, and 1.1 ppbv). If a corresponding VOC was detected in associated environmental sample at concentrations less than five times the blank concentration (less than ten times for common laboratory contaminants), then detected values were qualified as not detected during data validation. A total of 34 results were qualified as non-detects during data validation due to field blank sample results; (18) acetone results, (2) dichlorodifluoromethane results, (3) ethyl benzene results, (4) toluene results, (3) m, p-xylene results, and (4) o-xylene results (Table 5-1). Both acetone and toluene are considered common laboratory contaminants. No TCE sample results were qualified because all TCE detections were greater than five times the related field blank concentration.

Table 5-2
 Summary of January 2014 Duplicate Samples
 Chemical Waste Landfill Soil-Gas Monitoring
 Calendar Year 2014

Well ID/Parameter	Environmental Sample (R1)	Duplicate Sample (R2)	RPD ^a (%)
	(ppbv)		
CWL-UI1-120			
1,1,2-Trichloro-1,2,2-trifluoroethane	1000	1000	< 1
Trichloroethene	7600	7600	< 1
Tetrachloroethene	670	790	16
CWL-UI2-136			
Chloroform	570	540	5
Trichloroethene	6200	5900	5
1,1,2-Trichloro-1,2,2-trifluoroethane	930	900	3

Notes:

^aRPD = Relative percent difference is calculated with the following equation and rounded to nearest whole number. Bolded values exceed acceptance criterion of less than 50%.

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

where: R₁ = Environmental sample result.
 R₂ = Duplicate sample result.

ppbv = Parts per billion by volume basis.

5.2.3 Data Quality

Field QC sample results met the sampling DQOs and validated the adequacy of the field sampling procedures and protocol. RPD results for the two environmental-duplicate sample pairs met the RPD criterion of less than 50%. Internal laboratory QC samples, including laboratory control samples, replicates, matrix spikes, matrix spike duplicates, and surrogate spike 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 June 2014a).

No significant data quality issues were noted for January 2014 data sets. All data were determined to be acceptable and reported quality control measures were in compliance with analytical method and laboratory procedure requirements (i.e., technically defensible). Data Validation Reports and Contract Verification Review forms are provided in Annex B of this report and are filed in the SNL/NM Records Center.

5.2.4 Variances and Non-Conformances

There were no variances or non-conformances associated with the CY 2014 soil-gas activities.

5.3 Data Evaluation

Soil-gas monitoring is required to determine whether the groundwater beneath the CWL is adequately protected as part 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 of 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.

The trigger level of 20 ppmv only applies to the 95% LCL of the mean and not to individual sample results. For the first 5 years after the effective date of the PCCP (June 2, 2011), historical soil-gas monitoring results are to be used to augment the statistical analysis. After June 2, 2016, only soil-gas data collected under the PCCP is to be used. Historical soil-gas data used and presented in Section 5.4 includes results from June 1998, June 1999, August 2001, June 2004, September 2004, and October 2005. Although the VE VCM was not completed until 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 and discussed in Section 5.2.1, acetone (1.6 ppmv), toluene (0.62 ppmv), 1,1,2-trichloro-1,2,2-trifluoroethane (0.60 ppmv), TCE (4.70 ppmv), and m,p-xylene (0.53 ppmv) in the CWL-D2-470 sample exceeded the 0.5 ppmv threshold. 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. For duplicate analyses, only the highest detection is used for statistical analysis.

5.3.2 Statistical Assessment Results

CY 2014 soil-gas statistical assessment results are presented in Table 5-3. The LCLs for acetone, toluene, and m,p-xylene could not be calculated due to the combination of the low total number of sample results and the high standard deviation (i.e., high variability) of the data set. There are only ten results for these VOCs and the variability in the reported soil-gas concentrations appears to be representative of the residual soil-gas plume that is changing over time.

The calculated LCLs for 1,1,2-trichloro-1,2,2-trifluoroethane and TCE are below the trigger level of 20 ppmv. For the four VOCs where an LCL could not be calculated, the corresponding LCLs would be below the 20 ppmv trigger level if they could be calculated, as their corresponding UCLs are an order of magnitude or more below the trigger level.

Table 5-3
 Chemical Waste Landfill Soil-Gas Monitoring
 Statistical Assessment Results Summary
 Calendar Year 2014

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 ^d ?
Acetone (1.6 ppmv)	0.001	5	0.8173	1.584	NA	1.736	Normal	20	No
Toluene (0.062 ppmv)	0.001	0.62	0.1141	0.2193	NA	0.2412	Normal	20	No
Trichloroethene (4.7 ppmv)	0.001	7.1	4.164	2.326	2.816	5.512	Normal	20	No
1,1,2-Trichloro-1,2,2-Trifluoroethane (0.6 ppmv)	0.001	1.2	0.6671	0.3675	0.4541	0.8801	Normal	20	No
m,p-Xylene (0.53 ppmv)	0.001	0.53	0.09195	0.1739	NA	0.1928	Normal	20	No

Notes:

^aAll maximum concentrations are from CWL-D2-470 January environmental sample. CWL Permit Attachment 1, Section 1.8.2.2, defines the threshold concentration (0.50 ppmv) and trigger level (20 ppmv). Both concentration limits apply only to soil-gas constituents detected in the three deepest sampling ports of wells CWL-D1 through CWL-D3.

^bMinimum and maximum results determined from historical data, including the CY 2014 results.

^cMean, standard deviation, LCL, UCL, and Distribution Type determined using ProUCL statistical program.

^dExceedance determined by comparing the constituent LCL against the trigger level of 20 ppmv.

LCL = Lower confidence limit.

NA = Not applicable; LCL invalid due to low number of samples and high standard deviation of the data set.

ppmv = Parts per million by volume basis.

UCL = Upper confidence limit.

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 2014. To be consistent with historic soil-gas monitoring data sets and for a more technically sound historic comparison, the concentrations shown in Tables 5-4 and 5-5 for the 2012 and 2013 data sets are taken from the January sampling events that included results for all monitoring wells and sampling ports. The much more limited data set associated with resampling one port at two monitoring wells in May 2012 and March 2013 were not incorporated into Tables 5-4 and 5-5.

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, 19.0 and 16.0 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 October 2005 results are compared to the January 2014 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. Two of the three deep sampling ports (CWL-D1-470 and CWL-D2-470) had lower concentrations in January 2014 relative to October 2005. These trends are similar for the total VOC results. When January 2014 TCE results are compared to January 2013 results, all ports show decreasing or consistent concentrations except for three (CWL-D1-470, CWL-D2-440, and CWL-D3-480). For total VOC results, seven ports show increases in concentration, while 14 ports show decreases in concentrations.

Figures 5-1 through 5-5 show the concentration of TCE over time for each sampling port of 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 for each sampling port of CWL-UI1, CWL-UI2, CWL-D1, CWL-D2, and CWL-D3, respectively. The 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 at the shallowest two ports (36 and 40 feet bgs) (SNL/NM December 2004). Concentrations of total VOCs have decreased dramatically over time at these depths, most likely due to upward diffusion to the surface. Concentrations of TCE in the shallower soil-gas wells have remained relatively stable, and approximately half of the ports show small increases, as reflected in Table 5-4 and Figures 5-1 and 5-2 (compare the October 2005 results to the January 2012-2014 results). These small increases at CWL-UI1 and CWL-UI2 shallow sampling ports are consistent with upward diffusion of TCE soil gas from the former plume “core” located approximately 250 feet bgs.

Table 5-4
 Historic Soil-Gas Monitoring Summary – TCE Concentrations^a (ppmv)
 Chemical Waste Landfill

Well ID & Sample Port Depth ^b	June 1998	June 1999	August 2001	June 2004	September 2004	October 2005	January ^c 2012	January ^c 2013	January 2014
CWL-UI1-40	4.5	16.0	7.9	3.8	4.0	4.5	5.20	7.30	4.80
CWL-UI1-80	0.19	4.9	6.7	5.9	6.1	6.8	6.50	9.70	6.30
CWL-UI1-120	3.0	5.9	9.1	6.0	14.0	13.0	7.70	11.00	7.60
CWL-UI2-36	0.037	0.70	ND	1.6	ND	1.2	3.10	3.50	2.80
CWL-UI2-76	0.091	1.0	2.4	3.4	4.1	3.7	5.60	7.80	3.70
CWL-UI2-136	5.5	1.9	4.6	3.0	1.9	3.0	8.50	6.60	6.20
CWL-D1-100	0.220	2.5	7.1	9.8	13.0	12.0	10.00	12.00	9.90
CWL-D1-160	120.0	14.0	21.0	25.0	29.0	22.0	14.00	16.00	16.00
CWL-D1-240	160.0	44.0	44.0	34.0	34.0	24.0	22.00	23.00	19.00
CWL-D1-350	0.013	11.0	19.0	13.0	22.0	2.8	13.00	13.00	8.50
CWL-D1-470	0.077	0.17	0.25	0.25	0.27	0.34	0.51	0.08	0.16
CWL-D2-120	3.1	21.0	20.0	22.0	25.0	16.0	16.00	19.00	13.00
CWL-D2-240	ND	40.0	38.0	26.0	13.0	17.0	18.00	23.00	16.00
CWL-D2-350	0.064	12.0	18.0	11.0	17.0	5.0	11.00	13.00	9.90
CWL-D2-440	0.082	1.0	7.6	2.5	5.9	2.8	1.80	0.11	0.14
CWL-D2-470	ND	0.94	5.8	3.1	4.6	4.3	4.10	7.00	4.70
CWL-D3-120	0.009	1.1	4.0	6.0	4.9	4.5	7.00	5.30	4.10
CWL-D3-170	ND	2.5	9.9	4.5	6.6	4.4	7.90	7.20	5.40
CWL-D3-350	ND	1.6	2.4	2.2	1.5	1.4	8.80	7.80	5.30
CWL-D3-440	ND	1.8	0.26	0.75	3.4	3.3	6.80	13.00	8.20
CWL-D3-480	ND	1.9	1.2	0.2	2.1	4.1	0.21	0.03	0.04

Notes:

January 2012 – 2014 concentrations have been rounded for significant digit consistency; they may not exactly match the reported concentrations corresponding data tables.

^aJune 1998 through January 2012 are EPA Method TO-14 results. January 2013 and 2014 are EPA Method TO-15 results. If a duplicate sample was collected, the maximum concentration of the environmental-duplicate sample pair is shown,

^bPort depth is the last number in the Well Identification (ID), and is in feet below ground surface.

^cResults associated with duplicate resampling conducted in May (2012 data set) and March (2013 data set) are not included. CWL-D3-440 results for January 2012 collected in March 2012 due to issues with sampling this port; could not be sampled in January 2012.

ND = Not detected.

ppmv = Parts per million by volume.

TCE = Trichloroethene.

Table 5-5
 Historic Soil-Gas Monitoring Summary – Total Volatile Organic Compound Concentrations^a (ppmv)
 Chemical Waste Landfill

Well ID & Sample Port Depth ^b	June 1998	June 1999	August 2001	June 2004	September 2004	October 2005	January ^c 2012	January ^c 2013	January 2014
CWL-UI1-40	112	246	141	11.78	11.47	13.15	11.76	14.68	9.54
CWL-UI1-80	0.22	9.63	13	10.61	10.67	11.61	10.18	13.74	9.43
CWL-UI1-120	6.32	9.94	45.42	9.36	21.41	19.18	11.07	14.64	11.20
CWL-UI2-36	17.6	2117	1800	813.7	850.0	391.78	4.64	5.02	4.81
CWL-UI2-76	0.126	1.65	4.37	5.52	6.90	5.96	7.85	10.74	6.04
CWL-UI2-136	10.5	4.21	7.98	4.42	2.85	4.89	11.45	9.12	9.31
CWL-D1-100	0.248	4.93	11.9	14.59	18.22	17.25	13.84	15.90	14.25
CWL-D1-160	167	21.4	30.1	33.32	38.41	29.28	18.48	20.33	21.45
CWL-D1-240	261	78.4	61.5	45.27	44.74	32.60	22.46	28.71	25.32
CWL-D1-350	0.02	20.7	31.7	18.73	30.53	4.07	16.56	16.31	11.61
CWL-D1-470	0.105	0.231	0.921	0.612	0.82	0.603	0.87	0.13	0.39
CWL-D2-120	5.4	33.0	29.4	29.26	34.23	22.31	20.70	24.05	18.49
CWL-D2-240	0.047	101	52.9	34.72	17.62	22.83	22.90	28.38	22.11
CWL-D2-350	0.091	22.9	25.9	15.42	23.41	7.50	13.31	16.01	16.04
CWL-D2-440	0.453	4.38	11.8	3.85	9.29	4.17	2.60	0.15	0.22
CWL-D2-470	0.058	6.95	8.40	4.17	6.60	6.40	5.78	8.49	10.14
CWL-D3-120	0.009	2.17	6.20	8.39	7.10	6.23	9.19	6.80	6.92
CWL-D3-170	0.037	5.01	15.0	6.11	9.40	6.12	10.57	9.18	8.83
CWL-D3-350	0.106	2.76	3.98	3.39	2.34	2.27	12.90	10.44	9.12
CWL-D3-440	0.017	4.04	0.519	0.96	5.14	4.64	9.69	17.73	12.60
CWL-D3-480	0.001	4.47	1.85	0.31	3.30	5.71	0.30	0.06	0.05

Notes:

January 2012 - 2014 concentrations have been rounded for significant digit consistency; they may not exactly match the reported concentrations corresponding data tables.

^aThe total VOC concentration is the sum of all detected constituents. June 1998 through January 2012 are EPA Method TO-14 results. January 2013 and 2014 are EPA Method TO-15 results. If a duplicate sample was collected, the maximum concentration of the environmental-duplicate sample pair is shown,

^bPort depth is the last number in the Well Identification (ID), and is in feet below ground surface.

^cResults associated with duplicate resampling conducted in May (2012 data set) and March (2013 data set) are not included. CWL-D3-440 results for January 2012 collected in March 2012 due to issues with sampling this port; could not be sampled in January 2012.

ppmv = Parts per million by volume.

VOC = Volatile organic compound.

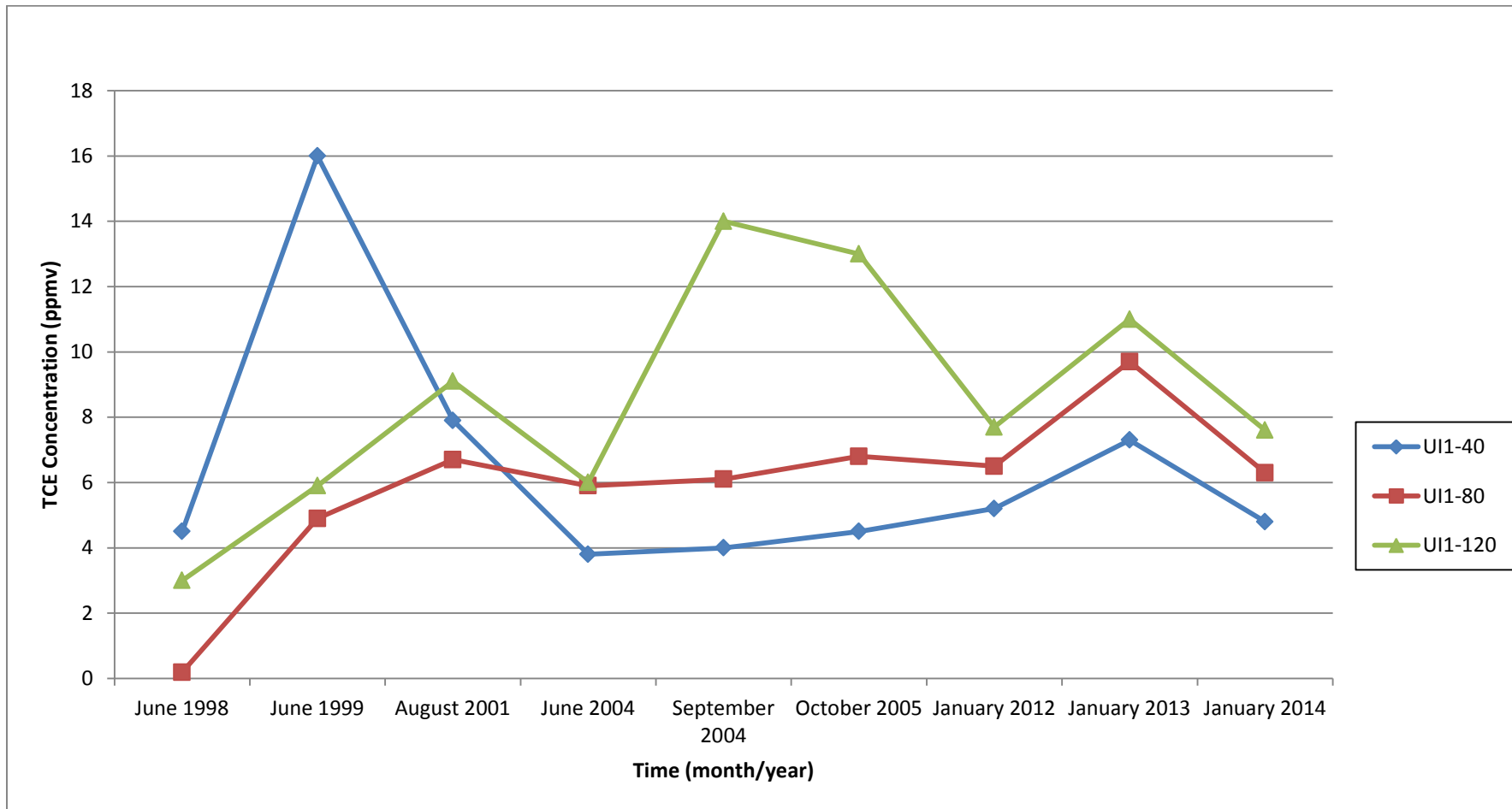


Figure 5-1
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-1 Ports

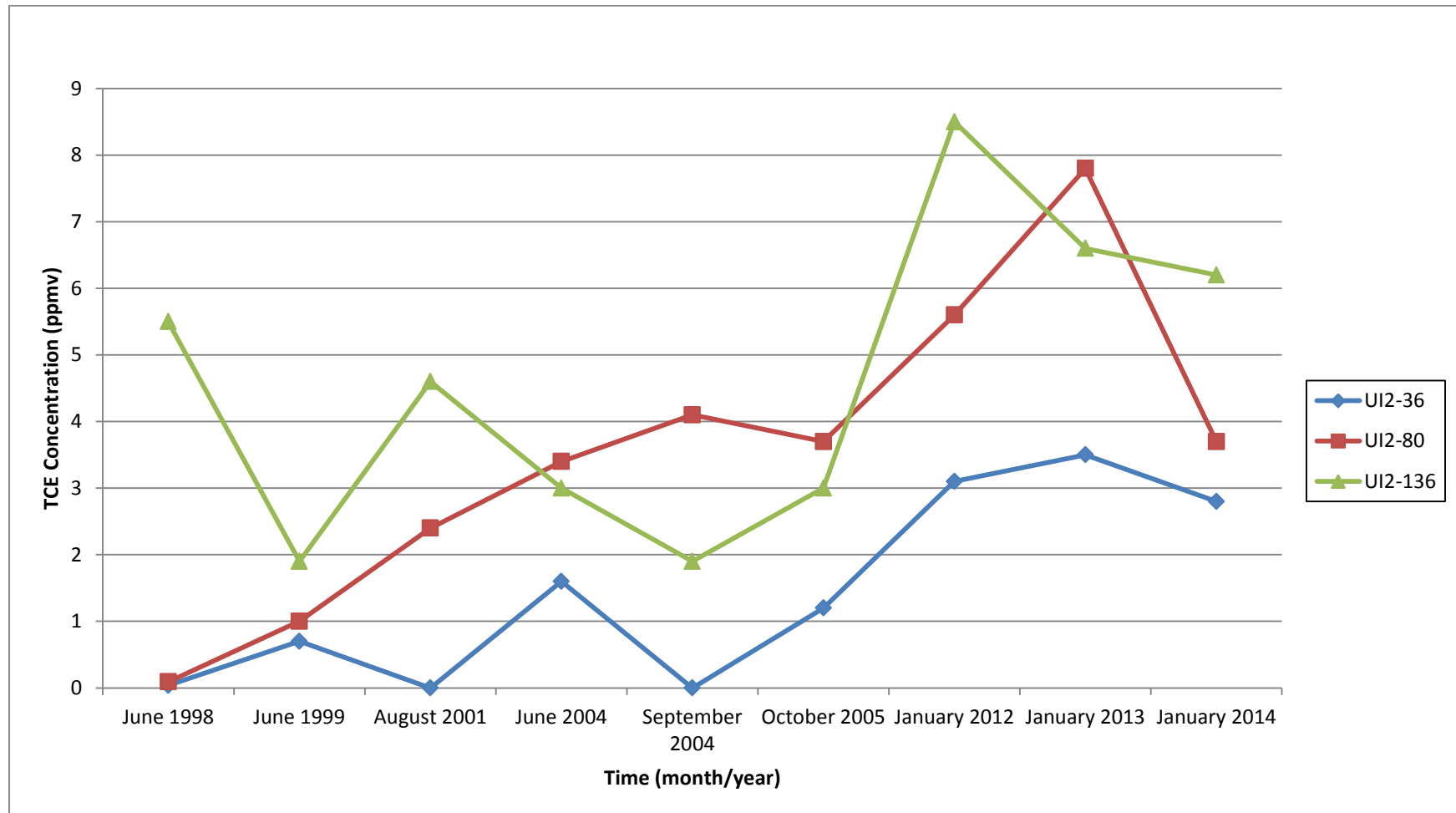


Figure 5-2
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-2 Ports

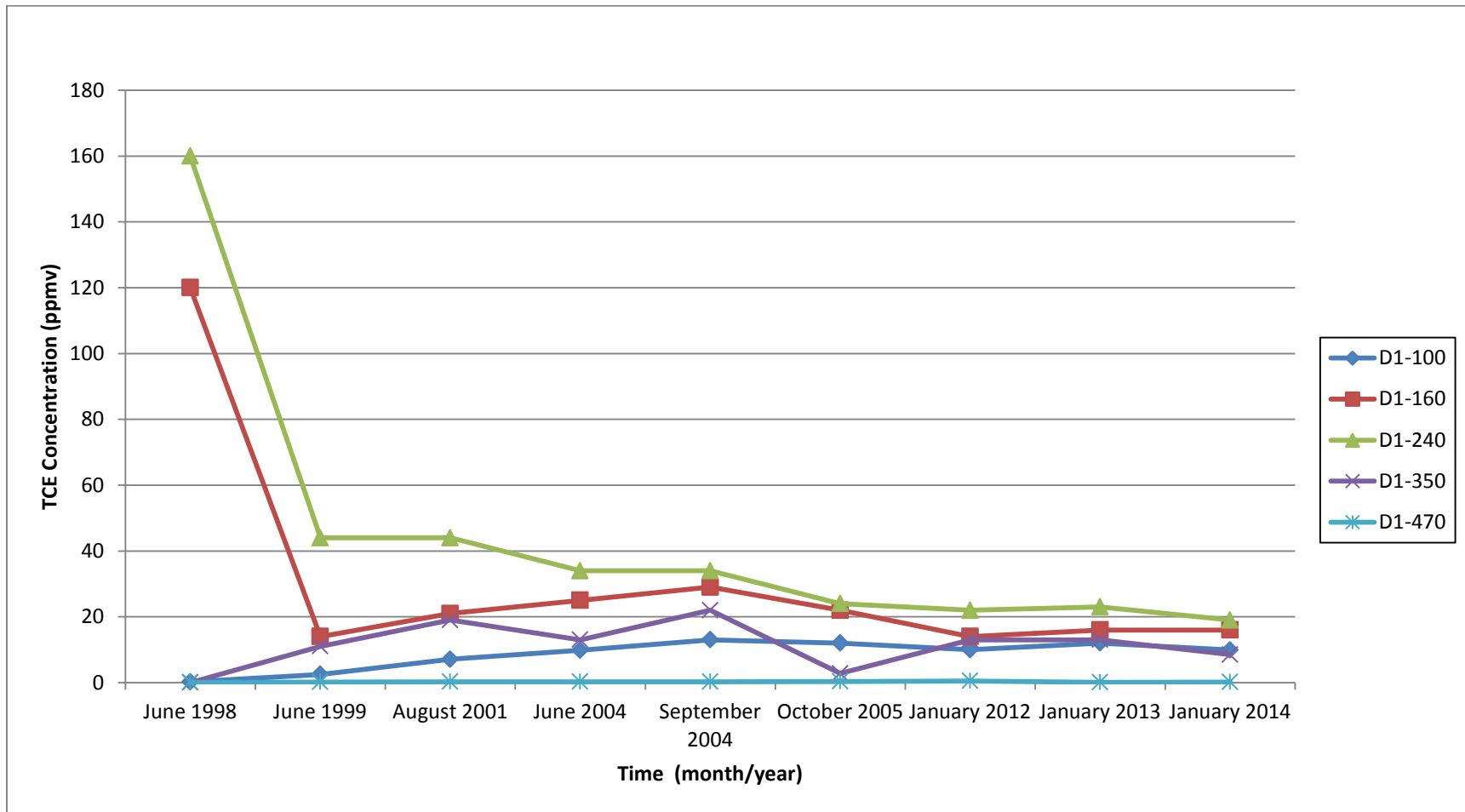


Figure 5-3
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well D1 Ports

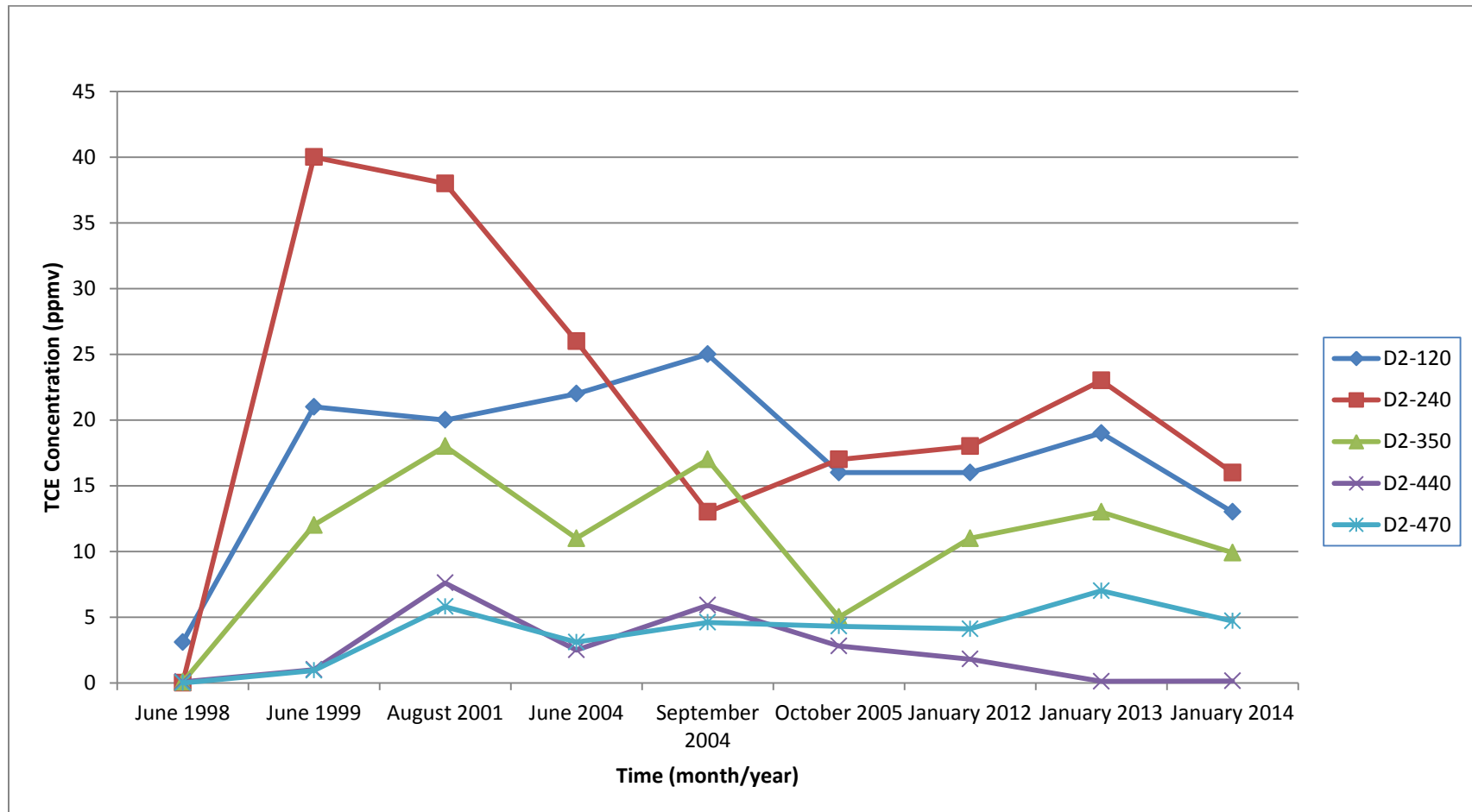


Figure 5-4
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well D2 Ports

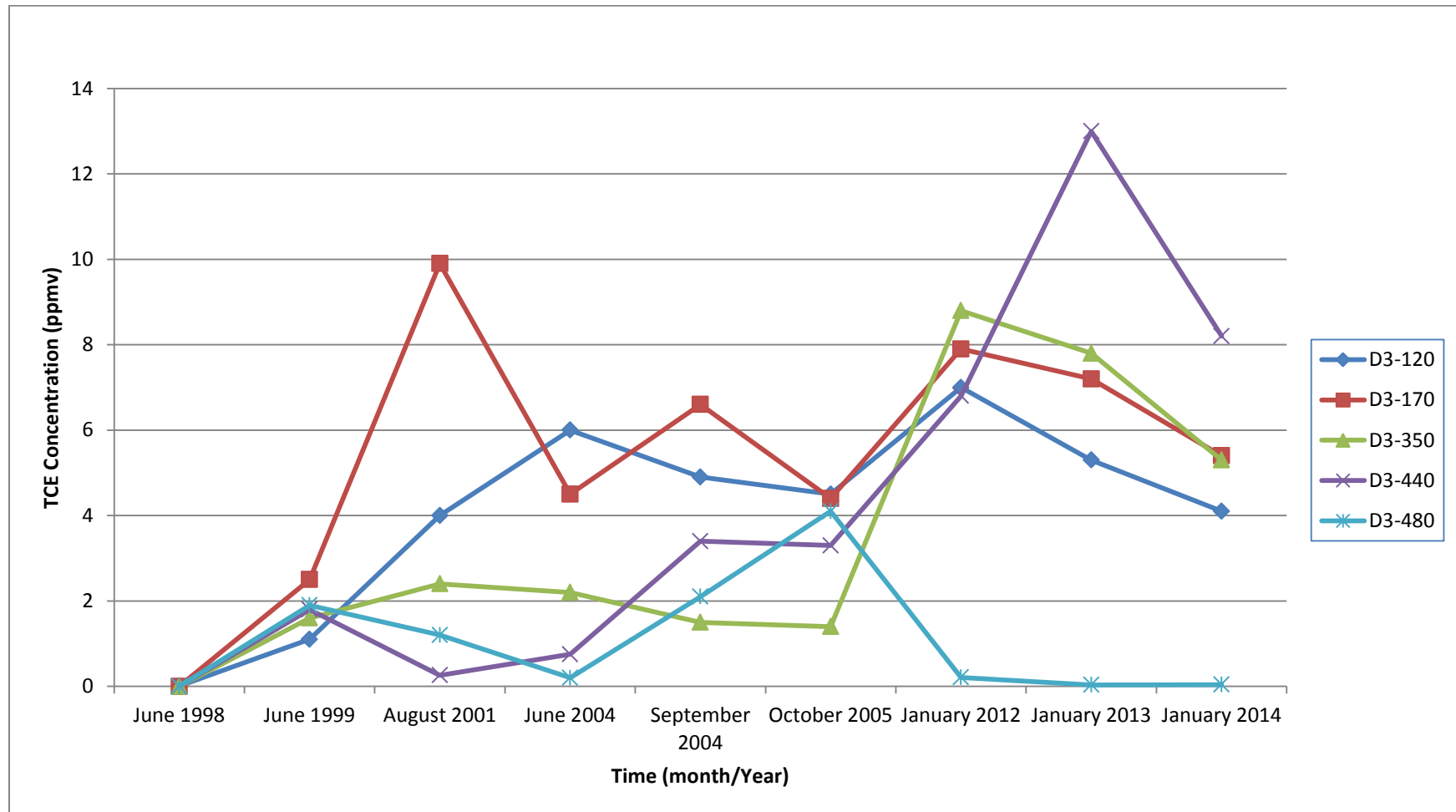


Figure 5-5
Historic Total TCE Compound Concentrations vs. Time
Chemical Waste Landfill Well D3 Ports

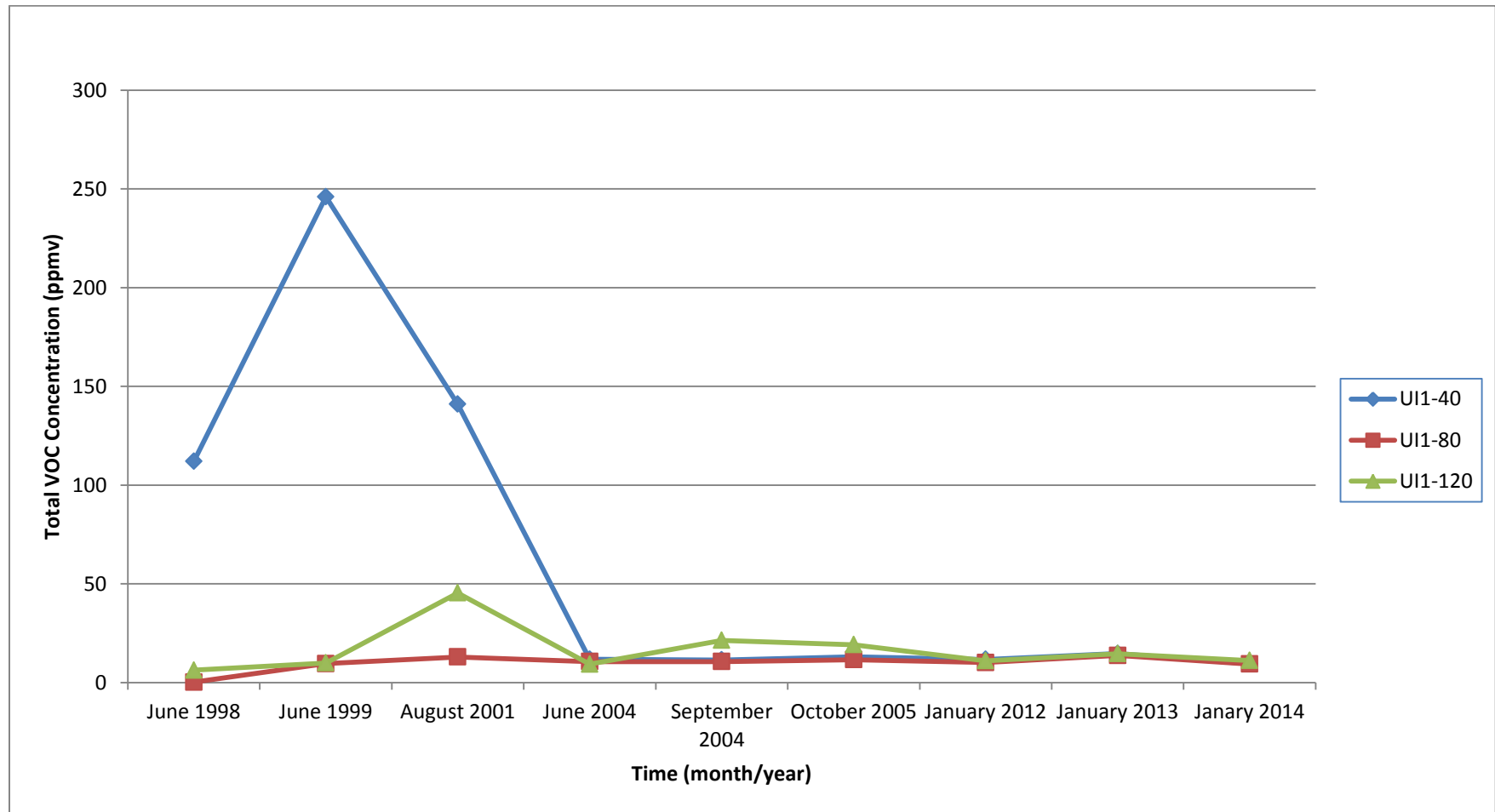


Figure 5-6
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-1 Ports

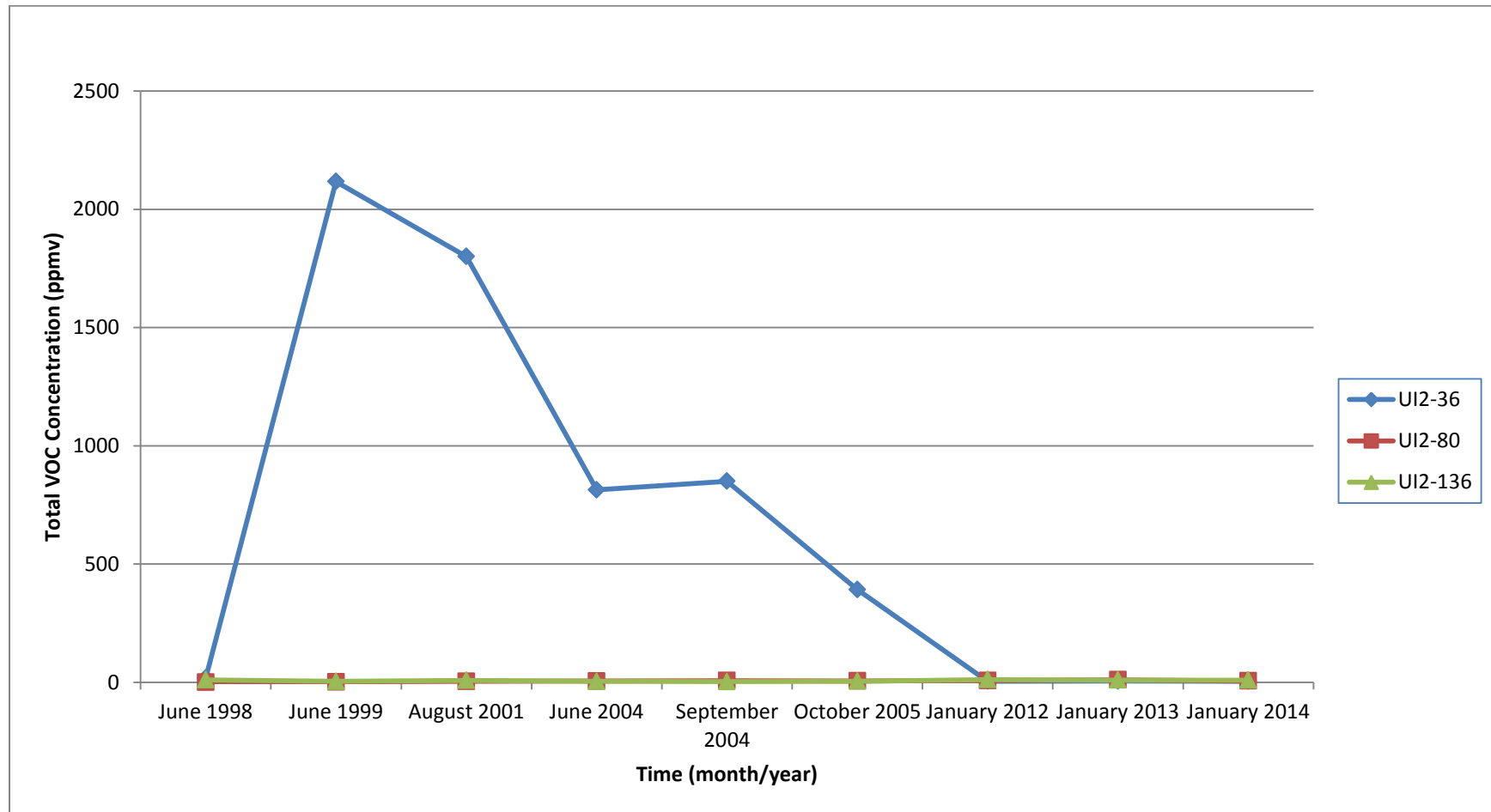


Figure 5-7
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well UI-2 Ports

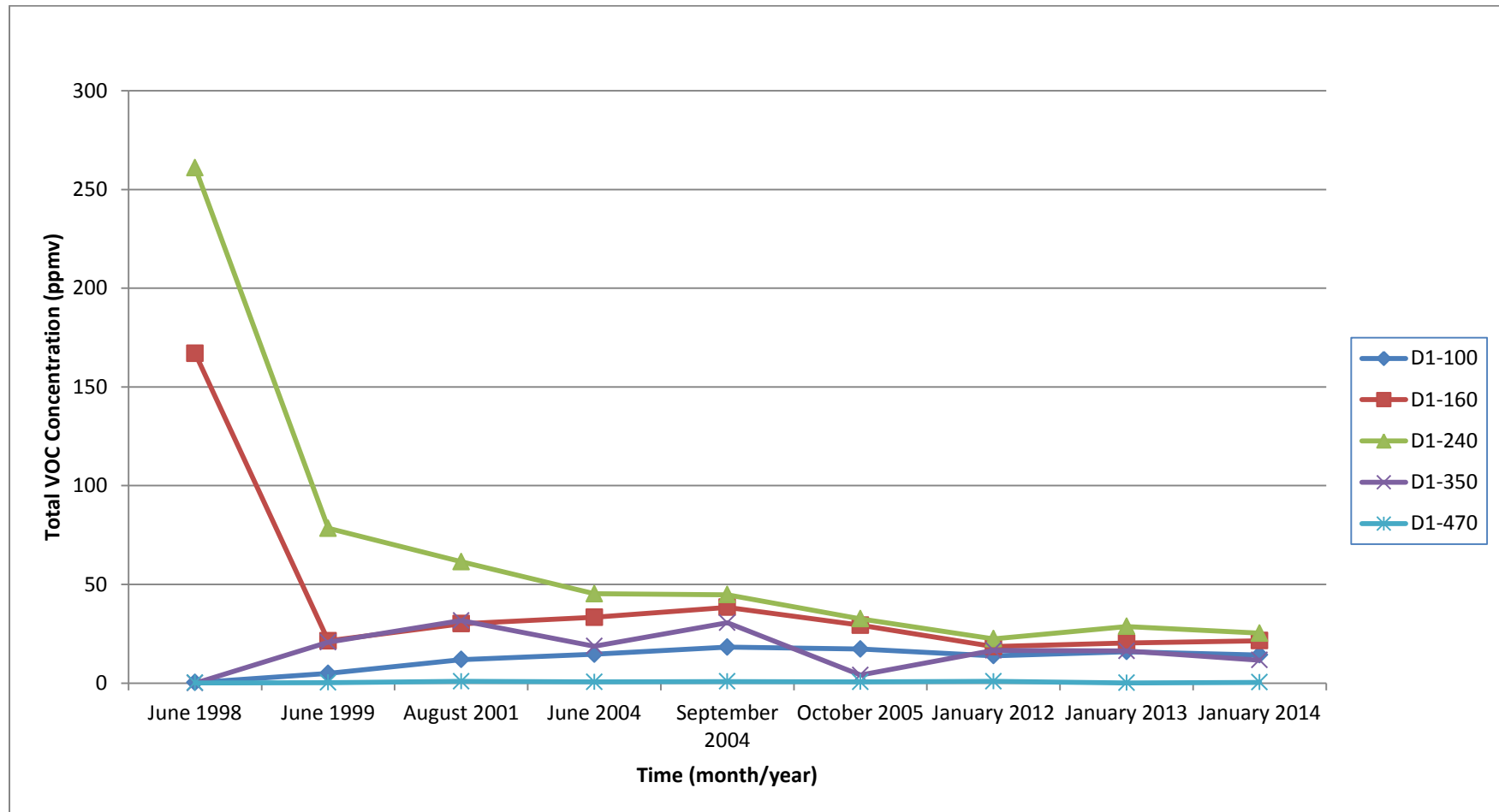


Figure 5-8
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well D1 Ports

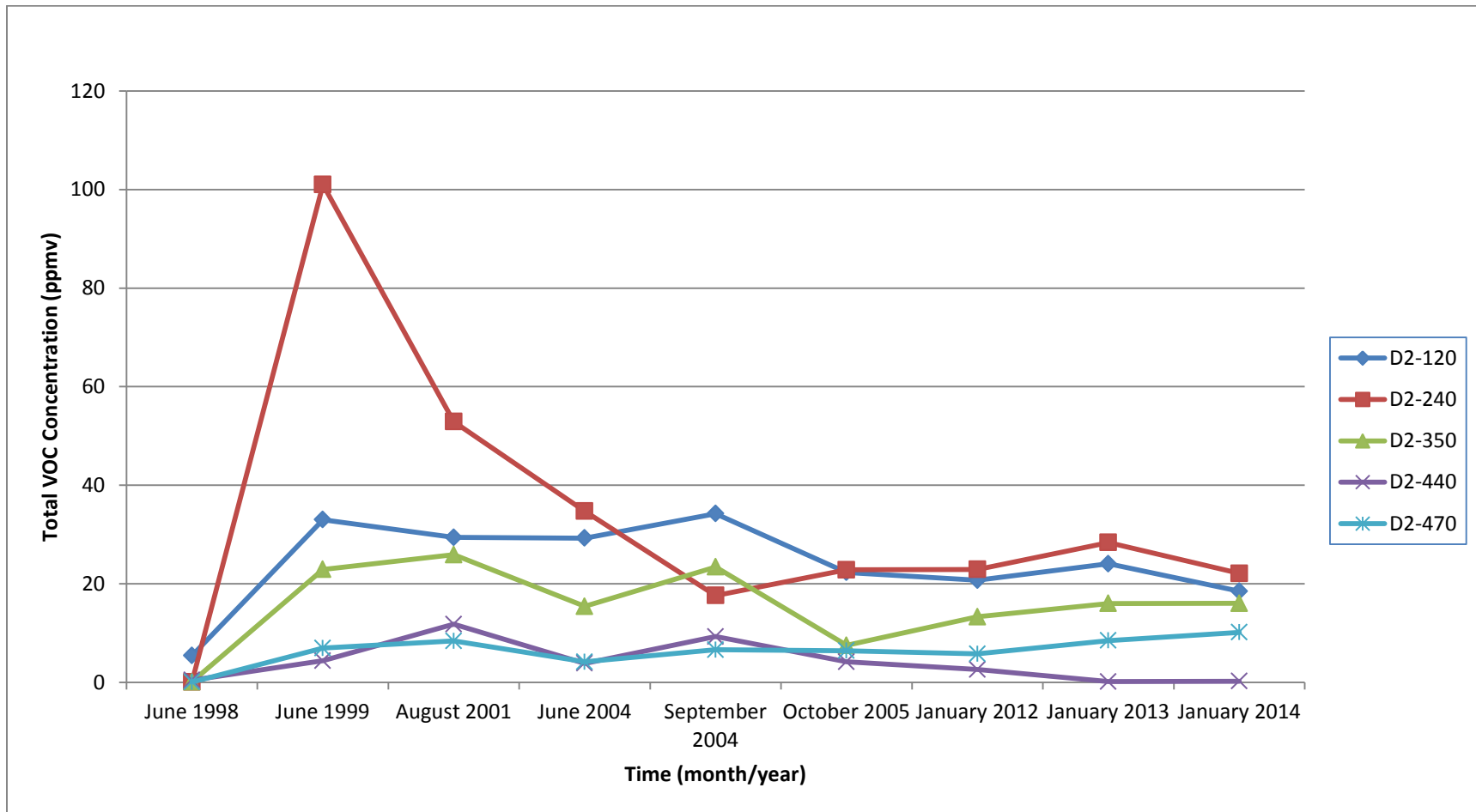


Figure 5-9
Historic Total VOC Compound Concentrations vs. Time
Chemical Waste Landfill Well D2 Ports

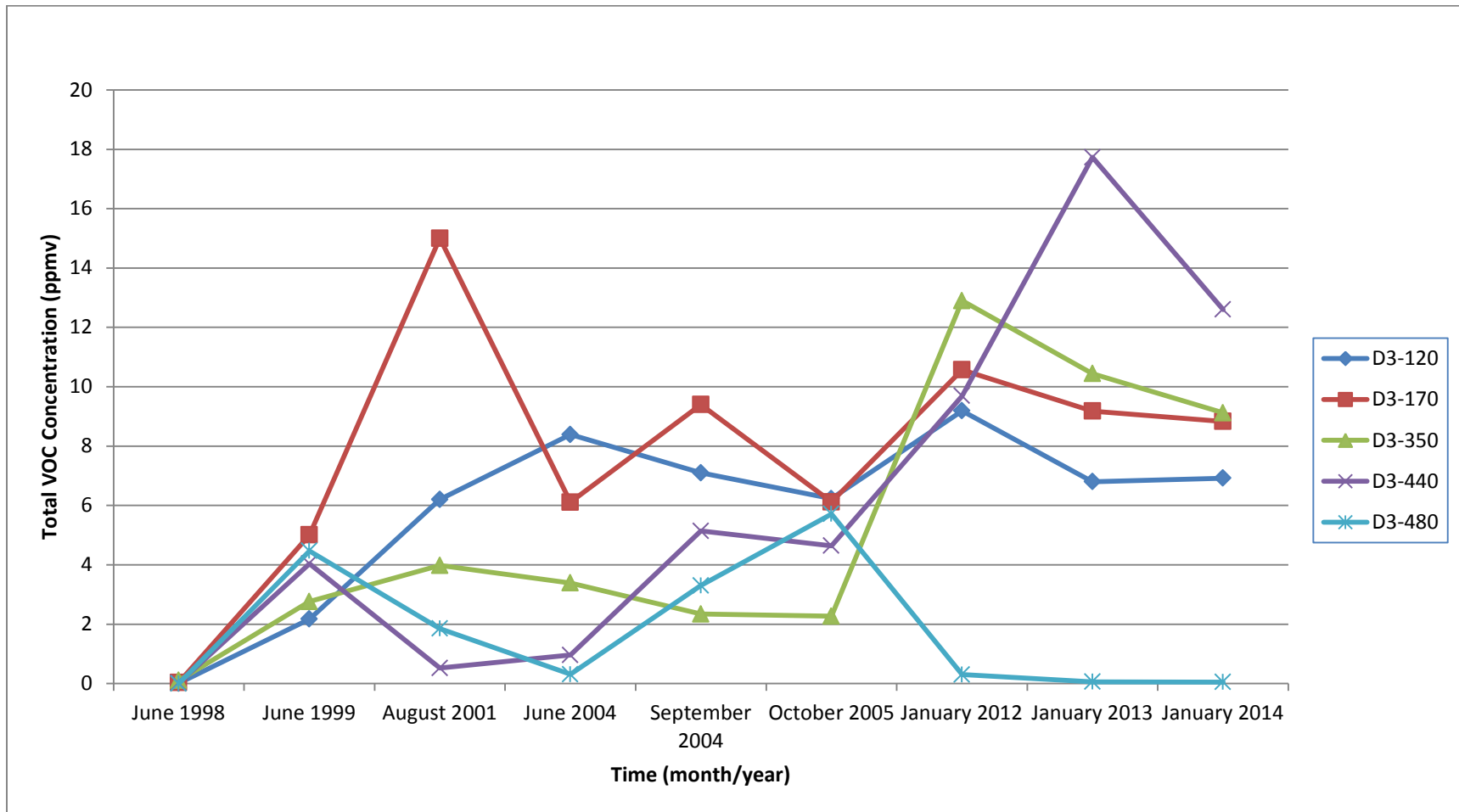


Figure 5-10
 Historic Total VOC Compound Concentrations vs. Time
 Chemical Waste Landfill Well D3 Ports

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 primary VOC of concern, although trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, PCE, 1,1-dichloroethene, and chloroform were also been detected in most of the samples. Together with TCE, these VOCs comprise the majority of the total VOC concentration calculated for each sample. Concentrations are generally steady or decreasing over time (Figures 5-3 and 5-4), except at the CWL-D3 location (Figure 5-5). Relative to June 1999 results, concentrations are generally higher in the CWL-D3 ports except at the 480 foot bgs port, which has decreased. All sampling ports at CWL-D3 show lower TCE concentrations in 2014 relative to 2013, except at the 480 foot bgs port (unrounded results for 2013 and 2014 are essentially the same, 34 ppbv and 35 ppbv, respectively). Over the historic monitoring period, the highest TCE and total VOC concentrations in the deepest ports have been consistently observed at the CWL-D2 location (one to two orders of magnitude higher). It is important to note the vertical scale difference on Figures 5-4 and 5-5 relative to Figure 5-3, as it exaggerates the appearance of minor (ppmv) changes in TCE concentration. This is especially true of Figure 5-5. Again, these trends are also reflected in the total VOC plots shown in Figures 5-8 through 5-10.

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. The Baroball™ devices remained on all groundwater and soil-gas monitoring wells throughout CY 2014 and were inspected during the sampling events. It is unlikely that the current residual VOC soil-gas plume will directly impact groundwater due to the declining surface of the regional aquifer beneath the CWL (Section 4.4 and Annex E of CWL Corrective Measures Study Report [SNL/NM December 2004]). Based upon historical groundwater monitoring results and statistical evaluation of more recent results (Section 4.3), statistically significant evidence of increasing contamination in groundwater has not been observed since completion of the VE VCM in 1998.

Overall, the CY 2014 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).

6.0 INSPECTION, MAINTENANCE, AND REPAIR RESULTS

This chapter presents a summary of CY 2014 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 PCCP Attachment 1, Section 1.10, Table 1-6. CY 2014 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 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, security fence, and survey monuments, 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 (PCCP Attachment 1, Section 1.9). This determination changed the required frequency of cover vegetation inspection to an annual basis. ET Cover vegetation was monitored throughout CY 2014 and cover maintenance activities were performed both before (April, May, June, and August) and after (October) the CY 2014 annual inspection (Section 6.1.2).

The annual Biology Inspection of the ET Cover vegetation was conducted on September 2, 2014 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 2010 through 2012 meteorological conditions (i.e., lack of significant rainfall events that fully saturate the soil) caused significant vegetation stress, the ET Cover foliar coverage and vegetation continue to meet PCCP requirements for successful revegetation (i.e., greater than 20% foliar coverage, with greater than 50% of that foliar coverage comprised of native species). The ET Cover maintenance work performed in August 2013 (weed removal,

spot herbicide application, and reseeding of sparse areas followed by supplemental watering in September-October 2014) was particularly important relative to helping the previously established ET Cover native grasses recover, and in facilitating the successional development of new (to the ET Cover) native grass species. No barren areas exceeding 200 square feet or large mammal burrows (i.e., greater than four inches in diameter) were observed during the annual biology inspection, but ant hills/burrows and small mammal burrows were observed similar to previous inspections. In general the level of weedy plant species present on the cover was very low. Juvenile four-wing saltbush plants (i.e., potentially deep-rooted plants) were identified across the cover but at a very low (i.e., trace) percent foliar coverage.

The foliar coverage based on the September annual inspection was approximately 44%, of which 98% is native vegetation (Inspection Form in Annex C). This is an improvement from 2013 inspection results, which was 38% foliar coverage, of which 90% was native vegetation. The successional changes in ET Cover vegetation is evident in the percent foliar coverage of blue grama grass clumps, which decreased from 45% in September 2012 to 18% in September 2013 to 15% in September 2014. Sand dropseed was the dominant native grass in September 2014 (21% foliar coverage), and together with blue grama (15% foliar coverage) comprises the majority of the current ET Cover vegetation. Only trace amounts of four-wing saltbush were observed during the September 2014 inspection. Similar to the 2013 inspection, many weedy species, including weedy grasses, were present on the cover.

The 2014 Chemical Waste Landfill Biology Report (Biology Report) is presented in Annex D of this report and provides background information on ET Cover revegetation efforts. This report includes a summary of 2014 cover maintenance activities and local climate trends, additional details on the September Biology Inspection and the successional development of the native grasses, ET Cover photographs, and recommendations. CY 2014 cover maintenance activities are summarized below.

6.1.2 Cover Maintenance

Cover maintenance performed during CY 2014 is summarized below. Overall, the cover maintenance required was less than in 2013 and involved smaller-scale weed removal activities. In all cases, work was performed by hand and no vehicle traffic was allowed on the ET Cover.

April 7 – 11, 2014

Dry, dead weed material (primarily tumbleweeds) was removed from the cover vegetation, storm water diversion features, and perimeter fence line. Approximately 60 cubic yards of compressed weed debris were removed and disposed at the KAFB Landfill. The majority of this material was tumbleweeds that had blown in against the perimeter fence.

May 28 – June 3, 2014

Dry, dead weed material (primarily tumbleweeds) was removed from the storm water diversion features and perimeter fence line. In addition, dead and live weeds were removed from the ET Cover, the western perimeter area between the fence and road, and a 10-foot buffer area

outside the fence. Approximately 30 cubic yards of compressed weed debris were removed and disposed at the KAFB Landfill. The majority of this material was tumbleweeds that had blown in against the perimeter fence.

During the July 2014 groundwater monitoring event and well/equipment inspection, a small burrow was observed just inside the fence line on the western perimeter, near monitoring well CWL-MW11. The staff biologist was notified and inspected the burrow using a small, downhole camera to determine extent and activity level on July 10, 2014. The shallow burrow was determined to be inactive (i.e., abandoned) and was backfilled with adjacent soil.

August 14 – 19, 2014

Dry, dead weed material (primarily tumbleweeds) was removed from the storm water diversion features and perimeter fence. Dead and live weeds were removed from the ET Cover, the western perimeter area between the fence and road, and a 10-foot buffer area outside the fence. The herbicide Strike 3® from Winfield Solutions was applied to the western perimeter area between the fence line and the road (i.e., outside of the ET Cover and perimeter fence) in accordance with manufacturer's instructions to prevent additional weed growth in this area immediately adjacent to the ET Cover. Approximately 15 cubic yards of compressed weed debris were removed and disposed at the KAFB Landfill. The majority of this material was tumbleweeds that had blown in against the perimeter fence.

October 28, 2014

Dry, dead weed material (primarily tumbleweeds) was removed from the storm water diversion features and perimeter fence. Dead and live weeds were removed from the ET Cover, the western perimeter area between the fence and road, and a 10-foot buffer area outside the fence. Approximately 1 cubic yard of compressed weed debris was removed and disposed at the KAFB Landfill.

CY 2014 Supplemental Watering

The staff biologist recommended supplemental watering in CY 2014 to augment natural precipitation. Water was applied to the ET Cover using a large sprinkler at six locations to ensure an even distribution. The amount of water used at each sprinkler location was calculated based on the aerial coverage of the sprinkler to be equivalent to a ½-inch rain event. Supplemental watering events for CY 2014 are summarized below.

- May 27-28: one, ½-inch-equivalent watering event.
- June 3: one, ½-inch-equivalent watering event.
- October 13-14: one, 1-inch-equivalent watering event.

6.1.3 Cover Inspection

Quarterly cover surface inspections were performed by a field technician in March, June, September, and December of 2014. 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 2014. During the March inspection, windblown tumbleweed debris was noted at the entrance of the two drainage culverts at the south end of the site (part of the southern boundary drainage swale). This tumbleweed debris was removed in early April during ET Cover maintenance work described above (Section 6.1.2). During the September inspection, windblown tumbleweeds were noted in the two drainage culverts at the south end of the site. The culverts were cleared during the inspection. During the December inspection, soil accumulation in excess of 6-inches was noted in the culvert at the southwest corner of the site. The soil was removed from the culvert at the time of the inspection. No other inspection parameters required repairs.

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 2014. In January the annual inspection for the soil-gas monitoring wells and sampling equipment was also performed. No inspection parameters required repairs. Baroball™ passive venting devices remain on all soil-gas and groundwater monitoring wells, and are in good condition.

During the July groundwater monitoring well inspection, a small animal burrow was observed just inside the fence line on the western perimeter, near monitoring well CWL-MW11. The staff biologist was notified and addressed the burrow (see Section 6.1.1).

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 2014. During the March inspection, windblown tumbleweed debris was noted on the perimeter fence. This tumbleweed debris was removed in early April during ET Cover maintenance work described above (Section 6.1.2). During the June inspection, the western most survey benchmark was covered with windblown soil, which was cleared/removed at the time of the inspection. During the September inspection, the two western-most survey benchmarks were covered with windblown plant debris and soil. The survey benchmarks were cleared during the inspection. During the December inspection, tumbleweed debris was observed on the perimeter fence. The tumbleweeds were removed from the fence during the inspection. No other inspection parameters required repairs.

6.5 Emergency Equipment Inspection

For the CWL, quarterly inspection of emergency equipment listed in PCCP Attachment 6, Table 6-4, is required. 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 took effect (Kieling June 2011). NMED-approved Permit modifications and DOE/Sandia submittals since the PCCP became effective are summarized in Chapter 1. Regulatory activities in CY 2014 consisted of one submittal of two updated reference documents cited in the PCCP and submittal of the Calendar Year 2013 Chemical Waste Landfill Annual Post-Closure Care Report (SNL/NM March 2014). These activities are summarized below in Sections 7.1 through 7.3, respectively.

7.1 Permit Modification Requests

There were no Permit modification requests in CY 2014.

7.2 Permit Submittals

On March 25, 2014, DOE and Sandia submitted the Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2013 to NMED (SNL/NM March 2014).

On July 8, 2014, DOE and Sandia submitted two updated reference documents cited in the PCCP in accordance with requirements of Attachment 2, Section 2.0 and Attachment 3, Section 3.9 of the PCCP (Todd July 2014). Revisions included updates to keep the reference documents current and to reflect ongoing modifications and improvements in industry practices. The revised reference documents became effective on June 16, 2014.

7.3 Technical Communication

There were no technical communications with NMED staff in CY 2014.

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8.0 SUMMARY AND CONCLUSIONS

A summary of CY 2014 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 2014. 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.

Statistical assessment was conducted on results from replacement well CWL-BW5 and new wells CWL-MW9, CWL-MW10, and CWL-MW11. There was no statistically significant evidence of increasing contamination and no hazardous constituent 95% LCL of the mean exceeded its respective concentration limit. Groundwater surface elevation, hydraulic gradient, flow direction, and groundwater flow rate have been determined and are consistent with historical results.

One annual soil-gas monitoring event was conducted in January 2014. Samples collected from all wells were analyzed for VOCs by analytical method TO-15 for the second time (TO-14 was used prior to 2013). TCE was detected in all samples at concentrations ranging from 0.035 parts ppmv at CWL-D3 (480 foot bgs sample port) to 19 ppmv at CWL-D1 (240 foot bgs sample port). The maximum soil-gas concentration from the three deepest sampling ports (CWL-D1-470, CWL-D2-470, and CWL-D3-480) was TCE at a concentration of 4.7 ppmv (CWL-D2-470). In addition, 1,1,2-trichloro-1,2,2-trifluoroethane; trichlorofluoromethane; and PCE were detected in all samples at lower concentrations. The 95% LCL of the mean was calculated and compared to the 20 ppmv trigger level for all VOCs that exceeded the threshold value of 0.5 ppmv from the deepest sampling ports of wells CWL-D1 through CWL-D3. Only five VOCs exceeded 0.5 ppmv at the three deepest sampling ports and all of these detections were from CWL-D2-470. There were no exceedances of the 20 ppmv trigger level. In general, the soil-gas monitoring results continue to indicate 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 PCCP requirements. No repairs were required, but during the December inspection tumbleweed debris was removed from the southern boundary swale (conditions met PCCP specifications, but the debris was removed as preventive maintenance).

Based upon the September biology inspection, the ET Cover continues to meet successful revegetation criteria. ET Cover maintenance was performed in February, August, September,

and October, and included removal of four-wing saltbush, annual weedy species, discrete herbicide application for weed control, seeding, and supplemental watering.

8.3 Regulatory Activities

Regulatory activities in CY 2014 included submittal of the Chemical Waste Landfill Annual Post-Closure Care Report, Calendar Year 2013 and submittal of updated reference documents cited in the PCCP.

8.4 Conclusions

All PCCP monitoring, inspection, and maintenance/repair requirements have been met for CY 2014. This CWL Annual Post-Closure Care Report documents all 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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Kieling, J.E., June 2011. "Notice of Approval, Closure of Chemical Waste Landfill and Post-Closure Care Permit in Effect, Sandia National Laboratories, EPA ID No. NM5890110518, HWB-SNL-10-013," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, Jun 2, 2011.

New Mexico Environment Department (NMED), October 2009. "Resource Conservation and Recovery Act, Post-Closure Care Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy/Sandia Corporation, for the Sandia National Laboratories Chemical Waste Landfill," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, October 15, 2009.

Sandia National Laboratories/New Mexico (SNL/NM), June 2014a. "Data Validation Procedure for Chemical and Radiochemical Data," (AOP 00-03), Sample Management Office, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), June 2014b. "Calendar Year 2013 Annual Groundwater Monitoring Report," SAND2014-15438R, Sandia National Laboratories, Albuquerque, New Mexico.

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Sandia National Laboratories/New Mexico (SNL/NM), September 2010. "Chemical Waste Landfill Final Resource Conservation and Recovery Act Closure Report," Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

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Sandia National Laboratories/New Mexico (SNL/NM), October 1995. "Chemical Waste Landfill Groundwater Assessment Report," Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), December 1992. "Chemical Waste Landfill Final Closure Plan and Postclosure Permit Application," Sandia National Laboratories, Albuquerque, New Mexico.

SNL/NM, see Sandia National Laboratories/New Mexico.

Todd, J. W., July 2014. "Submittal of Updated Reference Documents Cited in the Chemical Waste Landfill Post Closure Care Permit for the Department of Energy National Nuclear Security Administration/Sandia Site Office and Sandia National Laboratories/New Mexico, EPA ID No. NM5890110518," U.S. Department of Energy, July 8, 2014.

U.S. Environmental Protection Agency (EPA), January 1999a. "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.

U.S. Environmental Protection Agency (EPA), January 1999b. "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-15," Center for Environmental Research Information, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio.

U.S. Environmental Protection Agency (EPA), November 1986. "Test Methods for Evaluating Solid Waste," 3rd ed., Update 3, SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

ANNEX A
Chemical Waste Landfill
CY 2014 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 2014 GROUNDWATER MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-BW5 Date: 01/09/14 Time: 0805

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

Weather Conditions:

Temp: 52.3 °F Wind Speed: 0 MPH Humidity: 23.1 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules 7/13/14
Other: _____

Safety Topics Presented

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

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

Attendees

Robert Lynch
Printed Name

[Signature]
Signature

William Gibson
Printed Name

[Signature]
Signature

ALFRED SANTILLANES
Printed Name

[Signature]
Signature

Printed Name

Signature

Printed Name

Signature

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW 9 Date: 1/10/14 Time: 0800

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

Weather Conditions:

Temp: 53.2 °F Wind Speed: 0 MPH Humidity: 22.5 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules *TA 7/3/14*

Other: _____

Safety Topics Presented

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

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW11 Date: 1/13/2014 Time: 0825

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

Weather Conditions:
 Temp: 29 °F Wind Speed: 8 MPH Humidity: 40 % Wind Chill 22 °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules *TA 7/3/14*
 Other: _____

Safety Topics Presented

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

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

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW10 Date: 1/14/14 Time: 0800

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

Weather Conditions:

Temp: 54.3 °F Wind Speed: 0 MPH Humidity: 26.1 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules TA
 Other: 7/3/14

Safety Topics Presented

<input checked="" type="checkbox"/> Be aware of slips, trips, and falls. Keep work area clean and use a stepping stool when necessary.	<input checked="" type="checkbox"/> Be aware of environmental conditions (heat / cold stress). Dress accordingly. Wear sunscreen if necessary. Stay hydrated.
<input checked="" type="checkbox"/> Wear safety boots.	<input checked="" type="checkbox"/> Be aware of electrical hazards
<input checked="" type="checkbox"/> Use safe lifting practices. Wear leather gloves if necessary.	<input checked="" type="checkbox"/> Be aware of pressure hazards.
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<input checked="" type="checkbox"/> Be aware of chemical hazards.	<input checked="" type="checkbox"/> Be aware of biohazards (snakes, spiders, etc.)
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<input checked="" type="checkbox"/> Wear chemical safety goggles.	<input checked="" type="checkbox"/> Avoid spilling purge / decon water.

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

Attendees

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1/15/14

FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL GWM	Project No.: 146422.10.11.03
Well I.D.: CWL-BW 5	Date: 01/09/14
Well Condition: <i>see Inspection Form</i>	Weather Condition: <i>see Tailgate form</i>
Method: Portable pump <input checked="" type="checkbox"/> Dedicated pump <input type="checkbox"/>	Pump depth: 521'

PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol (Legal)	Temp (°C)	SC (µS/cm)	ORP (mV)	pH	Turbidity (NTU)	DO (%)	Comments
511.05	0822	/	START						DO mg/L
514.92	0844	5	17.83	901.1	243.8	7.01	0.53	76.6	7.27
516.03	0855	10	18.80	929.6	248.0	7.04	1.03	75.5	7.01
516.88	0907	15	19.06	934.6	254.0	7.00	1.09	77.2	7.13
517.09	0911	17	18.90	931.1	257.2	7.00	1.01	76.6	7.09
517.30	0915	19	18.91	930.4	259.6	7.00	1.23	76.6	7.10
517.46	0920	21	19.12	934.0	260.5	7.00	1.28	76.9	7.10
517.65	0924	23	19.20	935.0	263.1	6.99	0.94	76.9	7.07
	0925	/	SAMPLING						
									(615185 FB-2 12-18-13)
									~4.00 gals purged from tubing 0833

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FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: CWL GWM	Project No.: 146422.10.11.03
Well I.D.: CWL-MW 10	Date: 01/14/14
Well Condition: See Inspection Form	Weather Condition: see Tailgate Form
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
500.40	0820		START						DDmg/L
505.6	0901	5	16.50	713.5	226.6	7.19	2.32	12.3	1.20
507.26	0912	7	17.04	723.0	209.8	7.19	4.68	12.1	1.16
508.83	0924	9	17.09	727.0	209.6	7.19	8.25	11.8	1.43
510.23	0935	11	17.22	727.2	205.5	7.19	9.05	12.4	1.19
511.07	0942	12	17.13	725.9	207.0	7.19	9.05	16.8	1.61
511.81	0951	13	16.90	724.3	207.5	7.18	11.1	15.4	1.49
512.62	0958	14	16.86	722.9	209.7	7.18	11.1	17.4	1.69
513.55	1006	15	17.03	727.5	166.2	7.18	10.7	15.2	1.46
514.30	1014	16	16.81	723.7	118.1	7.19	10.2	15.4	1.49
514.79	1020	16.5	16.97	726.3	116.7	7.19	10.6	17.7	1.68
514.79	1020	well	DRY						
1/15/14 504.31	0842		START						
506.30	0858	1	15.21	709.7	101.6	7.20	1.55	27.3	2.72
507.21	0905	2	16.29	726.7	85.1	7.19	1.60	22.8	2.24
508.03	0912	3	17.13	742.5	64.4	7.17	1.90	21.1	2.03
	0913		SAMPLING						
									1.75 2400 gals purged from tubing 0832 / 1/15/14 0853

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GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL GWM			SNL/NM Project No.: 146422.10.11.03			
Calibrations done by: R Lynch			Date: 1/9/14			
Make & Model: YSI EXO 1						
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167						
YSI 650 MDS (S/N): NA						
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:	0639	4.01	18.25	7.00	18.26	10.00
2. Time:	1052	4.02	18.3	7.00	18.3	10.00
3. Time:						
4. Time:						
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	
SC Calibration						
Reference Value: 1225 uS			Standard Lot No.: 3AE221			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0649	1225	18.72			
2. Time:	1054	1226	18.5			
3. Time:						
4. Time:						
ORP Calibration						
Reference Value: 200 mV			Standard Lot No: 1305755			
	Value	Temp	Expiration Date: 1/14			
1. Time:	0645	200.10	18.07			
2. Time:	1053	200.16	18.11			
3. Time:						
4. Time:						
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft		Atmospheric Pressure in Hg			
1. Time:	0701	81.20	24.3			
2. Time:	1051	81.33	24.3			
3. Time:						
4. Time:						

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

SNL/NM Project Name: CWL GWM		Project No.: 146422.10.11.03		
Calibration done by: R Lynch		Date: 1/9/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	20 10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time	0820	9.45	19.5	93.8
2. Time	0940	9.61	19.8	97.6
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.: 146422.10.11.03				
Calibrations done by: R Lynch			Date: 1/10/14				
Make & Model: YSI EXO 1							
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167							
YSI 650 MDS (S/N): NA							
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:	0637	3.99	18.4	7.00	18.4	10.01	18.4
2. Time:	1030	4.01	18.8	7.00	18.7	10.00	18.7
3. Time:							
4. Time:							
Standard lot no.:	3AD782		3AE725		3AD357		
Expiration date:	4/15		5/15		4/15		
SC Calibration							
Reference Value: 1225 uS			Standard Lot No.: 3AE221				
	Value	Temp	Expiration Date: 5/15				
1. Time:	0640	1224	18.5				
2. Time:	1032	1227	18.8				
3. Time:							
4. Time:							
ORP Calibration							
Reference Value: 200 mV			Standard Lot No. 1305755				
	Value	Temp	Expiration Date: 1/14				
1. Time:	0638	200.1	18.5				
2. Time:	1031	200.4	18.8				
3. Time:							
4. Time:							
DO Calibration							
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg				
1. Time:	0636	81.41	24.20				
2. Time:	1029	81.4	24.22				
3. Time:							
4. Time:							

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

SNL/NM Project Name: CWL GWM		Project No.: 146422.10.11.03			
Calibration done by: R Lynch		Date: 1/10/14			
TURBIDIMETER					
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010			
Reference Value	RL → 10	20	100	800	
Standard Lot No.	0161	0167	016B	0161	
1. Time	0803	9.92	19.7	98.1	797
2. Time	0940	9.96	19.4	97.9	796
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.: 146422.10.11.03			
Calibrations done by: A. Santillanes			Date: 1/13/2014			
Make & Model: YSI XO 1						
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167						
YSI 650 MDS (S/N): NA						
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:	0640	4.00	18.2	7.00	18.2	10.00
2. Time:	1215	4.01	19.5	7.00	19.3	9.98
3. Time:						
4. Time:						
Standard lot no.:	3AD782		3AE221		3AD357	
Expiration date:	4/15		5/15		1/15	
SC Calibration						
Reference Value: 1225 uS			Standard Lot No.: 3AE221			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0642	1225	18.2			
2. Time:	1208	1225	19.3			
3. Time:						
4. Time:						
ORP Calibration						
Reference Value: 200 mV			Standard Lot No. 1305755			
	Value	Temp	Expiration Date: 1/14			
1. Time:	0644	200.0	18.2			
2. Time:	1204	200.0	19.3			
3. Time:						
4. Time:						
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft		Atmospheric Pressure in Hg			
1. Time:	0646	81.50	24.24			
2. Time:	1201	81.5	24.33			
3. Time:						
4. Time:						

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

SNL/NM Project Name: CWL-GWM		Project No.: 146422.10.11.03		
Calibration done by: A. Santillanes		Date: 1/13/2014		
TURBIDIMETER				
Make & Model: HACH 2100P Hach 2100Q		Serial No. S/N 10060C003010		
Reference Value	✓ 10	20	100	800
Standard Lot No.				
1. Time 0650	9.98	20	99.6	798
2. Time 1220	9.98	20	99.7	796
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.: 146422.10.11.03				
Calibrations done by: R Lynch			Date: 5/14/14				
Make & Model: YSI EXO 1							
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167							
YSI 650 MDS (S/N): NA							
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:	0640	4.02	18.4	6.99	18.4	10.01	18.4
2. Time:	1102	4.01	18.6	7.00	18.6	9.99	18.6
3. Time:	0657	3.99	18.1	6.99	18.1	10.00	18.1
4. Time:	0950	4.00	18.3	6.99	18.3	10.00	18.3
Standard lot no.:	3AD782			3AE725		3AD357	
Expiration date:	4/15			5/15		4/15	
SC Calibration							
Reference Value: 1225 uS			Standard Lot No.: 3AE221				
	Value	Temp	Expiration Date: 5/15				
1. Time:	0642	1222	18.4				
2. Time:	1104	1224	18.6				
3. Time:	0653	1221	18.2				
4. Time:	0952	1222	18.3				
ORP Calibration							
Reference Value: 200 mV			Standard Lot No. 1305755				
	Value	Temp	Expiration Date: 1/14				
1. Time:	0641	199.8	18.4				
2. Time:	1103	200.2	18.6				
3. Time:	0652	200.4	18.3				
4. Time:	0951	200.7	18.4				
DO Calibration							
Calibration Value:		81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0639	81.3	24.48				
2. Time:	1101	81.2	24.45				
3. Time:	0650	82.4	24.91				
4. Time:	0949	82.1	24.88				

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

SNL/NM Project Name: CWL GWM		Project No.: 146422.10.11.03			
Calibration done by: R Lynch		Date: 1/14/14			
TURBIDIMETER					
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010			
Reference Value	RL + 10	20	100	800	
Standard Lot No.	0161	0167	0168	0161	
1. Time	0807	9.94	19.7	103	792
2. Time	1030	9.91	19.6	99.8	794
3. Time	0828	9.90	19.4	101	797
4. Time	0930	9.93	19.6	103	794
Comments:					

Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form

Project Name: <u>CWL</u>	Monitoring Well ID #: <u>BW-5</u>	Date: <u>1-9-13</u> ¹⁴ <u>RL</u> ^{130/14}
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-792</u>	Water Level Indicator ID #: <u>62187</u>
Personnel Performing Decontamination: <u>Alfred Santillanes</u> <u>AS</u> Print Name: Initial: <u>Robert Lynch</u> <u>RL</u> Print Name: Initial:	Personnel Performing Decontamination: <u>Alfred Santillanes</u> <u>AS</u> Print Name: Initial: <u>Robert Lynch</u> <u>RL</u> Print Name: Initial:

Condition of Equipment

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

List of Decontamination Materials

Distilled or Deionized (circle one)	HNO₃
Source: <u>Culligan</u>	Grade: <u>Reagent</u>
Lot Number: <u>12-18-13</u>	UN #: <u>2031</u>
	Manufacturer: <u>AROC</u>
	Lot Number: <u>A0305629</u>

**Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW9</u>	Date: <u>01-10-14</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-792</u>	Water Level Indicator ID #: <u>62187</u>
--	--

<p><u>Personnel Performing Decontamination:</u></p> <p>William Gibson <u>WJG</u> Print Name: Initial:</p> <p>Alfred Santillanes <u>AS</u> Print Name: Initial:</p>	<p><u>Personnel Performing Decontamination:</u></p> <p>William Gibson <u>WJG</u> Print Name: Initial:</p> <p>Alfred Santillanes <u>AS</u> Print Name: Initial:</p>
---	---

Condition of Equipment		
Pump: <u>Good</u>	Tubing Bundle: <u>Good</u>	Water Level Indicator: <u>Good</u>

List of Decontamination Materials

<p align="center">Distilled or Deionized (circle one)</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>121813</u></p>	<p align="center">HNO₃</p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>AROC</u></p> <p>Lot Number: <u>A0305629</u></p>
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**Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW11</u>	Date: <u>01-13-14</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-792</u>	Water Level Indicator ID #: <u>62187</u>
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<p><u>Personnel Performing Decontamination:</u></p> <p>Alfred Santillanes Print Name: _____ Initial: <u>AS</u></p> <p>William Gibson Print Name: _____ Initial: <u>WG</u></p>	<p><u>Personnel Performing Decontamination:</u></p> <p>Alfred Santillanes Print Name: _____ Initial: <u>AS</u></p> <p>William Gibson Print Name: _____ Initial: <u>WG</u></p>
--	--

Condition of Equipment		
Pump: <u>Good</u>	Tubing Bundle: <u>Good</u>	Water Level Indicator: <u>Good</u>

List of Decontamination Materials

<p align="center">Distilled or Deionized (circle one)</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>12/18/13</u></p>	<p align="center">HNO₃</p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>AROC</u></p> <p>Lot Number: <u>A0305629</u></p>
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SUMMARY SHEET FOR JANUARY 2014 SAMPLES

Sample Summary for CWL GWM
January 2014

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: Project Task # 146422.10.11.03. Service Order # CF 327-14								
Environmental Samples								
CWL-BW5	9-Jan-14	615185	095107	Environmental	615184 / 095104	615185 / 095109	615185 / 095106	
CWL-BW5	9-Jan-14	615185	095108	Duplicate	615184 / 095104	615185 / 095109	615185 / 095106	
CWL-MW9	10-Jan-14	615187	095112	Environmental	n/a	615187 / 095113	n/a	
CWL-MW10	15-Jan-14	615191	095121	Environmental	n/a	615191 / 095122	615191 / 095120	
CWL-MW11	13-Jan-14	615189	095116	Environmental	n/a	615189 / 095117	n/a	
CWL-EB1	8-Jan-14	615184	095104	Equipment Blank	n/a	615184 / 095105	n/a	Decon prior to CWL-BW5
CWL-FB1	8-Jan-14	615184	095103	QC - DI water	n/a	615184 / 095105	n/a	DI source water
CWL-FB2	9-Jan-14	615185	095106	Field Blank	n/a	615185 / 095109	n/a	at CWL-BW5
CWL-FB3	15-Jan-14	615191	095120	Field Blank	n/a	615191 / 095122	n/a	at CWL-MW10
Waste Characterization Samples								
CWL-BW5	9-Jan-14	615186	095110	Waste	n/a	615186 / 095111	n/a	No data validation required
CWL-MW9	10-Jan-14	615188	095114	Waste	n/a	615188 / 095115	n/a	No data validation required
CWL-MW10	15-Jan-14	615192	095123	Waste	n/a	615192 / 095124	n/a	No data validation required
CWL-MW11	13-Jan-14	615190	095118	Waste	n/a	615190 / 095119	n/a	No data validation required

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

GROUNDWATER MONITORING

JANUARY 2014

AR/COC NUMBERS 615184 and 615185

Memorandum

Date: February 11, 2014
To: File
From: Linda Thal
Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 615184 and 615185
SDG: 341106
Laboratory: GEL
Project/Task: 146422.10.11.03
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 resulted 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 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 CCV %Ds were >20% with positive bias for trichlorofluoromethane and trichlorotrifluoroethane. The associated sample results were NDs and will not be qualified.

Blanks

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

Chloroform was detected at > the PQL in the EB, sample 341106002 and in the FB, sample -005. The associated sample results were NDs and will not be qualified.

Chloroform was detected at > the PQL in the FB sample -001. No samples were associated with this FB.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met. It should be noted that the MS/MSD analyses were performed on a sample of similar matrix from ARCOG 615186. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

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

A TB and a FB was submitted with each AR/COC. An EB was submitted with AR/COC 615184 and was applied to the samples submitted with AR/COC 615185. A field duplicate pair was submitted with AR/COC 615185. 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.

Reviewed by: Mary Donivan

Level: I

Date: 02/12/14

Memorandum

Date: February 11, 2014
To: File
From: Linda Thal
Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 615184 and 615185
SDG: 341106
Laboratory: GEL
Project/Task: 146422.10.11.03
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

Three samples were prepared and analyzed with approved procedures using method EPA 6020 (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

Holding Times and Preservation

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

ICP-MS Instrument Tune

The ICP-MS tune met QC acceptance criteria.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all 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 of the ICS A and AB analyses were evaluated because the sample concentrations of Ca were > those in the ICS solution. All QC acceptance criteria were met.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria.

Other QC

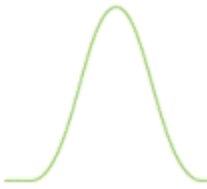
An EB was submitted with AR/COC 615184 and was applied to the samples submitted with AR/COC 615185. A field duplicate pair was submitted with AR/COC 615185. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan

Level: I

Date: 02/12/14



Sample Findings Summary



AR/COC: 615184, 615185

Page 1 of 1

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 #: 615184 and 615185

Site/Project: CWL GWM

Validation Date: 02/11/2014

SDG #: 341106

Laboratory: GEL

Validator: Linda Thal

Matrix: Aqueous

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: Sampled 01/08 and 09/2014; EB to be applied to samples on AR/COC 615185; Samples on ARCO 615186 are not for data validation

Validated by: 

Organic Worksheet (GC/MS)

AR/COC #: 615184 and 615185

SDG #: 341106

Matrix: Aqueous

Laboratory Sample IDs: 341106001, -002, -004, -005, -006, -008, -010

Method/Batch #s: 8260B: 1360659

Tuning (pass/fail): Pass TICs Required? (yes/no): No

Analyte (outliers)	Calibration				Method Blank	5X (10X) MB	LCS %R	MS %R	MSD %R	MS/ MSD RPD	EB -002	TBs- 004 -010	FB -001 DI water	FB -005
	Int.	RF	RSD/ R ²	(ICV) CCV %D										
Trichlorofluoromethane	NA	✓	✓	+20.9	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
Chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	2.58	✓	2.71	2.87
Trichlorotrifluoroethane	NA	✓	✓	+22	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓
Surrogate Recovery Outliers														
Sample ID														
None														
IS Outliers														
Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None														

Comments: HTs OK: ICAL VOA6.I 01/08/2014; 6 TAL only

MS/MSD performed on SNL sample 341106011 from ARCOG 615186 which is not part of DV; spiked with trichlorotrifluoroethane.

EB applies the samples on AR/COC 615185. FB -001 not applied to anything per client request.

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC **615184**

Project Name: CWL GWM	Date Samples Shipped: 1/9/14	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. 793543	SMO Contact Phone: Lorraine Herrera/505-844-3199	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/808-556-8171	Send Report to SMO: Rita Kavanaugh/505-284-2553	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: CF327-14	Lab Destination: GEL		
	Contract No.: PO 1303873		

Tech Area: _____
 Building: _____ Room: _____ Operational Site: _____
 Bill to: Sandia National Laboratories (Accounts Payable),
 P.O. Box 5800, MS-0154
 Albuquerque, NM 87185-0154 **341106**

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
095103	-001	CWL-FB1	NA	1/8/14	13:00	DIW	G	3x40 ml	HCL	G	FB	VOCs (SW846-8260)	001
095104	-001	CWL-EB1	NA	1/8/14	13:00	DIW	G	3x40 ml	HCL	G	EB	VOCs (SW846-8260)	002
095104	-015	CWL-EB1	NA	1/8/14	13:01	DIW	P	500 ml	HNO3	G	EB	Chromium, Nickel (SW846-6020)	003
095105	-001	CWL-TB1	NA	1/8/14	13:00	DIW	G	3x40 ml	HCL	G	TB	VOCs (SW846-8260)	004

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC initials:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	William Gibson	<i>[Signature]</i>	WG	SNL/4142/505-284-3307/505-239-7367	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/505-284-2547
	Robert Lynch	<i>[Signature]</i>	RL	SNL/4142/505-844-4013/505-250-7090	
Alfred Santillanes	<i>[Signature]</i>	AS	SNL/4142/505-844-5130/505-228-0710		
					VOC's: Report CWL enhanced list of compounds, (Chloroform, 1,1-DCE,PCE,TCE,Freon 11, and Freon 113)

1. Relinquished by <i>[Signature]</i> Org. 4142 Date 1-9-14 Time 10:08	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. 4142 Date 1/9/14 Time 1008	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>[Signature]</i> Org. 4142 Date 1/9/14 Time 1100	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>[Signature]</i> Org. 666 Date 1-10-14 Time 0735	4. Received by _____ Org. _____ Date _____ Time _____

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.

SMO Use

AR/COC **615185**

Project Name: CWL GWM	Date Samples Shipped: 1/9/14	SMO Authorization: <i>Douglas</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. 213543	SMO Contact Phone: Lorraine Herrera/505-844-3199	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/808-556-8171	Send Report to SMO: Rita Kavanaugh/505-284-2553	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: CF327-14	Lab Destination: GEL		
	Contract No.: PO 1303873		

Tech Area: _____
 Building: _____ Room: _____ Operational Site: _____
 Bill to: Sandia National Laboratories (Accounts Payable),
 P.O. Box 5800, MS-0154
 Albuquerque, NM 87185-0154 341106

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
				Type	Volume								
095106	-001	CWL-FB2	NA	1/9/14	9:25	DIW	G	3x40 ml	HCL	G	FB	VOCs (SW846-8260)	005
095107	-001	CWL-BW5	521	1/9/14	9:25	GW	G	3x40 ml	HCL	G	SA	VOCs (SW846-8260)	006
095107	-015	CWL-BW5	521	1/9/14	9:27	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	007
095108	-001	CWL-BW5	521	1/9/14	9:25	GW	G	3x40 ml	HCL	G	DU	VOCs (SW846-8260)	008
095108	-015	CWL-BW5	521	1/9/14	9:27	GW	P	500 ml	HNO3	G	DU	Chromium, Nickel (SW846-6020)	009
095109	-001	CWL-TB2	NA	1/9/14	9:25	DIW	G	3x40 ml	HCL	G	TB	VOCs (SW846-8260)	010

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day	
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal	Return Samples By:
	William Gibson	<i>William Gibson</i>	WG	SNL/4142/505-284-3307/505-239-7367	<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	
	Robert Lynch	<i>Robert Lynch</i>		SNL/4142/505-844-4013/505-250-7090		Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547
	Alfred Santillanes	<i>Alfred Santillanes</i>	AS	SNL/4142/505-844-5130/505-228-0710		VOCs: Report CWL enhanced list of compounds, (Chloroform, 1,1-DCE, PCE, TCE, Freon 11, and Freon 113)

1. Relinquished by <i>Alfred Santillanes</i> Org. 4142 Date 1-9-14 Time 10:12	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>Douglas</i> Org. 4142 Date 1/9/14 Time 10:12	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>Douglas</i> Org. 4142 Date 1/9/14 Time 11:00	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>Alfred Santillanes</i> Org. GEL Date 1-10-14 Time 0735	4. Received by _____ Org. _____ Date _____ Time _____

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

AR/COC NUMBER 615187

Memorandum

Date: February 17, 2014
To: File
From: Linda Thal
Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 615187
SDG: 341182
Laboratory: GEL
Project/Task: 146422.10.11.03
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 resulted 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 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 CCV %D was >20% with positive bias for trichlorotrifluoroethane. The associated sample results were NDs and will not be qualified.

Blanks

No target analytes were detected in the blanks.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met. It should be noted that the MS/MSD analyses were performed on a sample of similar matrix from AR/COC 615188. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

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

A TB was submitted with AR/COC 615187.

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donivan

Level: I

Date: 02/17/14

Memorandum

Date: February 17, 2014
To: File
From: Linda Thal
Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 615187
SDG: 341182
Laboratory: GEL
Project/Task: 146422.10.11.03
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 EPA 6020 (ICP-MS). Data were reported for all required analytes. Problems were identified with the data package that resulted in the qualification of data.

1. Ni was detected in the ICS A at a negative value with an absolute value > the MDL but $\leq 2X$ the MDL. The associated sample result was a detect <50X the ICS A value and will be **qualified J-,CK3**.

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 ICP-MS tune met QC acceptance criteria.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria. It should be noted that the MS analyses were performed on a sample of similar matrix from AR/COC 615188. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria. It should be noted that the replicate analyses were performed on a sample of similar matrix from AR/COC 615188. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

The LCS met all 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 of the ICS A and AB analyses were evaluated because the sample concentrations of Ca were > those in the ICS solution. All QC acceptance criteria were met except as noted above in the Summary section.

ICP Serial Dilution

The serial dilution met all QC acceptance criteria. It should be noted that the serial dilution analyses were performed on a sample of similar matrix from AR/COC 615188. No sample data will be qualified as a result.

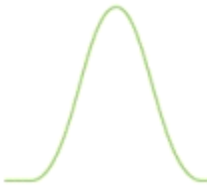
Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Mary Donovan

Level: I

Date: 02/17/14



Sample Findings Summary



AR/COC: 615187

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL	095112-015/CWL-MW9	Nickel (7440-02-0)	J-, CK3

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

Data Validation Summary Worksheet

AR/COC #: 615187

Site/Project: CWL GWM

Validation Date: 02/17/2014

SDG #: 341182

Laboratory: GEL

Validator: Linda Thal

Matrix: Aqueous

of Samples: 3 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: Sampled 01/10/2014; Samples on ARCOG 615188 are not for data validation

Validated by: 

Organic Worksheet (GC/MS)

AR/COC #: 615187

SDG #: 341182

Matrix: Aqueous

Laboratory Sample IDs: 341182001 and -003

Method/Batch #: 8260B: 1361700

Tuning (pass/fail): Pass TICs Required? (yes/no): No

Analyte (outliers)	Calibration				Method Blank	5X (10X) MB	LCS %R	MS %R	MSD %R	MS/ MSD RPD	TB -003			
	Int.	RF	RSD/ R ²	(ICV) CCV %D										
Trichlorotrifluoroethane	NA	✓	✓	+27	✓	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: HTs OK: ICAL VOA6.I 01/08/2014; 6 TAL only

MS/MSD performed on SNL sample 341180001 from ARCOG 615188 which is not part of DV; spiked with trichlorotrifluoroethane.

Inorganic Metals Worksheet

AR/COC #: 615187

SDG #: 341182

Matrix: Aqueous

Laboratory Sample IDs: 341182002

Method/Batch #: **3005A/6020**: 1359655(pre)/1359656

ICPMS Mass Cal (pass/fail): Pass

ICPMS Resolution (pass/fail): Pass

Analyte (outliers)	Calibration						Method Blank mg/L	5X Blank or (5X MDL) mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL ug/L x50 (mg/L)	CRA CRI %R				
	Int. mg/L	R ²	ICV	CCV	ICB ug/L	CCB ug/L													
Ni	NA	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	-.78(-.039)	✓				

IS Outliers 60-125%				IS Outliers 80-120%			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HTs OK; All matrix QC on sample 341180002 from AR/COC 615188; Ca>100 000 ppb for sample -002

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.	SMO Use	AR/COC	615187
Project Name: CWL GWM	Date Samples Shipped: 1/10/14	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. 213609	SMO Contact Phone: Lorraine Herrera/505-844-3199	
Project/Task Number: 146422.10.11.03	Lab Contact: Edie Kent/808-556-8171	Send Report to SMO: Rita Kavanaugh/505-284-2553	
Service Order: CF327-14	Lab Destination: GEL	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius	
	Contract No.: PO 1303873	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 341182	

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
✓ 095112	-001	CWL-MW9	516	1/10/14	9:29	GW	G	3x40 ml	HCL	G	SA	VOCs (SW846-8260)	001
✓ 095112	-015	CWL-MW9	516	1/10/14	9:30	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	002
✓ 095113	-001	CWL-TB4	NA	1/10/14	9:29	DIW	G	3x40 ml	HCL	G	TB	VOCs (SW846-8260)	003

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	William Gibson	<i>[Signature]</i>	WG	SNL/4142/505-284-3307/505-239-7367	Return Samples By: Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547 VOCs: Report CWL enhanced list of compounds, (Chloroform, 1,1-DCE,PCE,TCE,Freon11,and Freon 113).
	Robert Lynch	<i>[Signature]</i>	RL	SNL/4142/505-844-4013/505-250-7090	
Alfred Santillanes	<i>[Signature]</i>	AS	SNL/4142/505-844-5130/505-228-0710		

1. Relinquished by <i>[Signature]</i> Org. 4142 Date 1/10/14 Time 10:04	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. 4142 Date 1/10/14 Time 10:04	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>[Signature]</i> Org. 4142 Date 1/10/14 Time 11:00	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>[Signature]</i> Org. GEL Date 1-11-14 Time 1010	4. Received by _____ Org. _____ Date _____ Time _____

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

AR/COC NUMBERS 615189 and 615191

Memorandum

Date: February 19, 2014
To: File
From: Linda Thal
Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 615189 and 615191
SDG: 341236
Laboratory: GEL
Project/Task: 146422.10.11.03
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 resulted 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 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 with the following exception. Chloroform was detected at > the PQL in the FB, sample 341236004. The associated sample result was 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)

All MS/MSD acceptance criteria were met. It should be noted that the MS/MSD analyses were performed on a sample of similar matrix from AR/COC 615190. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

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

Two TBs were submitted, one with each AR/COC. A FB was submitted with AR/COC 615191.

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski

Level I

Date: 02/21/14

Memorandum

Date: February 19, 2014
To: File
From: Linda Thal
Subject: Inorganic Data Review and Validation – SNL
Site: CWL GWM
AR/COC: 615189 and 615191
SDG: 341236
Laboratory: GEL
Project/Task: 146422.10.11.03
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). Data were reported for all required analytes. No problems were identified with the data package that resulted in the qualification of data.

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

Holding Times and Preservation

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

ICP-MS Instrument Tune

The ICP-MS tune met QC acceptance criteria.

Calibration

All initial and continuing calibration met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria. It should be noted that the MS analyses were performed on a sample of similar matrix from AR/COC 615190. No sample data will be qualified as a result.

Laboratory Replicate

The replicate met all QC acceptance criteria. It should be noted that the replicate analyses were performed on a sample of similar matrix from AR/COC 615190. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

The LCS met all 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 of the ICS A and AB analyses were evaluated because the concentrations of Ca were > those in the ICS solution for sample 341236002. All QC acceptance criteria were met.

ICP Serial Dilution

The serial dilution met all QC acceptance criteria. It should be noted that the serial dilution analyses were performed on a sample of similar matrix from AR/COC 615190. No sample data will be qualified as a result.

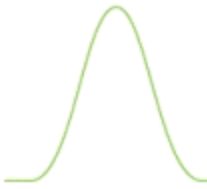
Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski

Level I

Date: 02/21/14



Sample Findings Summary



AR/COC: 615189, 615191

Page 1 of 1

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 #: 615189 and 615191

Site/Project: CWL GWM

Validation Date: 02/19/2014

SDG #: 341236

Laboratory: GEL

Validator: Linda Thal

Matrix: Aqueous

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: Sampled 01/13 and 15/2014; Samples on ARCOG 615190 and 615192 are not for data validation

Validated by: 

Organic Worksheet (GC/MS)

AR/COC #: 615189 and 615191

SDG #: 341236

Matrix: Aqueous

Laboratory Sample IDs: 341236001, -003, -004, -005 and -007

Method/Batch #: 8260B: 1362014

Tuning (pass/fail): Pass TICs Required? (yes/no): No

Analyte (outliers)	Calibration				Method Blank	5X (10X) MB	LCS %R	MS %R	MSD %R	MS/ MSD RPD	TB -003 -007	FB -004	FB X5	
	Int.	RF	RSD/ R ²	(ICV) CCV %D										
Chloroform	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	2.82	14.1	
Surrogate Recovery Outliers														
Sample ID														
None														
IS Outliers														
Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None														

Comments: HTs OK: ICAL VOA6.I 01/08/2014; 6 TAL only; CCVs trichlorotrifluoroethane 20.4 and 20.1%D OK

MS/MSD performed on SNL sample 341235001 from ARCOG 615190 which is not part of DV; spiked with trichlorotrifluoroethane.

Inorganic Metals Worksheet

AR/COC #: 615189 and 615191

SDG #: 341236

Matrix: Aqueous

Laboratory Sample IDs: 341236002 and -006

Method/Batch #: **3005A/6020**: 1360741(prepare)/1360742

ICPMS Mass Cal (pass/fail): Pass

ICPMS Resolution (pass/fail): Pass

Analyte (outliers)	Calibration						Method Blank mg/L	5X Blank or (5X MDL) mg/L	LCS %R	MS %R	Lab Rep RPD	Serial Dil. %D	ICS AB %R	ICS A ± MDL ug/L x50 (mg/L)	CRA CRI %R				
	Int. mg/L	R ²	ICV	CCV	ICB ug/L	CCB ug/L													
None																			

IS Outliers 60-125%				IS Outliers 80-120%			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HTs OK; All matrix QC on sample 341235002 from AR/COC 615190; Ca>100 000 ppb for sample -002 only

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Page 1 of 1

Batch No.		SMO Use		AR/COC 615189	
Project Name:	CWL GWM	Date Samples Shipped:	1/13/14	SMO Authorization:	<i>Don Watson</i>
Project/Task Manager:	Tim Jackson	Carrier/Waybill No.:	213629	SMO Contact Phone:	
Project/Task Number:	146422.10.11.03	Lab Contact:	Edie Kent/808-556-8171	Lorraine Herrera/505-844-3199	
Service Order:	CF327-14	Lab Destination:	GEL	Send Report to SMO:	
Tech Area:		Contract No.:	PO 1303873	Rita Kavanaugh/505-284-2553	
Building:	Room:	Operational Site:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
✓ 095116	-001	CWL-MW11	513	1/13/14	10:54	GW	G	3x40 ml	HCL	G	SA	VOCs (SW846-8260)	
✓ 095116	-015	CWL-MW11	513	1/13/14	10:55	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	
✓ 095117	-001	CWL-TB6	NA	1/13/14	10:54	DIW	G	3x40 ml	HCL	G	TB	VOCs (SW846-8260)	

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt		
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		Entered by:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Background: <input type="checkbox"/> Yes		QC inits.:		Negotiated TAT		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day					
Confirmatory: <input type="checkbox"/> Yes		Name		Signature		Init.		Company/Organization/Phone/Cell		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	
Sample Team Members	William Gibson		<i>William Gibson</i>		WJG		SNL/4142/505-284-3307/505-239-7367		Return Samples By: Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547 VOCs: Report CWL enhanced list of compounds. (Chloroform, 1,1-DCE, PCE, TCE, Freon11, and Freon 113).		
	Robert Lynch		<i>Robert Lynch</i>		RL		SNL/4142/505-844-4013/505-250-7090				
	Alfred Santillanes		<i>Alfred Santillanes</i>		AS		SNL/4142/505-844-5130/505-228-0710				
	Gilbert Quintana		<i>Gilbert Quintana</i>		GQ		SNL/4143/505-284-2507/505-228-2606				
1. Relinquished by <i>Alfred Santillanes</i>		Org. 4142		Date 1-13-14		Time 11:27		3. Relinquished by		Org. Date Time	
1. Received by <i>Don Watson</i>		Org. 4142		Date 1/13/14		Time 12:00/127		3. Received by		Org. Date Time	
2. Relinquished by <i>Don Watson</i>		Org. 4142		Date 1/13/14		Time 12:00		4. Relinquished by		Org. Date Time	
2. Received by		Org.		Date		Time		4. Received by		Org. Date Time	

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.		SMO Use		AR/COC 615189	
Project Name: CWL GWM		Date Samples Shipped: <u>1/13/14</u>		SMO Authorization: <u>Don Watson</u>	
Project/Task Manager: Tim Jackson		Carrier/Waybill No. <u>213629</u>		SMO Contact Phone: <u>Lorraine Herrera/505-844-3199</u>	
Project/Task Number: 146422.10.11.03		Lab Contact: Edie Kent/808-556-8171		Send Report to SMO: <input checked="" type="checkbox"/> 4° Celsius	
Service Order: CF327-14		Lab Destination: GEL		Rita Kavanaugh/505-284-2553	
Contract No.: PO 1303873				Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 341236	
Tech Area:		Operational Site:			
Building:		Room:			

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
✓ 095116	-001	CWL-MW11	513	1/13/14 10:54	GW	G	3x40 ml	HCL	G	SA	VOCs (SW846-8260)	001
✓ 095116	-015	CWL-MW11	513	1/13/14 10:55	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	002
✓ 095117	-001	CWL-TB6	NA	1/13/14 10:54	DIW	G	3x40 ml	HCL	G	TB	VOCs (SW846-8260)	003

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt		
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		Entered by:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Background: <input type="checkbox"/> Yes		QC inits.:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		Negotiated TAT <input type="checkbox"/>					
Confirmatory: <input type="checkbox"/> Yes		Init.		Company/Organization/Phone/Cell		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab					
Sample Team Members	Name		Signature		Init.		Company/Organization/Phone/Cell		Return Samples By:		
	William Gibson				WG		SNL/4142/505-284-3307/505-239-7367		Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547 VOCs: Report CWL enhanced list of compounds, (Chloroform, 1,1-DCE, PCE, TCE, Freon11, and Freon 113).		
	Robert Lynch				RL		SNL/4142/505-844-4013/505-250-7090				
	Alfred Santillanes				AS		SNL/4142/505-844-5130/505-228-0710				
Gilbert Quintana				GQ		SNL/4143/505-284-2507/505-228-2606					
1. Relinquished by		Org. 4142		Date 1-13-14		Time 11:27		3. Relinquished by		Org. Date Time	
1. Received by		Org. 4142		Date 1/13/14		Time 1200		3. Received by		Org. Date Time	
2. Relinquished by		Org.		Date		Time		4. Relinquished by		Org. Date Time	
2. Received by		Org. GEL		Date 1-14-14		Time 0720		4. Received by		Org. Date Time	

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

S/MO Use

AR/COC **615191**

Project Name: <u>CWL GWM</u>	Date Samples Shipped: <u>1/15/14</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: <u>Tim Jackson</u>	Carrier/Waybill No.: <u>213295</u>	SMO Contact Phone: <u>Lorraine Herrera/505-844-3199</u>	<input type="checkbox"/> RMMA
Project/Task Number: <u>146422.10.11.03</u>	Lab Contact: <u>Edie Kent/808-556-8171</u>	Send Report to SMO: <u>Rita Kavanaugh/505-284-2553</u>	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: <u>CF327-14</u>	Lab Destination: <u>GEL</u>		
	Contract No.: <u>PO 1303873</u>		

Tech Area: <u>115/14</u>	Building: <u>008</u>	Room: <u>008</u>	Operational Site: <u>341236</u>
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Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
095120	-001	CWL-FB3	NA	1/15/14 9:13	DIW	G	3x40 ml	HCL	G	FB	VOCs (SW846-8260)	004
095121	-015	CWL-MW10	515	1/15/14 9:13	GW	G	3x40 ml	HCL	G	SA	VOCs (SW846-8260)	005
095121	-0015	CWL-MW10	515	1/15/14 9:14	GW	P	500 ml	HNO3	G	SA	Chromium, Nickel (SW846-6020)	006
095122	-001	CWL-TB8	NA	1/15/14 9:13	DIW	G	3x40 ml	HCL	G	TB	VOCs (SW846-8260)	007

Last Chain: <input checked="" type="checkbox"/> Yes	Sample Tracking	S/MO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Lab Use
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day	
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>	
Sample Team Members Name: <u>William Gibson</u> Signature: <u>[Signature]</u> Init: <u>[Init]</u> Company/Org/Phone/Cell: <u>SNL/4142/505-284-3307/505-239-7367</u> Name: <u>Robert Lynch</u> Signature: <u>[Signature]</u> Init: <u>[Init]</u> Company/Org/Phone/Cell: <u>SNL/4142/505-844-4013/505-250-7090</u> Name: <u>Alfred Santillanes</u> Signature: <u>[Signature]</u> Init: <u>[Init]</u> Company/Org/Phone/Cell: <u>SNL/4142/505-844-5130/505-228-0710</u>	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab		Return Samples By:	
	Comments: <u>Send Report to Tim Jackson/4142/MS 0729/505-284-2547</u>			
	VOCs: Report CWL enhanced list of compounds, (Chloroform, 1,1-DCE, PCE, TCE, Freon 11, and Freon 113).			

1. Relinquished by <u>Alfred Santillanes</u> Org. <u>4142</u> Date <u>1/15/14</u> Time <u>0952</u>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <u>Edie Kent</u> Org. <u>4142</u> Date <u>1/15/14</u> Time <u>0952</u>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>Edie Kent</u> Org. <u>4142</u> Date <u>1/15/14</u> Time <u>1030</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>Edie Kent</u> Org. <u>GEL</u> Date <u>1-16-14</u> Time <u>0745</u>	4. Received by _____ Org. _____ Date _____ Time _____

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

CONTRACT VERIFICATION REVIEW FORMS
GROUNDWATER MONITORING
JANUARY 2014

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
615184	Environmental*
615185	Environmental*
615186	Waste
615187	Environmental*
615188	Waste
615189	Environmental*
615190	Waste
615191	Environmental*
615192	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_10.11.03
 ARCO No. 615184, 615185, 615186 Analytical Lab GEL SDG No. 341106

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?		If no, explain
		Yes	No	
1.1	All items on ARCO 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?		If no, explain
		Yes	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	Holding 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 sample accuracy reported and met for all samples		X	VOC LCS recovery failed for 1,2,4-Trichlorobenzene, Dichlorofluoromethane (QC1203020537)
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	VOC MS recovery failed for Dichlorofluoromethane (QC1203020535); Metals MS recovery failed for Potassium (QC1203017755); MS recovery failed for Total Phenol (QC1203017809)
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	Molybdenum detected in Metals Method Blank (QC1203017752)
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloroform detected in FB1 (095103-001), EB1 (095104-001), FB2 (095106-001)
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; "N" - result associated with spike analysis outside control limits	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), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
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		

Contract Verification Review (Continued)

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)	N/A		
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	X		
a) Instrument run logs provided			

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

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

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? 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: 02/11/2014

Were resolutions adequate and data package complete? Yes No

Closed by: _____ Date: _____

Contract Verification Review (CVR)

Project Leader Jackson Project Name CWL GWM Project/Task No. 146422_10.11.01
 ARCOG No. 615187, 615188 Analytical Lab GEL SDG No. 341180

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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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?		If no, explain
		Yes	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	Holding 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 sample accuracy reported and met for all samples		X	VOC LCS 1203023213 recovery failed for Dichlorodifluoromethane
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	Molybdenum detected in Metals Method Blank (QC1203018247)
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; "N" - result associated with spike analysis outside control limits	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), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
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)	N/A		
a) Initial calibration provided			
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	X		
a) Instrument run logs provided			

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

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

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? 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: 02/11/2014

Were resolutions adequate and data package complete? Yes No

Closed by: _____ Date: _____

Contract Verification Review (CVR)

Project Leader Jackson Project Name CWL GWM Project/Task No. 146422_10.11.03
 ARCO No. 615189, 615190, 615191, 615192 Analytical Lab GEL SDG No. 341235

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?		If no, explain
		Yes	No	
1.1	All items on ARCO 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?		If no, explain
		Yes	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	Holding 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 sample accuracy reported and met for all samples		X	VOC LCS 1203024553 recovery failed for 2-Hexanone
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	Acetone detected in VOC Method Blank (1203024552); Molybdenum detected in Metals Method Blank (QC1203020754)
b) Sampling blank (e.g., field, trip, and equipment) data reported and met		X	Chloroform detected in FB3 (095120-001)
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; "N" - result associated with spike analysis outside control limits	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), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
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		

Contract Verification Review (Continued)

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)	N/A		
a) Initial calibration provided			
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	X		
a) Instrument run logs provided			

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

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

6.0 Problem Resolution

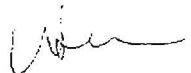
Summarize the findings in the table below. List only samples/fractions for which deficiencies have been noted.

Sample/Fraction No.	Analysis	Problems/Comments/Resolutions

Were deficiencies unresolved? 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: 01/18/2014

Were resolutions adequate and data package complete? Yes No

Closed by: _____ Date: _____

FIELD SAMPLING FORMS
JULY 2014 GROUNDWATER MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-BW5 Date: 7/7/14 Time: 0757

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

Weather Conditions:
 Temp: 86.6 °F Wind Speed: 0 MPH Humidity: 44.6 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules T1
 Other: 7-15-14

Safety Topics Presented

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

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

Attendees

Robert Lynch
 Printed Name

Robert Lynch
 Signature

ALFRED SANTILLANOS
 Printed Name

Alfred Santillanos
 Signature

William Gibson
 Printed Name

William Gibson
 Signature

 Printed Name

 Signature

 Printed Name

 Signature

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW9 Date: 7/8/14 Time: 0750

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

Weather Conditions:
Temp: 82.0 °F Wind Speed: 10-15 MPH Humidity: 35.1 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules 3/15/14
Other: _____

Safety Topics Presented

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

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

Attendees

Robert Lynch
Printed Name

Robert Lynch
Signature

ALFRED SANTILLANOS
Printed Name

Alfred Santillanos
Signature

William Gibson
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William Gibson
Signature

Printed Name

Signature

Printed Name

Signature

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW11 Date: 7/9/14 Time: 0728

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

Weather Conditions:
Temp: 87.0 °F Wind Speed: 0 MPH Humidity: 36.5 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampoules ^{TA}
Other: 7-15-14

Safety Topics Presented

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

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

Attendees

Robert Lynch
Printed Name

Robert Lynch
Signature

ALFRED SANTILLANES
Printed Name

Alfred Santillanes
Signature

William Gibson
Printed Name

William Gibson
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Printed Name

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Signature

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TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL-MW1D Date: 7/10/14 Time: 0746

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

Weather Conditions:
Temp: 77.7°F Wind Speed: 0 MPH Humidity: 46.6 % Wind Chill NA°F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC ampules 7-15-14
Other: _____

Safety Topics Presented

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

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

Attendees

Robert Lynch
Printed Name

[Signature]
Signature

ALFRED SANTILLANOS
Printed Name

[Signature]
Signature

William Gibson
Printed Name

[Signature]
Signature

Robert Lynch
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[Signature]
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William Gibson
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ALFRED SANTILLANOS
Printed Name

[Signature]
Signature

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7/11/14

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL			SNL/NM Project No.: 146422.10.11.03			
Calibrations done by: R Lynch			Date: 7/7/14			
Make & Model: YSI EXO1						
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167						
YSI 650 MDS (S/N): NA						
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:	0645	4.01	23.1	6.99	23.1	10.00
2. Time:	1212	4.01	23.4	7.00	23.4	10.00
3. Time:						
4. Time:						
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	
SC Calibration						
Reference Value: 1225 uS			Standard Lot No.: 3AE221			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0647	1225	23.1			
2. Time:	1211	1227	23.4			
3. Time:						
4. Time:						
ORP Calibration						
Reference Value: 220 mV			Standard Lot No. 4AA010			
	Value	Temp	Expiration Date: 7/14			
1. Time:	0646	220.0	23.3			
2. Time:	1213	219.9	23.4			
3. Time:						
4. Time:						
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0644	81.8	24.48			
2. Time:	1210	81.7	24.50			
3. Time:						
4. Time:						

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

SNL/NM Project Name: CWL		Project No.: 146422.10.11.03		
Calibration done by: R Lynch		Date: 7/7/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	RL ^{7/7/14} + 10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time	0759	10.1	19.7	103
2. Time	1125	10.3	19.9	99.6
3. Time				
4. Time				
Comments:				

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG

Page 1 of 2

SNL/NM Project Name: CWL			SNL/NM Project No.: 146422.10.11.03			
Calibrations done by: R Lynch			Date: 7/8/14			
Make & Model: YSI EX01						
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167						
YSI 650 MDS (S/N): NA						
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:	0642 4.01	21.3	6.99 21.3	21.3	10.00 21.3	21.3
2. Time:	1317 4.00	21.7	7.00 21.7	21.7	10.01 21.7	21.7
3. Time:						
4. Time:						
Standard lot no	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	
SC Calibration						
Reference Value	1225 uS		Standard Lot No. 3AE221			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0641 1227	21.3				
2. Time:	1316 1230	21.7				
3. Time:						
4. Time:						
ORP Calibration						
Reference Value:	220 mV		Standard Lot No. 4AA010			
	Value	Temp	Expiration Date: 7/14			
1. Time:	0643 220.1	21.3				
2. Time:	1318 220.4	21.7				
3. Time:						
4. Time:						
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0640 81.7		24.47			
2. Time:	1315 81.9		24.49			
3. Time:						
4. Time:						

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

SNL/NM Project Name: CWL		Project No.: 146422.10.11.03		
Calibration done by: R Lynch		Date: 7/8/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	7/4/14 RL + 10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time	0953	10.2	19.9	104
2. Time	1150	9.99	19.6	101
3. Time				
4. Time				
Comments:				

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL			SNL/NM Project No.: 146422.10.11.03			
Calibrations done by: R Lynch			Date: 7/9/14			
Make & Model: YSI EXO1						
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167						
YSI 650 MDS (S/N): NA						
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:	0622	4.02	21.1	7.00	21.1	10.01
2. Time:	1432	4.01	21.7	7.01	21.8	10.02
3. Time:						
4. Time:						
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	
SC Calibration						
Reference Value: 1225 uS			Standard Lot No.: 3AE221			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0621	1229	21.1			
2. Time:	1431	1231	21.8			
3. Time:						
4. Time:						
ORP Calibration						
Reference Value: 220 mV			Standard Lot No 4AA010			
	Value	Temp	Expiration Date 7/14			
1. Time:	0623	219.7	21.1			
2. Time:	1433	220.4	21.8			
3. Time:						
4. Time:						
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0620	81.6	24.46			
2. Time:	1430	81.8	24.50			
3. Time:						
4. Time:						

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

SNL/NM Project Name: CWL		Project No.: 145422.10.11.03		
Calibration done by: R Lynch		Date: 7/9/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	RL 7-9-14 10	20	100	800
Standard Lot No.	0161	0167	0168	0161
1. Time 0730	10.3	19.6	108	795
2. Time 1313	9.99	19.7	104	793
3. Time				
4. Time				
Comments:				

GROUNDWATER SAMPLE COLLECTION FIELD EQUIPMENT CHECK LOG Page 1 of 2

SNL/NM Project Name: CWL			SNL/NM Project No.: 148422.10.11.03			
Calibrations done by: R Lynch			Date: 7/10/14 7/11/14			
Make & Model: YSI EX01						
YSI 6820 Sonde (S/N) with DO, Ec, pH, ORP, and temperature probes: 13C101167						
YSI 650 MDS (S/N): NA						
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	3.99	20.3	6.99	20.3	10.00
2. Time:	1327	4.01	20.8	7.01	20.8	10.00
3. Time:	0642	4.01	20.2	7.00	20.2	9.98
4. Time:	1030	4.02	20.3	6.99	20.2	9.99
Standard lot no.:	3AD782		3AE725		3AD357	
Expiration date:	4/15		5/15		4/15	
SC Calibration						
Reference Value	1225 uS		Standard Lot No.: 3AE221			
	Value	Temp	Expiration Date: 5/15			
1. Time:	0632	1227	20.3			
2. Time:	1326	1229	20.8			
3. Time:	0641	1225	20.2			
4. Time:	1030	1224	20.3			
ORP Calibration						
Reference Value:	220 mV		Standard Lot No. 4AA010			
	Value	Temp	Expiration Date: 7/14			
1. Time:	0634	219.8	20.3			
2. Time:	1328	220.4	20.8			
3. Time:	0644	219.6	20.0			
4. Time:	1032	220.1	20.3			
DO Calibration						
Calibration Value:	81% air saturation @ 5200 ft.		Atmospheric Pressure in Hg			
1. Time:	0631	81.8	24.57			
2. Time:	1325	81.9	24.55			
3. Time:	0640	81.4	24.46			
4. Time:	1029	81.5	24.46			

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

SNL/NM Project Name: CWL		Project No.: 146422.10.11.03		
Calibration done by: R Lynch		Date: 7/10/14 7/11/14		
TURBIDIMETER				
Make & Model: HACH 2100P HACH 2100Q		Serial No. S/N 10060C003010		
Reference Value	20 ⁷⁻¹⁰⁻¹⁴ 10	20	100	800
Standard Lot No.	0161	0167	0165	0161
1. Time	0750	10.1	19.7	104
2. Time	1240	9.99	20.1	99.9
3. Time	0805	9.97	19.6	102
4. Time	0917	9.94	19.8	104
Comments:				

**Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-BW5</u>	Date: <u>07 / 07 / 14</u>
------------------------------	--------------------------------------	---------------------------

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

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>210269</u>
<p>Personnel Performing Decontamination:</p> <p>Robert Lynch _____ <u>RL</u> Print Name: Initial:</p> <p>William Gibson _____ <u>WJG</u> Print Name: Initial:</p>	<p>Personnel Performing Decontamination:</p> <p>Robert Lynch _____ <u>RL</u> Print Name: Initial:</p> <p><u>William Gibson</u> _____ <u>WJG</u> Robert Lynch Print Name: Initial: <u>1/6/14</u></p>

Condition of Equipment

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

List of Decontamination Materials

<p align="center">Distilled or Deionized (circle one)</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>062414</u></p>	<p align="center">HNO₃</p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>AROC</u></p> <p>Lot Number: <u>A0316863</u></p>
--	--

**Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW9</u>	Date: <u>7/8/14</u>
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03		
Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>210269</u>	
<u>Personnel Performing Decontamination:</u>		<u>Personnel Performing Decontamination:</u>
Robert Lynch Print Name: _____	<u>RL</u> Initial:	Robert Lynch Print Name: _____
Alfred Santillanes Print Name: _____	<u>AS</u> Initial:	Alfred Santillanes Print Name: _____
Condition of Equipment		
Pump: <u>Excellent</u>	Tubing Bundle: <u>Excellent</u>	Water Level Indicator: <u>Good</u>
List of Decontamination Materials		
Distilled or Deionized (circle one)	HNO₃	
Source: <u>Culligan</u>	Grade: <u>Reagent</u>	
Lot Number: <u>062414</u>	UN #: <u>2031</u>	
	Manufacturer: <u>AROC</u>	
	Lot Number: <u>A0316863</u>	

**Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW11</u>	Date: <u>7/9/14</u>
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The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03

Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>210269</u>
<u>Personnel Performing Decontamination:</u> William Gibson <u>WJG</u> Print Name: Initial: Alfred Santillanes <u>AS</u> Print Name: Initial:	<u>Personnel Performing Decontamination:</u> William Gibson <u>WJG</u> Print Name: Initial: Alfred Santillanes <u>AS</u> Print Name: Initial:

Condition of Equipment

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

List of Decontamination Materials

<p align="center">Distilled or Deionized (circle one)</p> <p>Source: <u>Culligan</u></p> <p>Lot Number: <u>062414</u></p>	<p align="center">HNO₃</p> <p>Grade: <u>Reagent</u></p> <p>UN #: <u>2031</u></p> <p>Manufacturer: <u>AROC</u></p> <p>Lot Number: <u>A0316863</u></p>
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**Portable Pump and Tubing / Water Level Indicator
Decontamination Log Form**

Project Name: <u>CWL-GWM</u>	Monitoring Well ID #: <u>CWL-MW10</u>	Date: <u>7-11-13</u>
The following equipment was decontaminated at completion of sampling activities in accordance with FOP-05-03		
Pump and Tubing Bundle ID #: <u>1806-640</u>	Water Level Indicator ID #: <u>210269</u>	
<u>Personnel Performing Decontamination:</u> Robert Lynch _____ <u>RL</u> Print Name: Initial: William Gibson _____ <u>WJG</u> Print Name: Initial:		<u>Personnel Performing Decontamination:</u> Robert Lynch _____ <u>RL</u> Print Name: Initial: William Gibson _____ <u>WJG</u> Print Name: Initial:
Condition of Equipment		
Pump: <u>Excellent</u> Tubing Bundle: <u>Excellent</u> Water Level Indicator: <u>Good</u>		
List of Decontamination Materials		
<p align="center">Distilled or Deionized (circle one)</p> Source: <u>Culligan</u> Lot Number: <u>062414</u>	<p align="center">HNO₃</p> Grade: <u>Reagent</u> UN #: <u>2031</u> Manufacturer: <u>AROC</u> Lot Number: <u>A0316863</u>	

SUMMARY SHEET FOR JULY 2014 SAMPLES

Sample Summary for CWL GWM
July 2014

Sample ID	Sample Date	ARCOG	Sample Number	Sample Type	Associated Equipment Blank (ARCOG #/Sample #)	Associated Trip Blank (ARCOG # / Sample #)	Associated Field Blank (ARCOG # / Sample #)	Comments
CWL GWM: Project Task # 146422.10.11.03. Service Order # CF 327-14								
Environmental Samples								
CWL-BW5	7-Jul-14	615599	096179	Environmental	n/a	615599 / 096180	615599 / 096178	
CWL-MW9	8-Jul-14	615601	096184	Environmental	615607 / 096199	615601 / 096186	615601 / 096183	
CWL-MW9	8-Jul-14	615601	096185	Duplicate	615607 / 096199	615601 / 096186	615601 / 096183	
CWL-MW10	11-Jul-14	615605	096195	Environmental	n/a	615605 / 096196	615605 / 096194	
CWL-MW11	9-Jul-14	615603	096190	Environmental	n/a	615603 / 096191	615603 / 096189	
CWL-EB1	7-Jul-14	615607	096199	Equipment Blank	n/a	615607 / 096200	n/a	Decon prior to CWL-MW9
CWL-FB1	7-Jul-14	615599	096178	Field Blank	n/a	615599 / 096180	n/a	at CWL-BW5
CWL-FB2	8-Jul-14	615601	096183	Field Blank	n/a	615601 / 096186	n/a	at CWL-MW9
CWL-FB3	9-Jul-14	615603	096189	Field Blank	n/a	615603 / 096191	n/a	at CWL-MW11
CWL-FB4	11-Jul-14	615605	096194	Field Blank	n/a	615605 / 096196	n/a	at CWL-MW10
Waste Characterization Samples								
CWL-BW5	7-Jul-14	615600	096181	Waste	n/a	615600 / 096182	n/a	No data validation required
CWL-MW9	8-Jul-14	615602	096187	Waste	n/a	n/a	n/a	No data validation required
CWL-MW10	11-Jul-14	615606	096197	Waste	n/a	n/a	n/a	No data validation required
CWL-MW11	9-Jul-14	615604	096192	Waste	n/a	n/a	n/a	No data validation required

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

GROUNDWATER MONITORING

JULY 2014

AR/COC NUMBERS 615599, 615601, 615603, and 615607



Sample Findings Summary



AR/COC: 615599, 615601, 615603, 615607

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
SW846 3005/6020 DOE-AL			
	096179-015/CWL-BW5	Nickel (7440-02-0)	J-, CK3
	096184-015/CWL-MW9	Nickel (7440-02-0)	J-, CK3
	096185-015/CWL-MW9	Nickel (7440-02-0)	J-, CK3
	096190-015/CWL-MW11	Nickel (7440-02-0)	J-, CK3

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

Memorandum

Date: August 21, 2014
To: File
From: Mary Donovan
Subject: Inorganic Data Review and Validation – SNL
Site: CWL-GWM
AR/COC: 615599, 615601, 615603 and 615607
SDG: 352131
Laboratory: GEL
Project/Task: 146422.10.11.03
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 4.

Summary

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

1. The Ca concentrations for all samples *except* 352131012 were comparable to or above the ICS levels for the ICP-MS analysis. The ICS A result for Ni was negative with an absolute value >2X the MDL. The associated sample results were detects at <50X the absolute value of the associated ICS A result and will be **qualified J-,CK3** due to a negative ICS A results.

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 ICP-MS tune met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the samples met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all 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)

The results for the ICSA and ICSAB met acceptance criteria except as noted above in the Summary section.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria.

Other QC

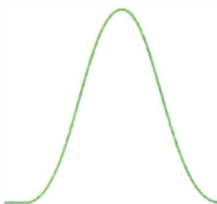
An EB was submitted with ARCOG 615607, and it was associated with samples from 615601. A field duplicate pair was submitted with ARCOG 615601. There are no "required" review criteria for field duplicate analyses comparability; no data will be qualified as a result.

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski

Level I

Date: 09/22/14



Memorandum

Date: August 21, 2014
To: File
From: Mary Donovan
Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL-GWM
AR/COC: 615599, 615601, 615603 and 615607
SDG: 352125
Laboratory: GEL
Project/Task: 146422.10.11.03
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 4.

Summary

Twelve samples were prepared and analyzed with accepted procedures for trichloroethylene using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted 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 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 except as follows. Trichloroethylene was detected at a concentration > the PQL in the FB, sample 352131014. The associated sample result was a non-detect 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)

All MS/MSD acceptance criteria were met.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

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 were submitted, one associated with each ARCO. FBs were submitted with ARCOs 615599, 615601 and 615603 and were associated with the samples in their respective ARCOs. An EB was submitted with ARCO 615607, and it was associated with samples from 615601. A field duplicate pair was submitted with ARCO 615601. 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.

Reviewed by: Monica Dymerski

Level I

Date: 09/22/14

Data Validation Summary Worksheet

AR/COC #: 615599, 615601, 615603 and 605607

Site/Project: CWL-GWM

Validation Date: 08/21/2014

SDG #: 352131

Laboratory: GEL Laboratories, LLC

Validator: Mary Donovan

Matrix: Aqueous

of Samples: 17 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: Samples collected 07/07 through 07/09/2014

Revised 7/2007

Validated By: Mary A. Donovan

Inorganic Metals Worksheet

AR/COC #: 615599, 615601, 615603 and 615607

SDG #: 352131

Matrix: Aqueous

Laboratory Sample IDs: 35213103, -007, -009, -012 and -016

Method/Batch #s: **3005A/6020** (ICP-MS): 1402927(pre)/1402928

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	EB -012				
	Int.	R ²	ICV	CCV	ICB	CCB														
Ni	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	-1.35	✓	✓					

IS Outliers 60-125%				IS Outliers 80-120%			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HTs OK. Matrix QC performed on -003

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. <i>N/A</i>	SMO Use	AR/COC	615599
Project Name: CWL-GWM	Date Samples Shipped: <i>7/7/14</i>	SMO Authorization: <i>[Signature]</i>	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>220635</i>	SMO Contact Phone: <i>[Signature]</i>	
Project/Task Number: 146422/10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	
Service Order: CF <i>025-14</i> <i>327 emc 7/8/14</i>	Lab Destination: GEL	Send Report to SMO: Rita Kavanaugh/505-284-2553	
Contract No.: PO 1303873		<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius	

Tech Area:	Operational Site:	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 <i>352131</i>
Building:	Room:	

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
096178	-001	CWL-FB 1	N/A	7/7/14	11:15	DIW	G	3x40ml	HCL	G	FB	TCE (SW846-8260B)	<i>001</i>
096179	-001	CWL-BW5	521	7/7/14	11:15	GW	G	3x40ml	HCL	G	SA	TCE (SW846-8260B)	<i>002</i>
096179	-015	CWL-BW5	521	7/7/14	11:16	GW	P	500 mL	HNO3	G	SA	Chromium Nickel (SW846-6920)	<i>003</i>
096180	-001	CWL-TB 1	N/A	7/7/14	11:15	DIW	G	3x40ml	HCL	G	TB	TCE (SW846-8260B)	<i>004</i>

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC initials:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	SNL/4142/505-844-5130/505-228-0710	
	William Gibson	<i>[Signature]</i>	<i>WG</i>	SNL/4142/505-284-3307/505-239-7367	

1. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>7/7/14</i> Time <i>1135</i>	3. Relinquished by	Org.	Date	Time
1. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>7/8/14</i> Time <i>1135</i>	3. Received by	Org.	Date	Time
2. Relinquished by <i>[Signature]</i> Org. <i>4142</i> Date <i>7/7/14</i> Time <i>1200</i>	4. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. <i>4142</i> Date <i>7-8-14</i> Time <i>0815</i>	4. Received by	Org.	Date	Time

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC **615601**

Project Name: CWL-GWM	Date Samples Shipped: <u>7/8/14</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <u>220818</u>	SMO Contact Phone: <u>[Signature]</u>	<input type="checkbox"/> RMMA
Project/Task Number: 146422/10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: CF 327-14	Lab Destination: GEL	Send Report to SMO: Rita Kavanaugh/505-284-2553	
	Contract No.: PO 1303873		

Bill to: Sandia National Laboratories (Accounts Payable),
P.O. Box 5800, MS-0154 352131
Albuquerque, NM 87185-0154 325131

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
096183	-001	CWL-FB 2	N/A	7/8/14 11:46	DIW	G	3x40ml	HCL	G	FB	TCE (SW846-8260B)	005
096184	-001	CWL-MW9	516	7/8/14 11:46	GW	G	3x40ml	HCL	G	SA	TCE (SW846-8260B)	006
096184	-015	CWL-MW9	516	7/8/14 11:48	GW	P	500 ml	HNO3	G	SA	Chromium Nickel (SW846-6020)	007
096185	-001	CWL-MW9	516	7/8/14 11:46	GW	G	3x40ml	HCL	G	DU	TCE (SW846-8260B)	008
096185	-015	CWL-MW9	516	7/8/14 11:48	GW	P	500 ml	HNO3	G	DU	Chromium Nickel (SW846-6020)	009
096186	-001	CWL-TB 4	N/A	7/8/14 11:46	DIW	G	3x40ml	HCL	G	TB	TCE (SW846-8260B)	010

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day	
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal	Return Samples By:	Comments:
	Robert Lynch	<u>[Signature]</u>	RL	SNL/4142/505-844-4013/505-250-7090	<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab		
Alfred Santillanes	<u>[Signature]</u>	AS	SNL/4142/505-844-5130/505-228-0710				
William Gibson	<u>[Signature]</u>	WG	SNL/4142/505-284-3307/505-239-7367				

1. Relinquished by <u>[Signature]</u> Org. 4142 Date <u>7/8/14</u> Time <u>1210</u>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <u>[Signature]</u> SMO Org. 4142 Date <u>7/8/14</u> Time <u>1210</u>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. 4142 Date <u>7/8/14</u> Time <u>1200</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>[Signature]</u> Org. <u>GEL</u> Date <u>7-9-14</u> Time <u>0750</u>	4. Received by _____ Org. _____ Date _____ Time _____

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC **615603**

Project Name: <u>CWL-GWM</u>	Date Samples Shipped: <u>7/10/14</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: <u>Tim Jackson</u>	Carrier/Waybill No. <u>220856</u>	SMO Contact Phone: <u>[Signature]</u>	<input type="checkbox"/> RMMA
Project/Task Number: <u>146422/10.11.03</u>	Lab Contact: <u>Edie Kent/803-556-8171</u>	Lorraine Herrera/505-844-3199	<input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Service Order: <u>CF 327-14</u>	Lab Destination: <u>GEL</u>	Send Report to SMO: <u>Rita Kavanaugh/505-284-2553</u>	
	Contract No.: <u>PO 1303873</u>		

Bill to: Sandia National Laboratories (Accounts Payable),
P.O. Box 5800, MS-0154
Albuquerque, NM 87185-0154 352131

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
096189	-001	CWL-FB 3	N/A	7/9/14	13:07	DIW	G	3x40ml	HCL	G	FB	TCE (SW846-8260)	<u>014</u>
096190	-001	CWL-MW11	513	7/9/14	13:07	GW	G	3x40ml	HCL	G	SA	TCE (SW846-8260)	<u>015</u>
096190	-015	CWL-MW11	513 <u>515</u>	7/9/14	13:09	GW	P	500 mL	HNO3	G	SA	Chromium Nickel (SW846-6020)	<u>016</u>
096191	-001	CWL-TB 6	N/A	7/9/14	13:07	DIW	G	3x40ml	HCL	G	TB	TCE (SW846-8260)	<u>017</u>

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<u>[Signature]</u>	<u>RL</u>	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: <u>Send report to Tim Jackson/4142/MS 0729/284-2547</u>
	Alfred Santillanes	<u>[Signature]</u>		SNL/4142/505-844-5130/505-228-0710	
	William Gibson	<u>[Signature]</u>	<u>WJG</u>	SNL/4142/505-284-3307/505-239-7367	

1. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/9/14</u> Time <u>1335</u>	3. Relinquished by	Org.	Date	Time
1. Received by <u>[Signature]</u> Org. <u>SMO</u> Date <u>7/9/14</u> Time <u>1335</u>	3. Received by	Org.	Date	Time
2. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/10/14</u> Time <u>0805</u>	4. Relinquished by	Org.	Date	Time
2. Received by <u>[Signature]</u> Org. <u>CEL</u> Date <u>7-11-14</u> Time <u>0725</u>	4. Received by	Org.	Date	Time

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. MA

SMO Use

AR/COC **615607**

Project Name: CWL-GWM	Date Samples Shipped: <u>7/8/14</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization <input type="checkbox"/> RMMA <input type="checkbox"/> Released by COC No. <input checked="" type="checkbox"/> 4° Celsius
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <u>220818</u>	SMO Contact Phone: <u>[Signature]</u>	
Project/Task Number: 146422/10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	
Service Order: CF 028-14	Lab Destination: GEL	Send Report to SMO: Rita Kavanaugh/505-284-2553	
Tech Area: <u>7/8/14</u>	Contract No.: PO 1303873	Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 <u>352/31</u>	

Building: _____ Room: _____ Operational Site: _____

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected		Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
							Type	Volume					
096199	-001	CWL-EB 1	N/A	7/7/14	13:23	DIW	G	3x40ml	HCL	G	EB SA	TCE (SW846-8260B)	011
096199	-015	CWL-EB 1	N/A	7/7/14	13:24	DIW	P	500 mL	HNO3	G	EB SA	Chromium Nickel (SW846-6920)	012
096200	-001	CWL-TB 3	N/A	7/7/14	13:23	DIW	G	3x40ml	HCL	G	TB	TCE (SW846-8260B)	013

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day	
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>	

Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal
		Robert Lynch	<u>[Signature]</u>	RL	SNL/4142/505-844-4013/505-250-7090
	Alfred Santillanes	<u>[Signature]</u>	AS	SNL/4142/505-844-5130/505-228-0710	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	William Gibson	<u>[Signature]</u>	WG	SNL/4142/505-284-3307/505-239-7367	

1. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/7/14</u> Time <u>13:43</u>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/7/14</u> Time <u>13:43</u>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/8/14</u> Time <u>0800</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>[Signature]</u> Org. <u>CCR</u> Date <u>7/8/14</u> Time <u>0750</u>	4. Received by _____ Org. _____ Date _____ Time _____

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

AR/COC NUMBER 615605

Memorandum

Date: August 26, 2014
To: File
From: Mary Donovan
Subject: Inorganic Data Review and Validation – SNL
Site: CWL-GWM
AR/COC: 615605
SDG: 352883
Laboratory: GEL
Project/Task: 146422.10.11.03
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 4.

Summary

One sample was prepared and analyzed for Cr and Ni with approved procedures using method EPA 6020 (ICP-MS). Data were reported for all required analytes. No problems were identified with the data package that resulted 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 ICP-MS tune met QC acceptance criteria.

Calibration

All initial and continuing calibration criteria met QC acceptance criteria.

Reporting Limit Verification

All CRA/CRI recoveries associated with the sample met QC acceptance criteria.

It should be noted that the CRI was analyzed at the PQL and not at 2X the PQL for all target analytes.

Blanks

No target analytes were detected in the blanks.

ICP -MS Internal Standards

The ICP-MS internal standards met QC acceptance criteria.

Matrix Spike (MS)

The MS met all QC acceptance criteria.

Laboratory Replicate

The replicate met all QC acceptance criteria.

Laboratory Control Sample (LCS)

The LCS met all 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 of the ICS A and AB analyses were not evaluated because the sample concentrations of Ca, Mg, Al and Fe were < that in the ICS solution.

ICP Serial Dilution

The serial dilutions met all QC acceptance criteria.

Other QC

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski

Level I

Date: 08/27/14

Memorandum

Date: August 25, 2014
To: File
From: Mary Donovan
Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL-GWM
AR/COC: 615605
SDG: 352883
Laboratory: GEL
Project/Task: 146422.10.11.03
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 4.

Summary

Three samples were prepared and analyzed with accepted procedures for trichloroethylene using method EPA 8260B (VOCs). All compounds were successfully analyzed. No problems were identified with the data package that resulted 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 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.

Surrogates

All surrogate recoveries met QC acceptance criteria.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSD acceptance criteria were met. The parent sample for the MS/MSD was an SNL sample from another SDG. No sample data will be qualified as a result.

Laboratory Control Sample (LCS)

All LCS acceptance criteria were met.

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, both associated with the sample in this ARCOG.

No other specific issues that affect data quality were identified.

Reviewed by: Monica Dymerski

Level I

Date: 08/27/14



Sample Findings Summary



AR/COC: 615605

Page 1 of 1

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
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All other analyses met QC acceptance criteria; no further data should be qualified.

Data Validation Summary Worksheet

AR/COC #: 615605

Site/Project: CWL-GWM

Validation Date: 08/25/2014

SDG #: 352883

Laboratory: GEL Laboratories, LLC

Validator: Mary Donovan

Matrix: Aqueous

of Samples: 4 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
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: Samples collected 07/11/2014

Revised 7/2007

Validated By: Mary A. Donovan

Inorganic Metals Worksheet

AR/COC #: 615605

SDG #: 352131

Matrix: Aqueous

Laboratory Sample IDs: 35213103, -007, -009, -012 and -016

Method/Batch #: **3005A/6020** (ICP-MS): 1402927(prepare)/1402928

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	EB -012				
	Int.	R ²	ICV	CCV	ICB	CCB														
Ni	✓	✓	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	-1.35	✓	✓					

IS Outliers 60-125%				IS Outliers 80-120%			
Sample ID	%Recovery	%Recovery	%Recovery	CCV/CCB ID	%Recovery	%Recovery	%Recovery
None				None			

Comments: HTs OK. Matrix QC performed on -003

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No.	SMO Use	AR/COC	615605
Project Name: CWL-GWM	Date Samples Shipped: <u>7/16/14</u>	SMO Authorization: <u>[Signature]</u>	
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <u>22/213</u>	SMO Contact Phone: <u>[Signature]</u>	
Project/Task Number: 146422/10.11.03	Lab Contact: Edie Kent/803-556-8171	Lorraine Herrera/505-844-3199	
Service Order: CF 327-14	Lab Destination: GEL	Send Report to SMO:	
	Contract No.: PO 1303873	Rita Kavanaugh/505-284-2553	

<input type="checkbox"/> Waste Characterization
<input type="checkbox"/> RMMA
<input type="checkbox"/> Released by COC No.
<input checked="" type="checkbox"/> 4° Celsius
Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154 <u>352883</u>

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
096194	-001	CWL-FB 4	N/A	7/11/14 9:09	DIW	G	3x40ml	HCL	G	FB	TCE (SW846-8260)	001
096195	-001	CWL-MW10	515	7/11/14 9:09	GW	G	3x40ml	HCL	G	SA	TCE (SW846-8260)	002
096195	-015	CWL-MW10	515	7/11/14 9:11	GW	P	500 mL	HNO3	G	SA	Chromium Nickel (SW846-6020)	003
096196	-001	CWL-TB 8	N/A	7/11/14 9:09	DIW	G	3x40ml	HCL	G	TB	TCE (SW846-8260)	004

Last Chain: <input checked="" type="checkbox"/> Yes <u>*</u>	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	Robert Lynch	<u>[Signature]</u>	RL	SNL/4142/505-844-4013/505-250-7090	Return Samples By: Comments: Send report to Tim Jackson/4142/MS 0729/284-2547
	Alfred Santillanes	<u>[Signature]</u>	AS	SNL/4142/505-844-5130/505-228-0710	
	William Gibson	<u>[Signature]</u>	WG	SNL/4142/505-284-3307/505-239-7367	

1. Relinquished by <u>Alfred Santillanes</u> Org. <u>4142</u> Date <u>7/16/14</u> Time <u>1009</u>	3. Relinquished by	Org.	Date	Time
1. Received by <u>[Signature]</u> Org. <u>4142</u> Date <u>7/16/14</u> Time <u>1009</u>	3. Received by	Org.	Date	Time
2. Relinquished by <u>Donald [Signature]</u> Org. <u>4142</u> Date <u>7/16/14</u> Time <u>1100</u>	4. Relinquished by	Org.	Date	Time
2. Received by <u>[Signature]</u> Org. <u>4142</u> Date <u>7-17-14</u> Time <u>0750</u>	4. Received by	Org.	Date	Time

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

CONTRACT VERIFICATION REVIEW FORMS
GROUNDWATER MONITORING
JULY 2014

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
615599	Environmental*
615600	Waste
615601	Environmental*
615602	Waste
615603	Environmental*
615604	Waste
615605	Environmental*
615606	Waste
615607	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 GWM Project/Task No. 146422_10.11.03
 ARCO No. 615599, 615600, 615601, 615602, 615603, 615604, 615607 Analytical Lab GEL SDG No. 352125

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?		If no, explain
		Yes	No	
1.1	All items on ARCO 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?		If no, explain
		Yes	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	Holding 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	X		
a) Laboratory control sample 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	X		
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		X	Calcium detected in Metals Method Blank (1203126289)
a) Method or reagent blank data reported and met for all samples		X	Detected in FB3: Trichloroethylene (096189-001)
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; "N" - result associated with spike analysis outside control limits	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), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
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	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		

Contract Verification Review (Continued)

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)	N/A		
a) Initial calibration provided			
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	X		
a) Instrument run logs provided			

Contract Verification Review (Concluded)

5.0 Data Anomaly Report

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

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? Yes No

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

If no, provide nonconformance report or correction request number 18030 and date correction request was submitted: 09/15/2014

Reviewed by:  Date: 08/20/2014

Were resolutions adequate and data package complete? Yes No

Closed by:  Date: 09/18/2014

Date: 08/25/2014

To: Edie Kent / Jannie Shaw-Busby From: Lorraine Herrera

Company: GEL Org: 4142

Phone: (843) 556-8171 Phone: (505) 844-3199

Fax: (843) 766-1178 Fax: (505) 844-3128

Correction Request

COC: 615599 – 615604, SDG: 352125 Tracking No: 18030
625607

For Metals batch 1402928, the run log is incorrect.

The LCS was analyzed and reported on 8/11/14 @ 20:12:50, but it is ZZZ'd out on the runlog. The sample ID for the LCS is 1203126290.

A corrected runlog is requested.

Thank you,
Lorraine



Sandia National Laboratories
Sample Management Office
P.O. Box 5800
Albuquerque, New Mexico 87185-1331

Contract Verification Review (CVR)

Project Leader Jackson Project Name CWL-GWM Project/Task No. 146422_10.11.03

ARCOC No. 615605, 615606 Analytical Lab GEL SDG No. 352882

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?		If no, explain
		Yes	No	
1.1	All items on ARCOG 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?		If no, explain
		Yes	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	Holding 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 sample accuracy reported and met for all samples		X	VOC LCS recovery failed for 1,2-Dibromo-3-chloropropane, Methylene chloride (1203134975)
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	VOC PS recovery failed for Bromomethane, Methylene chloride (1203134976). MS recovery failed for Total Phenol (1203129826)
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	Calcium detected in Metals Method Blank (1203131101)
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; "N" - result associated with spike analysis outside control limits	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), pesticides/PCBs 8081 and 8082 and herbicides 8151	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
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	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		

Contract Verification Review (Continued)

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)	N/A		
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	X		
a) Instrument run logs provided			

**ANNEX B
Chemical Waste Landfill
CY 2014 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 2014 SOIL-GAS MONITORING

TAILGATE SAFETY MEETING FORM

Dept: 4142 Well Location: CWL Date: 01/16/14 Time: 0855

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

Weather Conditions:
 Temp: 50.4 °F Wind Speed: 25 MPH Humidity: 34 % Wind Chill NA °F

Chemicals Used: Acids in sample containers, standard solutions, Hach ACCU-VAC amputes 7/3/14
 Other: _____

Safety Topics Presented

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

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

Attendees

William Gibson
 Printed Name

William J. Kelly
 Signature

Robert Lynch
 Printed Name

[Signature]
 Signature

Robert H. Quintana
 Printed Name

[Signature]
 Signature

Troy Jackson
 Printed Name

[Signature]
 Signature

Alfred Sattell
 Printed Name

[Signature]
 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
34000519	11/14/14	11/16/14	-28	11/16/14	-8	11/17/14
0504			-28		-8	
0382			-28		-8	
0482			-28		-8	
1661			-26		-8	
1352			-26		-8	FB
0091			-20		-8	
0345			-26		-8	
0017			-26		-8	
0206			-26		-8	
7701			-24		-8	FB
1659			-26		-8	FB
0582			-26		-8	
0022			-22		-6	
1305			-28		-8	
0021			-26		-8	
1397			-28		-8	
0038			-25		-8	FB
1201			-26		-8	
1202			-26		-8	
0108			-28		-8	
0690			-26		-8	
0853			-27		-8	FB
1584			-27		-8	
0119			-26		-8	
0789			-27		-8	
1559			-26		-8	
0823			-27		-8	

SUMMA[®] Canister Log completed by:

Tim Jackson
 Printed Name

T. Jackson
 Signature

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Background = 0.6 ppm

* PID readings are continuous

Soil Vapor Sampling Log

Location	Date	Time	Canister #	PID (ppm)	Starting Vacuum (in. Hg)	Ending Vacuum (in. Hg)	Location Comments
CWL-D1-100	11/6/14	0907	34000519	0.0	-28	-8	Purge / Sample
CWL-D1-160		0909	n/a	0.0	-28	n/a	Purge
↓		0910	↓	↓	↓	↓	↓
↓		0912	34000504	n/a	-28	-8	Sample
CWL-D1-240		0915	n/a	0.1	n/a	n/a	Purge
↓		0916	↓	↓	↓	↓	↓
↓		0917	↓	↓	↓	↓	↓
↓		0918	34000352	n/a	-28	-8	Sample
CWL-D1-350		0920	n/a	0.0	n/a	n/a	Purge
↓		0924	↓	↓	↓	↓	↓
↓		0930	↓	↓	↓	↓	↓
↓		0931	34000482	n/a	-28	-8	Sample
CWL-D1-470		0934	n/a	0.0	n/a	n/a	Purge
↓		↓	↓	↓	↓	↓	↓
↓		0936	↓	↓	↓	↓	↓
↓		0937	34001661	n/a	-28	-8	Sample
CWL-U1-1-40		0953	34000091	0.0	-26	-8	Purge / Sample
CWL-U1-1-50		0957	n/a	0.0	n/a	n/a	Purge
↓		0958	34000345	n/a	-26	-8	Sample
CWL-U1-1-120		1000	n/a	0.00	n/a	n/a	Purge
↓		1001	↓	↓	↓	↓	↓
↓		1002	34000017	n/a	-26	-8	Sample
↓		1004	34000206	↓	-26	-8	Duplicate
CWL-U1-2-36		1022	34000558	0.00	-26	-8	Purge / Sample
CWL-U1-2-76		1026	n/a	0.00	n/a	n/a	Purge
↓		1027	34000072	n/a	-22	-6	Sample
CWL-U1-2-136		1029	n/a	0.0	n/a	n/a	Purge
↓		1030	34001305	n/a	-28	-8	Sample
↓		1037	34000021	↓	-26	-8	Duplicate

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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-D2-120	11/6/14	1053	34001397	0.0	-28	-8	Purge/sample
CWL-D2-240		1056	n/a	0.0	n/a	n/a	Purge
		1057	↓	↓	↓	↓	↓
		1058	34001202	n/a	-26	-8	sample
CWL-D2-350		1101	n/a	0.0	n/a	n/a	Purge
		1102	↓	↓	↓	↓	↓
		1103	↓	↓	↓	↓	↓
		1104	34001202	n/a	-26	-8	sample
CWL-D2-470		1107	n/a	0.0	n/a	n/a	Purge
		1108	↓	↓	↓	↓	↓
		1109	↓	↓	↓	↓	↓
		1110	34000105	n/a	-28	-8	sample
CWL-D2-470		1112	n/a	0.0	n/a	n/a	Purge
		1113	↓	↓	↓	↓	↓
		1114	↓	↓	↓	↓	↓
		1115	34000698	n/a	-26	-8	sample
CWL-D3-120		1136	n/a	0.0	n/a	n/a	Purge
		1137	34001584	n/a	-27	-8	sample
CWL-D3-170		1139	n/a	0.0	n/a	n/a	Purge
		1140	↓	↓	↓	↓	↓
		1141	34000119	n/a	-26	-8	sample
CWL-D3-350		1144	n/a	0.0	n/a	n/a	Purge
		1145	↓	↓	↓	↓	↓
		1146	34000789	n/a	-27	-8	sample
CWL-D3-480		1148	n/a	0.0	n/a	n/a	Purge
		1149	↓	↓	↓	↓	↓
		1150	↓	↓	↓	↓	↓
		1151	34001554	n/a	-26	-8	sample

SUMMARY SHEET FOR CALENDAR YEAR 2014 SAMPLES

**Sample Summary for CWL Soil Vapor Monitoring
FY14**

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 327-14										
CWL-UI1	16-Jan-14	CWL-UI1-40	34000091	615194	095129	Environmental	n/a	n/a	615194 / 095133	
		CWL-UI1-80	34000345		095130	Environmental				
		CWL-UI1-120	34000017		095131	Environmental				
		CWL-UI1-120	34000206		095132	Duplicate				
		CWL-UI1-FB1	34007701		095133	Field QC				n/a
CWL-UI2	16-Jan-14	CWL-UI2-36	34000582	615195	095134	Environmental	n/a	n/a	615195 / 095138	
		CWL-UI2-76	34000022		095135	Environmental				
		CWL-UI2-136	34001305		095136	Environmental				
		CWL-UI2-136	34000021		095137	Duplicate				
CWL-UI2-FB1	34001659	095138	Field QC	n/a	n/a	n/a	Ultra Pure N2			
CWL-D1	16-Jan-14	CWL-D1-100	34000519	615196	095139	Environmental	n/a	n/a	615196 / 095144	
		CWL-D1-160	34000504		095140	Environmental				
		CWL-D1-240	34000382		095141	Environmental				
		CWL-D1-350	34000482		095142	Environmental				
		CWL-D1-470	34001161		095143	Environmental				
		CWL-D1-FB1	34001352		095144	Field QC				n/a
CWL-D2	16-Jan-14	CWL-D2-120	34001397	615197	095145	Environmental	n/a	n/a	615197 / 095150	
		CWL-D2-240	34001201		095146	Environmental				
		CWL-D2-350	34001202		095147	Environmental				
		CWL-D2-440	34000108		095148	Environmental				
		CWL-D2-470	34000698		095149	Environmental				
		CWL-D2-FB1	34000038		095150	Field QC				n/a
CWL-D3	16-Jan-14	CWL-D3-120	34001584	615198	095151	Environmental	n/a	n/a	615198 / 095156	
		CWL-D3-170	34000119		095152	Environmental				
		CWL-D3-350	34000789		095153	Environmental				
		CWL-D3-440	34000823		095154	Environmental				
		CWL-D3-480	34001559		095155	Environmental				
		CWL-D3-FB1	34000853		095156	Field QC				n/a

DATA VALIDATION REPORTS FOR ENVIRONMENTAL SAMPLES

AR/COC NUMBERS 615194, 615195, 615196, 615197, 615198

Memorandum

Date: March 10, 2014

To: File

From: Linda Thal

Subject: GC/MS Organic Data Review and Validation – SNL
Site: CWL-SVM
AR/COC: 615194, 615195, 615196, 615197 and 615198
SDG: 320-5780-1
Laboratory: TestAmerica Laboratories, Inc. -West Sacramento
Project/Task: 146422.10.11.03
Analysis: VOCs by method TO-15

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-15 (Determination of VOCs in Air collected in specially prepared canisters and analyzed by GC-MS). All compounds were successfully analyzed. Problems were identified with the data package that resulted in the qualification of data.

1. Ethylbenzene was detected at < the PQL in the FB, sample 320-5780-5, associated with samples -1 through -4. The associated results for all samples except sample -4 were detects < the PQL and <5X the MB value and will be **qualified 130U,B2** at the PQL.
2. Toluene was detected at > the PQL in the FB, sample 320-5780-5, associated with samples -1 through -4. The associated result for sample -4 was a detect < the PQL and <10X the FB value and will be **qualified 10U,B2** at the PQL. The associated results for samples -1 through -3 were detects > the PQL and <10X the FB and will be **qualified 310U,B2; 280U,B2; 320U,B2** (respectively) at the reported values.
3. o-Xylene was detected at < the PQL in the FB, sample 320-5780-5, associated with samples -1 through -4. The associated results for all samples were detects < the PQL and <5X the MB value and will be **qualified 130U,B2; 130U,B2; 130U,B2 and 10U,B2** (respectively) at the PQL.
4. m,p-Xylene was detected at < the PQL in the FB, sample 320-5780-5, associated with samples -1 through -4. The associated results for all samples except sample -4 were detects ≤ the PQL and <5X the FB value and will be **qualified 260U,B2; 260U,B2 and 270U,B2** (respectively) at the PQL.

5. Acetone was detected at < the PQL in the FB, sample 320-5780-5, associated with samples -1 through -4. The associated results for all samples were detects < the PQL and <10X the FB value and will be **qualified 1600U,B2; 1700U,B2; 1700U,B2 and 130U,B2** (respectively) at the PQL.
6. Acetone was detected at < the PQL in the FB, sample 320-5780-10, associated with samples -6 through -9. The associated results for all samples were detects < the PQL and <10X the FB value and will be **qualified 430U,B2; 490U,B2; 1600U,B2 and 1600U,B2** (respectively) at the PQL.
7. Acetone was detected at < the PQL in the FB, sample 320-5780-16, associated with samples -11 through -15. The associated result for sample -14 was a detect > the PQL and <10X the FB value and will be **qualified 1200U,B2** at the reported value. The remaining associated sample results were detects < the PQL and <10X the FB value and will be **qualified 1600U,B2; 2400U,B2; 2200U,B2 and 22U,B2** (respectively) at the PQL.
8. Acetone was detected at < the PQL in the FB, sample 320-5780-28, associated with samples -23 through -27. The associated results for samples -23, -24 and -27 were detects > the PQL and <10X the FB value and will be **qualified 1400U,B2; 1400U,B2 and 7.4U,B2** (respectively) at the reported value. The associated results for samples -25 and -26 were detects < the PQL and <10X the FB value and both will be **qualified 1600U,B2** at the PQL.
9. Dichlorodifluoromethane was detected at < the PQL in the FB, sample 320-5780-28, associated with samples -23 through -27. The associated result for sample -24 was a detect < the PQL and <5X the FB value and will be **qualified 64U,B2** at the PQL. The associated result for sample -27 was a detect > the PQL and <5X the FB value and will be **qualified 0.57U,B2** at the reported value.

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 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 1,2-dichloro-1,1,2,2-tetrafluoroethane %D was >30% but ≤45% with negative bias for the CCV associated with samples -1 through -3 and -5 through -18. The associated sample results were NDs and since no other calibration infraction occurred, will not be qualified.

Blanks

No target analytes were detected in the blanks except as noted above in the Summary section and as follows.

Ethylbenzene and m,p-xylene were detected at < the PQL in the FB, sample 320-5780-5. The associated results for sample -4 were NDs and will not be qualified.

2-Butanone was detected at < the PQL in the FB, sample 320-5780-16, associated with samples -11 through -15. All associated sample results were NDs and will not be qualified.

Trichloroethene was detected at < the PQL in the FB, sample 320-5780-22, associated with samples -17 through -21. All associated sample results were detects >5X the FB value and will not be qualified.

Dichlorodifluoromethane was detected at < the PQL in the FB, sample 320-5780-28, associated with samples -23 through -27. The associated results for samples -23, -25 and -26 were NDs and will not be qualified.

Surrogates

All surrogate acceptance criteria were met.

Internal Standards

All internal standards met QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

An MS/MSD was not performed.

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

The LCS met all QC acceptance criteria.

Detection Limits/Dilutions

All detection limits were properly reported. The samples were not diluted except as follows.

Sample -1 was diluted 328X and reanalyzed at a 322X for acetone only.

Sample -2 was diluted 331X and reanalyzed at a 331X for acetone only.

Sample -3 was diluted 334X and reanalyzed at a 334X for acetone only.

Sample -4 was diluted 25.6 and reanalyzed at a 320X for trichloroethene only.

Sample -6 was diluted 325X and reanalyzed at a 86.7X for acetone only.

Sample -7 was diluted 306X and reanalyzed at a 98X for acetone only.

Sample -8 was diluted 325X and reanalyzed at a 325X for acetone only.

Sample -9 was diluted 322X and reanalyzed at a 322X for acetone only.

Sample -11 was diluted 314X and reanalyzed at a 314X for acetone only.

Sample -12 was diluted 470X and reanalyzed at a 470X for acetone only.

Sample -13 was diluted 443X and reanalyzed at a 443X for acetone only.

Sample -14 was diluted 442X, reanalyzed at 442X (surrogates only reported) and reanalyzed at a 221X for acetone only.

Sample -15 was diluted 13.4X and reanalyzed at a 4.45X for acetone only.

Sample -17 was diluted 324X and reanalyzed at a 324X for acetone only.

Sample -18 was diluted 328X and reanalyzed at a 273X for acetone only.

Sample -19 was diluted 320X.

Sample -20 was diluted 6.25X.

Sample -21 was diluted 325X (surrogates only reported) and reanalyzed at 130X.

Sample -23 was diluted 164X.

Sample -24 was diluted 161X.
Sample -25 was diluted 324X.
Sample -26 was diluted 328X.

Tentatively Identified Compounds (TICs)

TIC reports were not required.

Other QC

Mass spectra acceptability was not verified during data validation.

Five FBs were submitted, one for each AR/COC. A field duplicate pair was submitted with AR/COC 615194 and 615195. 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.

Reviewed by: Mary Donovan **Level: I** **Date: 03/11/14**



Sample Findings Summary



AR/COC: 615194, 615195, 615196, 615197, 615198

Page 1 of 2

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
TO15	095129-001/CWL-UI1-40	ACETONE (67-64-1)	1600U, B2
	095129-001/CWL-UI1-40	ETHYLBENZENE (100-41-4)	130U, B2
	095129-001/CWL-UI1-40	M,P-XYLENE (179601-23-1)	260U, B2
	095129-001/CWL-UI1-40	O-XYLENE (95-47-6)	130U, B2
	095129-001/CWL-UI1-40	TOLUENE (108-88-3)	310U, B2
	095130-001/CWL-UI1-80	ACETONE (67-64-1)	1700U, B2
	095130-001/CWL-UI1-80	ETHYLBENZENE (100-41-4)	130U, B2
	095130-001/CWL-UI1-80	M,P-XYLENE (179601-23-1)	260U, B2
	095130-001/CWL-UI1-80	O-XYLENE (95-47-6)	130U, B2
	095130-001/CWL-UI1-80	TOLUENE (108-88-3)	280U, B2
	095131-001/CWL-UI1-120	ACETONE (67-64-1)	1700U, B2
	095131-001/CWL-UI1-120	ETHYLBENZENE (100-41-4)	130U, B2
	095131-001/CWL-UI1-120	M,P-XYLENE (179601-23-1)	270U, B2
	095131-001/CWL-UI1-120	O-XYLENE (95-47-6)	130U, B2
	095131-001/CWL-UI1-120	TOLUENE (108-88-3)	320U, B2
	095132-001/CWL-UI1-120	ACETONE (67-64-1)	130U, B2
	095132-001/CWL-UI1-120	O-XYLENE (95-47-6)	130U, B2
	095132-001/CWL-UI1-120	TOLUENE (108-88-3)	10U, B2
	095134-001/CWL-UI2-36	ACETONE (67-64-1)	430U, B2
	095135-001/CWL-UI2-76	ACETONE (67-64-1)	490U, B2
	095136-001/CWL-UI2-136	ACETONE (67-64-1)	1600U, B2
	095137-001/CWL-UI2-136	ACETONE (67-64-1)	1600U, B2
	095139-001/CWL-D1-100	ACETONE (67-64-1)	1600U, B2
	095140-001/CWL-D1-160	ACETONE (67-64-1)	2400U, B2

Analytical Method	Sample ID	Analyte Name (CAS#)	Qualifier, RC
	095141-001/CWL-D1-240	ACETONE (67-64-1)	2200U, B2
	095142-001/CWL-D1-350	ACETONE (67-64-1)	1200U, B2
	095143-001/CWL-D1-470	ACETONE (67-64-1)	22U, B2
	095151-001/CWL-D3-120	ACETONE (67-64-1)	1400U, B2
	095152-001/CWL-D3-170	ACETONE (67-64-1)	1400U, B2
	095152-001/CWL-D3-170	DICHLORODIFLUOROMETHANE (75-71-8)	64U, B2
	095153-001/CWL-D3-350	ACETONE (67-64-1)	1600U, B2
	095154-001/CWL-D3-440	ACETONE (67-64-1)	1600U, B2
	095155-001/CWL-D3-480	ACETONE (67-64-1)	7.4U, B2
	095155-001/CWL-D3-480	DICHLORODIFLUOROMETHANE (75-71-8)	0.57U, B2

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

Data Validation Summary Worksheet

AR/COC #: 615194, 615195, 615196, 615197 and 615198

Site/Project: CWL

Validation Date: 03/11/2014

SDG #: 320-5780-1

Laboratory: TA West Sacramento, CA

Validator: Linda Thal

Matrix: Air

of Samples: 28 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: Collected 01/16/2014

Validated by: 

Organic Worksheet (GC/MS)

AR/COC #: 615194, 615195, 615196, 615197 and 615198

SDG #: 320-5780-1

Matrix: Air

Laboratory Sample IDs: 320-5780-1 through -28

Method/Batch #: TO15: 35856¹; 35915²; 36138³; 36193⁴

Tuning (pass/fail): Pass

TICs Required? (yes/no): NA

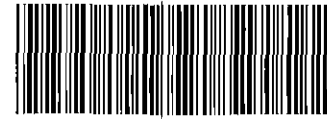
Analyte (outliers)	Calibration				Method Blank	5X (10X) MB	LCS %R	LCSD %R	LCS LCSD RPD					
	Int.	RF	RSD/ R ²	(ICV) CCV %D										
¹ 35856 Acetone reanalyzed										FB -5	FB-10	FB-16		
Acetone	NA	✓	✓	✓	✓	NA	68*	68*	✓					
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NA	✓	✓	-32	✓	NA	✓	✓	✓	✓	✓	✓		
Ethylbenzene	NA	✓	✓	✓	✓	NA	✓	✓	✓	.082J	✓	✓		
Toluene	NA	✓	✓	✓	✓	NA	✓	✓	✓	.45	✓	✓		
m,p-Xylene	NA	✓	✓	✓	✓	NA	✓	✓	✓	.19J	✓	✓		
o-Xylene	NA	✓	✓	✓	✓	NA	✓	✓	✓	.068J	✓	✓		
2-Butanone (MEK)	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	0.3J		
² 35915										FB-22	FB-28			
Trichloroethene	NA	✓	✓	✓	✓	NA	✓	✓	✓	.39J	✓	✓		
Acetone	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	0.96J	✓		
Dichlorodifluoromethane	NA	✓	✓	✓	✓	NA	✓	✓	✓	✓	.18J	✓		
³ 36138										FB -5RA	FB-10RA	FB-16RA		
Acetone	NA	✓	✓	✓	✓	NA	✓	✓	✓	1.1J	1.1J	1.9J		
⁴ 36193 Acetone only														
1,1-Dichloroethene	NA	✓	✓	✓	✓	NA	✓	69**	✓					
Surrogate Recovery Outliers														
Sample ID														
None														
IS Outliers														
Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None														

Comments: No raw data/mass spectra validated. MDLs and RLS reported. Samples spiked with 3 surrogates. Instrument ATMS 2 ICAL 01/31/2014. LCS/LCSD all batches.

*All samples reanalyzed for acetone; ** samples analyzed for acetone only
Cannister Certifications were provided in the data package.

Revised 7/2007

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY



320-5780 Chain of Custody

Internal Lab Page 1 of 1
 Batch No. NA SMO Use AR/COC **615194**

Project Name: CWL-SVM	Date Samples Shipped: <u>1/17/14</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <u>213724</u>	SMO Contact Phone: <u>[Signature]</u>	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: <u>BETH RILEY</u>	Wendy Palencia/505-844-3132	<input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius
Service Order: CF327-14	Lab Destination: TAWest Sacramento	Send Report to SMO: Wendy Palencia/505-844-3132	
	Contract No.: PO 691437		

Tech Area: _____
 Building: _____ Room: _____ Operational Site: _____
 Bill to: Sandia National Laboratories (Accounts Payable),
 P.O. Box 5800, MS-0154
 Albuquerque, NM 87185-0154

Page 1 of 1

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
095129	-001	CWL-UI1-40 (# 34000091)		1/16/14 9:53	SG	SC	6 L	None	G	SA	VOC-TO15	
095130	-001	CWL-UI1-80 (# 34000345)		1/16/14 9:57	SG	SC	6 L	None	G	SA	VOC-TO15	
095131	-001	CWL-UI1-120 (# 34000017)		1/16/14 10:02	SG	SC	6 L	None	G	SA	VOC-TO15	
095132	-001	CWL-UI1-120 (# 34000206)		1/16/14 10:04	SG	SC	6 L	None	G	DU	VOC-TO15	
095133	-001	CWL-UI1-FB1 (# 7701)		1/16/14 10:06	UPN	SC	6 L	None	G	FB	VOC-TO15	

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		EDD		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Background: <input type="checkbox"/> Yes		Entered by:		Turnaround Time		<input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day			
Confirmatory: <input type="checkbox"/> Yes		QC inits.:		Negotiated TAT		<input type="checkbox"/>			
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell		Sample Disposal			Lab Use
	William Gibson	<u>[Signature]</u>	<u>WJG</u>	SNL/4142/505-284-3307/505-239-7367		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
	Robert Lynch	<u>[Signature]</u>	<u>RL</u>	SNL/4142/505-844-4013/505-250-7090		Return Samples By:			
	Alfred Santillanes	<u>[Signature]</u>	<u>AS</u>	SNL/4142/505-844-5130/505-228-0710		Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547			
	Tim Jackson	<u>[Signature]</u>	<u>TJ</u>	SNL/4142/505-284-2547/505-263-6639					
	Gilbert Quintana	<u>[Signature]</u>	<u>GQ</u>	SNL/4143/505-284-2507/505-263-2606					

1. Relinquished by <u>[Signature]</u> Org. 4142 Date 1/17/14 Time 0834	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <u>[Signature]</u> Org. 4142 Date 1/17/14 Time 0834	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. 4142 Date 1/17/14 Time 0945	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>[Signature]</u> Org. _____ Date 1-22-14 Time 915	4. Received by _____ Org. _____ Date _____ Time _____

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. MA SMO Use AR/COG **615195**

Project Name: CWL-SVM	Date Samples Shipped: <u>1/17/14</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No. <u>213724</u>	SMO Contact Phone: <u>920</u>	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: <u>BOTH RILEY</u>	Wendy Palencia/505-844-3132	<input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius
Service Order: CF327-14	Lab Destination: <u>TA/West Sacramento</u>	Send Report to SMO: Wendy Palencia/505-844-3132	
	Contract No.: <u>PO 691437</u>		

Tech Area: _____

Building: _____ Room: _____ Operational Site: _____

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

1601 TO 1601 5821

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
095134	-001	CWL-UI2-36 (# 34000582)		1/16/14 10:22	SG	SC	6 L	None	G	SA	VOC-TO15	
095135	-001	CWL-UI2-76 (# 34000022)		1/16/14 10:27	SG	SC	6 L	None	G	SA	VOC-TO15	
095136	-001	CWL-UI2-136 (# 34001305)		1/16/14 10:30	SG	SC	6 L	None	G	SA	VOC-TO15	
095137	-001	CWL-UI2-136 (# 34000021)		1/16/14 10:32	SG	SC	6 L	None	G	DU	VOC-TO15	
095138	-001	CWL-UI2-FB1 (# 34001659)		1/16/14 10:18	UPN	SC	6 L	None	G	FB	VOC-TO15	

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:				EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Background: <input type="checkbox"/> Yes		Entered by:				Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day			
Confirmatory: <input type="checkbox"/> Yes		QC inits.:				Negotiated TAT <input type="checkbox"/>			
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
	William Gibson	<u>[Signature]</u>	<u>WJG</u>	SNL/4142/505-284-3307/505-239-7367		Return Samples By:			
	Robert Lynch	<u>[Signature]</u>	<u>RL</u>	SNL/4142/505-844-4013/505-250-7090		Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547			
	Alfred Santillanes	<u>[Signature]</u>	<u>AS</u>	SNL/4142/505-844-5130/505-228-0710					
	Tim Jackson	<u>[Signature]</u>	<u>TJ</u>	SNL/4142/505-284-2547/505-263-6639					
Gilbert Quintana	<u>[Signature]</u>	<u>GQ</u>	SNL/4143/505-284-2507/505-263-2606		Lab Use				

1. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>1-17-14</u> Time <u>0834</u>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <u>[Signature]</u> Org. <u>4142</u> Date <u>1-17-14</u> Time <u>0834</u>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>1-17-14</u> Time <u>0945</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>[Signature]</u> Org. _____ Date <u>1-22-14</u> Time <u>915</u>	4. Received by _____ Org. _____ Date _____ Time _____

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. *N/A*

SMO Use

AR/COC **615196**

Project Name: CWL-SVM	Date Samples Shipped: <i>1/17/14</i>	SMO Authorization: <i>[Signature]</i>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: Tim Jackson	Carrier/Waybill No: <i>213724</i>	SMO Contact Phone: <i>[Signature]</i>	<input type="checkbox"/> RMMA
Project/Task Number: 146422.10.11.03	Lab Contact: <i>BVH RLOY</i>	Wendy Palencia/505-844-3132	<input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius
Service Order: CF327-14	Lab Destination: TA/West Sacramento	Send Report to SMO: Wendy Palencia/505-844-3132	
	Contract No.: PO 691437		

Tech Area: _____
 Building: _____ Room: _____ Operational Site: _____
 Bill to: Sandia National Laboratories (Accounts Payable),
 P.O. Box 5800, MS-0154
 Albuquerque, NM 87185-0154

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
095139	-001	CWL-D1-100 (# 34000519)		1/16/14 9:07	SG	SC	6 L	None	G	SA	VOC-TO15	
095140	-001	CWL-D1-160 (# 34000504)		1/16/14 9:12	SG	SC	6 L	None	G	SA	VOC-TO15	
095141	-001	CWL-D1-240 (# 34000382)		1/16/14 9:18	SG	SC	6 L	None	G	SA	VOC-TO15	
095142	-001	CWL-D1-350 (# 34000482)		1/16/14 9:31	SG	SC	6 L	None	G	SA	VOC-TO15	
095143	-001	CWL-D1-470 (# 34001661)		1/16/14 9:37	SG	SC	6 L	None	G	SA	VOC-TO15	
095144	-001	CWL-D1-FB1 (# 34001352)		1/16/14 9:43	UPN	SC	6 L	None	G	FB	VOC-TO15	

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day	
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>	
Sample Team Members:	Company/Organization/Phone/Cell		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab	
William Gibson	SNL/4142/505-284-3307/505-239-7367		Return Samples By:	
Robert Lynch	SNL/4142/505-844-4013/505-250-7090		Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547	
Alfred Santillanes	SNL/4142/505-844-5130/505-228-0710			
Tim Jackson	SNL/4142/505-284-2547/505-263-6639			
Gilbert Quntana	SNL/4143/505-284-2507/505-236-2606			

1. Relinquished by <i>Alfred Santillanes</i> Org. 4142 Date <i>1/17/14</i> Time <i>0834</i>	3. Relinquished by _____ Org. _____ Date _____ Time _____
1. Received by <i>[Signature]</i> Org. 4142 Date <i>1/17/14</i> Time <i>0834</i>	3. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <i>[Signature]</i> Org. 4142 Date <i>1/17/14</i> Time <i>0945</i>	4. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <i>[Signature]</i> Org. _____ Date <i>1-22-14</i> Time <i>915</i>	4. Received by _____ Org. _____ Date _____ Time _____

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

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CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab	SMO Use	AR/COC	615197
Batch No. <i>MA</i>	Project Name: CWL-SVM	Date Samples Shipped: <i>1/17/14</i>	SMO Authorization: <i>[Signature]</i>
	Project/Task Manager: Tim Jackson	Carrier/Waybill No. <i>2/3724</i>	SMO Contact Phone: <i>SMO</i>
	Project/Task Number: 146422.10.11.03	Lab Contact: <i>BMT RILBY</i>	Wendy Palencia/505-844-3132
	Service Order: CF327-14	Lab Destination: TA/West Sacramento	Send Report to SMO: <input type="checkbox"/> 4° Celsius
		Contract No.: PO 691437	Wendy Palencia/505-844-3132

Tech Area:	Building:	Room:	Operational Site:
			Bill to: Sandia National Laboratories (Accounts Payable), P.O. Box 5800, MS-0154 Albuquerque, NM 87185-0154

Page 1 of 1

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
095145	-001	CWL-D2-120 (# 34001397)		1/16/14 10:53	SG	SC	6 L	None	G	SA	VOC-TO15	
095146	-001	CWL-D2-240 (# 34001201)		1/16/14 10:58	SG	SC	6 L	None	G	SA	VOC-TO15	
095147	-001	CWL-D2-350 (# 34001202)		1/16/14 11:04	SG	SC	6 L	None	G	SA	VOC-TO15	
095148	-001	CWL-D2-440 (# 34000108)		1/16/14 11:10	SG	SC	6 L	None	G	SA	VOC-TO15	
095149	-001	CWL-D2-470 (# 34000698)		1/16/14 11:15	SG	SC	6 L	None	G	SA	VOC-TO15	
095150	-001	CWL-D2-FB1 (# 34000038)		1/16/14 10:47	UPN	SC	6 L	None	G	FB	VOC-TO15	

Last Chain: <input type="checkbox"/> Yes	Sample Tracking	SMO Use	Special Instructions/QC Requirements:	Conditions on Receipt	
Validation Req'd: <input checked="" type="checkbox"/> Yes	Date Entered:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Background: <input type="checkbox"/> Yes	Entered by:		Turnaround Time <input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day		
Confirmatory: <input type="checkbox"/> Yes	QC inits.:		Negotiated TAT <input type="checkbox"/>		
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell	Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab
	William Gibson	<i>[Signature]</i>	<i>WJG</i>	SNL/4142/505-284-3307/505-239-7367	Return Samples By: Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547
	Robert Lynch	<i>[Signature]</i>	<i>RL</i>	SNL/4142/505-844-4013/505-250-7090	
	Alfred Santillanes	<i>[Signature]</i>	<i>AS</i>	SNL/4142/505-844-5130/505-228-0710	
	Tim Jackson	<i>[Signature]</i>	<i>TJ</i>	SNL/4142/505-284-2547/505-263-6639	
Gilbert Quintana	<i>[Signature]</i>	<i>GQ</i>	SNL/4143/505-284-2507/505-263-2606		

1. Relinquished by <i>[Signature]</i> Org. 4142 Date 1-17-14 Time 0834	3. Relinquished by	Org.	Date	Time
2. Received by <i>[Signature]</i> Org. 4142 Date 1-17-14 Time 0834	3. Received by	Org.	Date	Time
3. Relinquished by <i>[Signature]</i> Org. 4142 Date 1-17-14 Time 0945	4. Relinquished by	Org.	Date	Time
4. Received by <i>[Signature]</i> Org. Date 1-22-14 Time 915	4. Received by	Org.	Date	Time

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

CONTRACT LABORATORY ANALYSIS REQUEST AND CHAIN OF CUSTODY

Internal Lab

Batch No. N/A

SMO Use

AR/COC **615198**

Project Name: <u>CWL-SVM</u>	Date Samples Shipped: <u>1/17/14</u>	SMO Authorization: <u>[Signature]</u>	<input type="checkbox"/> Waste Characterization
Project/Task Manager: <u>Tim Jackson</u>	Carrier/Waybill No.: <u>213724</u>	SMO Contact Phone: <u>Wendy Palencia/505-844-3132</u>	<input type="checkbox"/> RMMA
Project/Task Number: <u>146422.10.11.03</u>	Lab Contact: <u>BOOTH RILEY</u>	Send Report to SMO: <u>Wendy Palencia/505-844-3132</u>	<input type="checkbox"/> Released by COC No. <input type="checkbox"/> 4° Celsius
Service Order: <u>CF327-14</u>	Lab Destination: <u>TA/West Sacramento</u>		
	Contract No.: <u>PO 691437</u>		

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

Sample No.	Fraction	Sample Location Detail	Depth (ft)	Date/Time Collected	Sample Matrix	Container		Preservative	Collection Method	Sample Type	Parameter & Method Requested	Lab Sample ID
						Type	Volume					
095151	-001	CWL-D3-120 (# 34001584)		1/16/14 11:37	SG	SC	6 L	None	G	SA	VOC-TO15	
095152	-001	CWL-D3-170 (# 34000119)		1/16/14 11:41	SG	SC	6 L	None	G	SA	VOC-TO15	
095153	-001	CWL-D3-350 (# 34000789)		1/16/14 11:46	SG	SC	6 L	None	G	SA	VOC-TO15	
095154	-001	CWL-D3-440 (# 34000823)		1/16/14 12:00	SG	SC	6 L	None	G	SA	VOC-TO15	
095155	-001	CWL-D3-480 (# 34001559)		1/16/14 11:51	SG	SC	6 L	None	G	SA	VOC-TO15	
095156	-001	CWL-D3-FB1 (# 34000853)		1/16/14 11:32	UPN	SC	6 L	None	G	FB	VOC-TO15	

Last Chain: <input type="checkbox"/> Yes		Sample Tracking		SMO Use		Special Instructions/QC Requirements:			Conditions on Receipt
Validation Req'd: <input checked="" type="checkbox"/> Yes		Date Entered:		Entered by:		EDD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Background: <input type="checkbox"/> Yes		QC inits.:		Turnaround Time		<input type="checkbox"/> 7 Day* <input type="checkbox"/> 15 Day* <input checked="" type="checkbox"/> 30 Day			
Confirmatory: <input type="checkbox"/> Yes				Negotiated TAT		<input type="checkbox"/>			
Sample Team Members	Name	Signature	Init.	Company/Organization/Phone/Cell		Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab			
	William Gibson	<u>[Signature]</u>	<u>WJG</u>	SNL/4142/505-284-3307/505-239-7367		Return Samples By:			
	Robert Lynch	<u>[Signature]</u>	<u>RL</u>	SNL/4142/505-844-4013/505-250-7090		Comments: Send Report to Tim Jackson/4142/MS 0729/505-284-2547			
	Alfred Santillanes	<u>[Signature]</u>	<u>AS</u>	SNL/4142/505-844-5130/505-228-0710					
	Tim Jackson	<u>[Signature]</u>	<u>TJ</u>	SNL/4142/505-284-2547/505-263-6639					
Gilbert Quintana	<u>[Signature]</u>	<u>GQ</u>	SNL/4143/505-284-2507/505-263-2606		Lab Use				

1. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>1-17-14</u> Time <u>0834</u>	3. Relinquished by _____ Org. _____ Date _____ Time _____
2. Received by <u>[Signature]</u> Org. <u>4142</u> Date <u>1-17-14</u> Time <u>0834</u>	4. Received by _____ Org. _____ Date _____ Time _____
2. Relinquished by <u>[Signature]</u> Org. <u>4142</u> Date <u>1-17-14</u> Time <u>0945</u>	4. Relinquished by _____ Org. _____ Date _____ Time _____
3. Received by <u>[Signature]</u> Org. _____ Date <u>1-22-14</u> Time <u>915</u>	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
615194	Environmental*
615195	Environmental*
615196	Environmental*
615197	Environmental*
615198	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
 ARCO No. 615194, 615195, 615196, 615197 & 615198 Analytical Lab TA-WEST SACRAMENTO SDG No. 320-5780-1

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?		If no, explain
		Yes	No	
1.1	All items on ARCO 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?		If no, explain
		Yes	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	Holding 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 sample accuracy reported and met for all samples		X	ACETONE FAILED RECOVERY LIMITS FOR LCS/LCD 320-35856/5 & 320-35856/6
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	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	SEVERAL ANALYTES DETECTED AT LOW LEVELS IN FIELD BLANKS
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; "N" - result associated with spike analysis outside control limits	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	N/A		

Contract Verification Review (Continued)

4.0 Calibration and Validation Documentation

Item	Yes	No	Comments
4.1 GC/MS (8260 and 8270)			
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		

Contract Verification Review (Continued)

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 (Concluded)

5.0 Data Anomaly Report

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

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? 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: W. Palencia Date: 2.28.2014

Were resolutions adequate and data package complete? Yes No

Closed by: _____ Date: _____

**SOIL-GAS SAMPLING RESULTS
CERTIFICATES OF ANALYSIS**

Chemical Waste Landfill

January 2014 – Soil-Gas Samples

Note: Certificates of Analysis are provided on compact disc only,
for printed copies of this report.

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095129-001/CWL-UI1-40

Lab Sample ID: 320-5780-1

Date Collected: 01/16/14 09:53

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	26	ppb v/v			02/08/14 01:42	328
Benzyl chloride	ND		260	53	ppb v/v			02/08/14 01:42	328
Bromodichloromethane	ND		98	22	ppb v/v			02/08/14 01:42	328
Bromoform	ND		130	23	ppb v/v			02/08/14 01:42	328
Bromomethane	ND		260	110	ppb v/v			02/08/14 01:42	328
2-Butanone (MEK)	ND		260	65	ppb v/v			02/08/14 01:42	328
Carbon disulfide	ND		260	26	ppb v/v			02/08/14 01:42	328
Carbon tetrachloride	ND		260	21	ppb v/v			02/08/14 01:42	328
Chlorobenzene	ND		98	21	ppb v/v			02/08/14 01:42	328
Chloroethane	ND		260	100	ppb v/v			02/08/14 01:42	328
Chloroform	750		98	31	ppb v/v			02/08/14 01:42	328
Chloromethane	ND		260	65	ppb v/v			02/08/14 01:42	328
Dibromochloromethane	ND		130	26	ppb v/v			02/08/14 01:42	328
1,2-Dibromoethane (EDB)	ND		260	25	ppb v/v			02/08/14 01:42	328
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	51	ppb v/v			02/08/14 01:42	328
1,2-Dichlorobenzene	ND		130	43	ppb v/v			02/08/14 01:42	328
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/08/14 01:42	328
1,4-Dichlorobenzene	ND		130	49	ppb v/v			02/08/14 01:42	328
Dichlorodifluoromethane	ND		130	48	ppb v/v			02/08/14 01:42	328
1,1-Dichloroethane	ND		98	24	ppb v/v			02/08/14 01:42	328
1,2-Dichloroethane	ND		260	29	ppb v/v			02/08/14 01:42	328
1,1-Dichloroethene	180	J	260	42	ppb v/v			02/08/14 01:42	328
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/08/14 01:42	328
trans-1,2-Dichloroethene	ND		130	33	ppb v/v			02/08/14 01:42	328
1,2-Dichloropropane	ND		130	79	ppb v/v			02/08/14 01:42	328
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/08/14 01:42	328
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/08/14 01:42	328
Ethylbenzene	61	J	130	21	ppb v/v			02/08/14 01:42	328
4-Ethyltoluene	ND		130	61	ppb v/v			02/08/14 01:42	328
Hexachlorobutadiene	ND		660	140	ppb v/v			02/08/14 01:42	328
2-Hexanone	ND		130	29	ppb v/v			02/08/14 01:42	328
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/08/14 01:42	328
Methylene Chloride	47	J	130	24	ppb v/v			02/08/14 01:42	328
Styrene	ND		130	19	ppb v/v			02/08/14 01:42	328
1,1,2,2-Tetrachloroethane	ND		130	23	ppb v/v			02/08/14 01:42	328
Tetrachloroethene	2800		130	17	ppb v/v			02/08/14 01:42	328
Toluene	310		130	17	ppb v/v			02/08/14 01:42	328
1,1,2-Trichloro-1,2,2-trifluoroethane	730		130	53	ppb v/v			02/08/14 01:42	328
1,2,4-Trichlorobenzene	ND		660	140	ppb v/v			02/08/14 01:42	328
1,1,1-Trichloroethane	56	J	98	21	ppb v/v			02/08/14 01:42	328
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 01:42	328
Trichloroethene	4800		130	34	ppb v/v			02/08/14 01:42	328
Trichlorofluoromethane	180		130	64	ppb v/v			02/08/14 01:42	328
1,2,4-Trimethylbenzene	ND		260	53	ppb v/v			02/08/14 01:42	328
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/08/14 01:42	328
Vinyl acetate	ND		260	48	ppb v/v			02/08/14 01:42	328
Vinyl chloride	ND		130	39	ppb v/v			02/08/14 01:42	328

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095129-001/CWL-UI1-40

Lab Sample ID: 320-5780-1

Date Collected: 01/16/14 09:53

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	260		260	33	ppb v/v			02/08/14 01:42	328
o-Xylene	110	J	130	18	ppb v/v			02/08/14 01:42	328
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130					02/08/14 01:42	328
1,2-Dichloroethane-d4 (Surr)	99		70 - 130					02/08/14 01:42	328
Toluene-d8 (Surr)	106		70 - 130					02/08/14 01:42	328

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	970	J	1600	57	ppb v/v			02/12/14 21:55	322
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130					02/12/14 21:55	322
1,2-Dichloroethane-d4 (Surr)	100		70 - 130					02/12/14 21:55	322
Toluene-d8 (Surr)	106		70 - 130					02/12/14 21:55	322

Client Sample ID: 095130-001/CWL-UI1-80

Lab Sample ID: 320-5780-2

Date Collected: 01/16/14 09:57

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	26	ppb v/v			02/08/14 02:31	331
Benzyl chloride	ND		260	54	ppb v/v			02/08/14 02:31	331
Bromodichloromethane	ND		99	22	ppb v/v			02/08/14 02:31	331
Bromoform	ND		130	23	ppb v/v			02/08/14 02:31	331
Bromomethane	ND		260	110	ppb v/v			02/08/14 02:31	331
2-Butanone (MEK)	ND		260	66	ppb v/v			02/08/14 02:31	331
Carbon disulfide	ND		260	26	ppb v/v			02/08/14 02:31	331
Carbon tetrachloride	ND		260	21	ppb v/v			02/08/14 02:31	331
Chlorobenzene	ND		99	21	ppb v/v			02/08/14 02:31	331
Chloroethane	ND		260	100	ppb v/v			02/08/14 02:31	331
Chloroform	580		99	31	ppb v/v			02/08/14 02:31	331
Chloromethane	ND		260	65	ppb v/v			02/08/14 02:31	331
Dibromochloromethane	ND		130	26	ppb v/v			02/08/14 02:31	331
1,2-Dibromoethane (EDB)	ND		260	25	ppb v/v			02/08/14 02:31	331
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	51	ppb v/v			02/08/14 02:31	331
1,2-Dichlorobenzene	ND		130	43	ppb v/v			02/08/14 02:31	331
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/08/14 02:31	331
1,4-Dichlorobenzene	ND		130	49	ppb v/v			02/08/14 02:31	331
Dichlorodifluoromethane	ND		130	48	ppb v/v			02/08/14 02:31	331
1,1-Dichloroethane	ND		99	24	ppb v/v			02/08/14 02:31	331
1,2-Dichloroethane	39	J	260	29	ppb v/v			02/08/14 02:31	331
1,1-Dichloroethene	320		260	43	ppb v/v			02/08/14 02:31	331
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/08/14 02:31	331
trans-1,2-Dichloroethene	ND		130	33	ppb v/v			02/08/14 02:31	331
1,2-Dichloropropane	ND		130	79	ppb v/v			02/08/14 02:31	331

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095130-001/CWL-UI1-80

Lab Sample ID: 320-5780-2

Date Collected: 01/16/14 09:57

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/08/14 02:31	331
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/08/14 02:31	331
Ethylbenzene	54	J	130	21	ppb v/v			02/08/14 02:31	331
4-Ethyltoluene	ND		130	62	ppb v/v			02/08/14 02:31	331
Hexachlorobutadiene	ND		660	140	ppb v/v			02/08/14 02:31	331
2-Hexanone	ND		130	29	ppb v/v			02/08/14 02:31	331
4-Methyl-2-pentanone (MIBK)	ND		130	45	ppb v/v			02/08/14 02:31	331
Methylene Chloride	110	J	130	24	ppb v/v			02/08/14 02:31	331
Styrene	ND		130	20	ppb v/v			02/08/14 02:31	331
1,1,1,2-Tetrachloroethane	ND		130	23	ppb v/v			02/08/14 02:31	331
Tetrachloroethene	950		130	17	ppb v/v			02/08/14 02:31	331
Toluene	280		130	17	ppb v/v			02/08/14 02:31	331
1,1,2-Trichloro-1,2,2-trifluoroethane	870		130	54	ppb v/v			02/08/14 02:31	331
1,2,4-Trichlorobenzene	ND		660	140	ppb v/v			02/08/14 02:31	331
1,1,1-Trichloroethane	52	J	99	22	ppb v/v			02/08/14 02:31	331
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 02:31	331
Trichloroethene	6300		130	35	ppb v/v			02/08/14 02:31	331
Trichlorofluoromethane	210		130	65	ppb v/v			02/08/14 02:31	331
1,2,4-Trimethylbenzene	ND		260	54	ppb v/v			02/08/14 02:31	331
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/08/14 02:31	331
Vinyl acetate	ND		260	48	ppb v/v			02/08/14 02:31	331
Vinyl chloride	ND		130	40	ppb v/v			02/08/14 02:31	331
m,p-Xylene	240	J	260	33	ppb v/v			02/08/14 02:31	331
o-Xylene	83	J	130	18	ppb v/v			02/08/14 02:31	331

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130		02/08/14 02:31	331
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		02/08/14 02:31	331
Toluene-d8 (Surr)	105		70 - 130		02/08/14 02:31	331

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	980	J	1700	59	ppb v/v			02/12/14 22:44	331

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130		02/12/14 22:44	331
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		02/12/14 22:44	331
Toluene-d8 (Surr)	107		70 - 130		02/12/14 22:44	331

Client Sample ID: 095131-001/CWL-UI1-120

Lab Sample ID: 320-5780-3

Date Collected: 01/16/14 10:02

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	26	ppb v/v			02/08/14 03:19	334
Benzyl chloride	ND		270	54	ppb v/v			02/08/14 03:19	334
Bromodichloromethane	ND		100	22	ppb v/v			02/08/14 03:19	334

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095131-001/CWL-UI1-120

Lab Sample ID: 320-5780-3

Date Collected: 01/16/14 10:02

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromoform	ND		130	23	ppb v/v			02/08/14 03:19	334
Bromomethane	ND		270	110	ppb v/v			02/08/14 03:19	334
2-Butanone (MEK)	ND		270	66	ppb v/v			02/08/14 03:19	334
Carbon disulfide	ND		270	26	ppb v/v			02/08/14 03:19	334
Carbon tetrachloride	ND		270	21	ppb v/v			02/08/14 03:19	334
Chlorobenzene	ND		100	21	ppb v/v			02/08/14 03:19	334
Chloroethane	ND		270	100	ppb v/v			02/08/14 03:19	334
Chloroform	450		100	32	ppb v/v			02/08/14 03:19	334
Chloromethane	ND		270	66	ppb v/v			02/08/14 03:19	334
Dibromochloromethane	ND		130	26	ppb v/v			02/08/14 03:19	334
1,2-Dibromoethane (EDB)	ND		270	25	ppb v/v			02/08/14 03:19	334
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	52	ppb v/v			02/08/14 03:19	334
1,2-Dichlorobenzene	ND		130	43	ppb v/v			02/08/14 03:19	334
1,3-Dichlorobenzene	ND		130	37	ppb v/v			02/08/14 03:19	334
1,4-Dichlorobenzene	ND		130	50	ppb v/v			02/08/14 03:19	334
Dichlorodifluoromethane	ND		130	48	ppb v/v			02/08/14 03:19	334
1,1-Dichloroethane	ND		100	24	ppb v/v			02/08/14 03:19	334
1,2-Dichloroethane	69 J		270	29	ppb v/v			02/08/14 03:19	334
1,1-Dichloroethene	420		270	43	ppb v/v			02/08/14 03:19	334
cis-1,2-Dichloroethene	ND		130	30	ppb v/v			02/08/14 03:19	334
trans-1,2-Dichloroethene	ND		130	33	ppb v/v			02/08/14 03:19	334
1,2-Dichloropropane	ND		130	80	ppb v/v			02/08/14 03:19	334
cis-1,3-Dichloropropene	ND		130	35	ppb v/v			02/08/14 03:19	334
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/08/14 03:19	334
Ethylbenzene	60 J		130	21	ppb v/v			02/08/14 03:19	334
4-Ethyltoluene	ND		130	62	ppb v/v			02/08/14 03:19	334
Hexachlorobutadiene	ND		670	140	ppb v/v			02/08/14 03:19	334
2-Hexanone	ND		130	29	ppb v/v			02/08/14 03:19	334
4-Methyl-2-pentanone (MIBK)	ND		130	45	ppb v/v			02/08/14 03:19	334
Methylene Chloride	240		130	24	ppb v/v			02/08/14 03:19	334
Styrene	27 J		130	20	ppb v/v			02/08/14 03:19	334
1,1,1,2-Tetrachloroethane	ND		130	23	ppb v/v			02/08/14 03:19	334
Tetrachloroethene	670		130	17	ppb v/v			02/08/14 03:19	334
Toluene	320		130	17	ppb v/v			02/08/14 03:19	334
1,1,2-Trichloro-1,2,2-trifluoroethane	1000		130	54	ppb v/v			02/08/14 03:19	334
1,2,4-Trichlorobenzene	ND		670	140	ppb v/v			02/08/14 03:19	334
1,1,1-Trichloroethane	55 J		100	22	ppb v/v			02/08/14 03:19	334
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 03:19	334
Trichloroethene	7600		130	35	ppb v/v			02/08/14 03:19	334
Trichlorofluoromethane	240		130	65	ppb v/v			02/08/14 03:19	334
1,2,4-Trimethylbenzene	ND		270	54	ppb v/v			02/08/14 03:19	334
1,3,5-Trimethylbenzene	ND		130	42	ppb v/v			02/08/14 03:19	334
Vinyl acetate	ND		270	48	ppb v/v			02/08/14 03:19	334
Vinyl chloride	ND		130	40	ppb v/v			02/08/14 03:19	334
m,p-Xylene	260 J		270	33	ppb v/v			02/08/14 03:19	334
o-Xylene	84 J		130	18	ppb v/v			02/08/14 03:19	334

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095131-001/CWL-UI1-120

Lab Sample ID: 320-5780-3

Date Collected: 01/16/14 10:02

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130		02/08/14 03:19	334
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/08/14 03:19	334
Toluene-d8 (Surr)	104		70 - 130		02/08/14 03:19	334

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	900	J	1700	59	ppb v/v			02/12/14 23:33	334

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130		02/12/14 23:33	334
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/12/14 23:33	334
Toluene-d8 (Surr)	106		70 - 130		02/12/14 23:33	334

Client Sample ID: 095132-001/CWL-UI1-120

Lab Sample ID: 320-5780-4

Date Collected: 01/16/14 10:04

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.3	J	130	4.6	ppb v/v			02/10/14 00:15	25.6
Benzene	6.0	J	10	2.0	ppb v/v			02/10/14 00:15	25.6
Benzyl chloride	ND		20	4.2	ppb v/v			02/10/14 00:15	25.6
Bromodichloromethane	ND		7.7	1.7	ppb v/v			02/10/14 00:15	25.6
Bromoform	ND		10	1.8	ppb v/v			02/10/14 00:15	25.6
Bromomethane	ND		20	8.6	ppb v/v			02/10/14 00:15	25.6
2-Butanone (MEK)	ND		20	5.1	ppb v/v			02/10/14 00:15	25.6
Carbon disulfide	ND		20	2.0	ppb v/v			02/10/14 00:15	25.6
Carbon tetrachloride	25		20	1.6	ppb v/v			02/10/14 00:15	25.6
Chlorobenzene	ND		7.7	1.6	ppb v/v			02/10/14 00:15	25.6
Chloroethane	ND		20	7.9	ppb v/v			02/10/14 00:15	25.6
Chloroform	490		7.7	2.4	ppb v/v			02/10/14 00:15	25.6
Chloromethane	ND		20	5.0	ppb v/v			02/10/14 00:15	25.6
Dibromochloromethane	ND		10	2.0	ppb v/v			02/10/14 00:15	25.6
1,2-Dibromoethane (EDB)	7.9	J	20	1.9	ppb v/v			02/10/14 00:15	25.6
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		10	4.0	ppb v/v			02/10/14 00:15	25.6
1,2-Dichlorobenzene	12		10	3.3	ppb v/v			02/10/14 00:15	25.6
1,3-Dichlorobenzene	ND		10	2.8	ppb v/v			02/10/14 00:15	25.6
1,4-Dichlorobenzene	ND		10	3.8	ppb v/v			02/10/14 00:15	25.6
Dichlorodifluoromethane	46		10	3.7	ppb v/v			02/10/14 00:15	25.6
1,1-Dichloroethane	18		7.7	1.8	ppb v/v			02/10/14 00:15	25.6
1,2-Dichloroethane	38		20	2.3	ppb v/v			02/10/14 00:15	25.6
1,1-Dichloroethene	490		20	3.3	ppb v/v			02/10/14 00:15	25.6
cis-1,2-Dichloroethene	ND		10	2.3	ppb v/v			02/10/14 00:15	25.6
trans-1,2-Dichloroethene	ND		10	2.6	ppb v/v			02/10/14 00:15	25.6
1,2-Dichloropropane	84		10	6.1	ppb v/v			02/10/14 00:15	25.6
cis-1,3-Dichloropropene	ND		10	2.7	ppb v/v			02/10/14 00:15	25.6
trans-1,3-Dichloropropene	ND		10	2.3	ppb v/v			02/10/14 00:15	25.6
Ethylbenzene	ND		10	1.6	ppb v/v			02/10/14 00:15	25.6
4-Ethyltoluene	ND		10	4.8	ppb v/v			02/10/14 00:15	25.6

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095132-001/CWL-UI1-120

Lab Sample ID: 320-5780-4

Date Collected: 01/16/14 10:04

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorobutadiene	ND		51	11	ppb v/v			02/10/14 00:15	25.6
2-Hexanone	ND		10	2.2	ppb v/v			02/10/14 00:15	25.6
4-Methyl-2-pentanone (MIBK)	ND		10	3.5	ppb v/v			02/10/14 00:15	25.6
Methylene Chloride	230		10	1.8	ppb v/v			02/10/14 00:15	25.6
Styrene	ND		10	1.5	ppb v/v			02/10/14 00:15	25.6
1,1,2,2-Tetrachloroethane	ND		10	1.8	ppb v/v			02/10/14 00:15	25.6
Tetrachloroethene	790		10	1.3	ppb v/v			02/10/14 00:15	25.6
Toluene	8.0	J	10	1.3	ppb v/v			02/10/14 00:15	25.6
1,1,2-Trichloro-1,2,2-trifluoroethane	1000		10	4.2	ppb v/v			02/10/14 00:15	25.6
1,2,4-Trichlorobenzene	ND		51	11	ppb v/v			02/10/14 00:15	25.6
1,1,1-Trichloroethane	57		7.7	1.7	ppb v/v			02/10/14 00:15	25.6
1,1,2-Trichloroethane	7.0	J	10	1.7	ppb v/v			02/10/14 00:15	25.6
Trichlorofluoromethane	300		10	5.0	ppb v/v			02/10/14 00:15	25.6
1,2,4-Trimethylbenzene	ND		20	4.1	ppb v/v			02/10/14 00:15	25.6
1,3,5-Trimethylbenzene	ND		10	3.2	ppb v/v			02/10/14 00:15	25.6
Vinyl acetate	ND		20	3.7	ppb v/v			02/10/14 00:15	25.6
Vinyl chloride	ND		10	3.1	ppb v/v			02/10/14 00:15	25.6
m,p-Xylene	ND		20	2.6	ppb v/v			02/10/14 00:15	25.6
o-Xylene	4.2	J	10	1.4	ppb v/v			02/10/14 00:15	25.6

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		70 - 130		02/10/14 00:15	25.6
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/10/14 00:15	25.6
Toluene-d8 (Surr)	108		70 - 130		02/10/14 00:15	25.6

Method: TO-15 - Volatile Organic Compounds in Ambient Air - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Trichloroethene	7600		130	34	ppb v/v			02/13/14 00:21	320

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/13/14 00:21	320
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/13/14 00:21	320
Toluene-d8 (Surr)	107		70 - 130		02/13/14 00:21	320

Client Sample ID: 095133-001/CWL-UI1-FB1

Lab Sample ID: 320-5780-5

Date Collected: 01/16/14 10:06

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40	0.079	ppb v/v			02/08/14 05:00	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/08/14 05:00	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/08/14 05:00	1
Bromoform	ND		0.40	0.070	ppb v/v			02/08/14 05:00	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/08/14 05:00	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			02/08/14 05:00	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/08/14 05:00	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/08/14 05:00	1

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095133-001/CWL-UI1-FB1

Lab Sample ID: 320-5780-5

Date Collected: 01/16/14 10:06

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/08/14 05:00	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/08/14 05:00	1
Chloroform	ND		0.30	0.095	ppb v/v			02/08/14 05:00	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/08/14 05:00	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/08/14 05:00	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/08/14 05:00	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/08/14 05:00	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/08/14 05:00	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/08/14 05:00	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/08/14 05:00	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			02/08/14 05:00	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/08/14 05:00	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/08/14 05:00	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/08/14 05:00	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/08/14 05:00	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/08/14 05:00	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/08/14 05:00	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/08/14 05:00	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/08/14 05:00	1
Ethylbenzene	0.082	J	0.40	0.063	ppb v/v			02/08/14 05:00	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/08/14 05:00	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/08/14 05:00	1
2-Hexanone	ND		0.40	0.087	ppb v/v			02/08/14 05:00	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			02/08/14 05:00	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			02/08/14 05:00	1
Styrene	ND		0.40	0.059	ppb v/v			02/08/14 05:00	1
1,1,1,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/08/14 05:00	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/08/14 05:00	1
Toluene	0.45		0.40	0.051	ppb v/v			02/08/14 05:00	1
1,1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/08/14 05:00	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/08/14 05:00	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/08/14 05:00	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/08/14 05:00	1
Trichloroethene	ND		0.40	0.11	ppb v/v			02/08/14 05:00	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/08/14 05:00	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/08/14 05:00	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/08/14 05:00	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/08/14 05:00	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/08/14 05:00	1
m,p-Xylene	0.19	J	0.80	0.10	ppb v/v			02/08/14 05:00	1
o-Xylene	0.068	J	0.40	0.054	ppb v/v			02/08/14 05:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		70 - 130					02/08/14 05:00	1
1,2-Dichloroethane-d4 (Surr)	97		70 - 130					02/08/14 05:00	1
Toluene-d8 (Surr)	102		70 - 130					02/08/14 05:00	1

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095133-001/CWL-UI1-FB1

Lab Sample ID: 320-5780-5

Date Collected: 01/16/14 10:06

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	J	5.0	0.18	ppb v/v			02/13/14 01:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		70 - 130					02/13/14 01:13	1
1,2-Dichloroethane-d4 (Surr)	100		70 - 130					02/13/14 01:13	1
Toluene-d8 (Surr)	105		70 - 130					02/13/14 01:13	1

Client Sample ID: 095134-001/CWL-UI2-36

Lab Sample ID: 320-5780-6

Date Collected: 01/16/14 10:22

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	26	ppb v/v			02/08/14 05:48	325
Benzyl chloride	ND		260	53	ppb v/v			02/08/14 05:48	325
Bromodichloromethane	ND		98	21	ppb v/v			02/08/14 05:48	325
Bromoform	ND		130	23	ppb v/v			02/08/14 05:48	325
Bromomethane	ND		260	110	ppb v/v			02/08/14 05:48	325
2-Butanone (MEK)	ND		260	65	ppb v/v			02/08/14 05:48	325
Carbon disulfide	ND		260	25	ppb v/v			02/08/14 05:48	325
Carbon tetrachloride	ND		260	21	ppb v/v			02/08/14 05:48	325
Chlorobenzene	ND		98	21	ppb v/v			02/08/14 05:48	325
Chloroethane	ND		260	100	ppb v/v			02/08/14 05:48	325
Chloroform	510		98	31	ppb v/v			02/08/14 05:48	325
Chloromethane	ND		260	64	ppb v/v			02/08/14 05:48	325
Dibromochloromethane	ND		130	26	ppb v/v			02/08/14 05:48	325
1,2-Dibromoethane (EDB)	ND		260	24	ppb v/v			02/08/14 05:48	325
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	50	ppb v/v			02/08/14 05:48	325
1,2-Dichlorobenzene	ND		130	42	ppb v/v			02/08/14 05:48	325
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/08/14 05:48	325
1,4-Dichlorobenzene	ND		130	48	ppb v/v			02/08/14 05:48	325
Dichlorodifluoromethane	ND		130	47	ppb v/v			02/08/14 05:48	325
1,1-Dichloroethane	ND		98	23	ppb v/v			02/08/14 05:48	325
1,2-Dichloroethane	ND		260	29	ppb v/v			02/08/14 05:48	325
1,1-Dichloroethene	ND		260	42	ppb v/v			02/08/14 05:48	325
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/08/14 05:48	325
trans-1,2-Dichloroethene	ND		130	33	ppb v/v			02/08/14 05:48	325
1,2-Dichloropropane	ND		130	78	ppb v/v			02/08/14 05:48	325
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/08/14 05:48	325
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/08/14 05:48	325
Ethylbenzene	55	J	130	20	ppb v/v			02/08/14 05:48	325
4-Ethyltoluene	ND		130	61	ppb v/v			02/08/14 05:48	325
Hexachlorobutadiene	ND		650	140	ppb v/v			02/08/14 05:48	325
2-Hexanone	ND		130	28	ppb v/v			02/08/14 05:48	325
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/08/14 05:48	325
Methylene Chloride	50	J	130	23	ppb v/v			02/08/14 05:48	325
Styrene	ND		130	19	ppb v/v			02/08/14 05:48	325
1,1,2,2-Tetrachloroethane	ND		130	22	ppb v/v			02/08/14 05:48	325

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095134-001/CWL-UI2-36

Lab Sample ID: 320-5780-6

Date Collected: 01/16/14 10:22

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	130		130	17	ppb v/v			02/08/14 05:48	325
Toluene	280		130	17	ppb v/v			02/08/14 05:48	325
1,1,2-Trichloro-1,2,2-trifluoroethane	480		130	53	ppb v/v			02/08/14 05:48	325
1,2,4-Trichlorobenzene	ND		650	140	ppb v/v			02/08/14 05:48	325
1,1,1-Trichloroethane	33	J	98	21	ppb v/v			02/08/14 05:48	325
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 05:48	325
Trichloroethene	2800		130	34	ppb v/v			02/08/14 05:48	325
Trichlorofluoromethane	130		130	64	ppb v/v			02/08/14 05:48	325
1,2,4-Trimethylbenzene	ND		260	53	ppb v/v			02/08/14 05:48	325
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/08/14 05:48	325
Vinyl acetate	ND		260	47	ppb v/v			02/08/14 05:48	325
Vinyl chloride	ND		130	39	ppb v/v			02/08/14 05:48	325
m,p-Xylene	250	J	260	33	ppb v/v			02/08/14 05:48	325
o-Xylene	87	J	130	18	ppb v/v			02/08/14 05:48	325
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130					02/08/14 05:48	325
1,2-Dichloroethane-d4 (Surr)	101		70 - 130					02/08/14 05:48	325
Toluene-d8 (Surr)	104		70 - 130					02/08/14 05:48	325

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	280	J	430	15	ppb v/v			02/10/14 01:04	86.7
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130					02/10/14 01:04	86.7
1,2-Dichloroethane-d4 (Surr)	100		70 - 130					02/10/14 01:04	86.7
Toluene-d8 (Surr)	105		70 - 130					02/10/14 01:04	86.7

Client Sample ID: 095135-001/CWL-UI2-76

Lab Sample ID: 320-5780-7

Date Collected: 01/16/14 10:27

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		120	24	ppb v/v			02/08/14 06:36	306
Benzyl chloride	ND		240	50	ppb v/v			02/08/14 06:36	306
Bromodichloromethane	ND		92	20	ppb v/v			02/08/14 06:36	306
Bromoform	ND		120	21	ppb v/v			02/08/14 06:36	306
Bromomethane	ND		240	100	ppb v/v			02/08/14 06:36	306
2-Butanone (MEK)	ND		240	61	ppb v/v			02/08/14 06:36	306
Carbon disulfide	ND		240	24	ppb v/v			02/08/14 06:36	306
Carbon tetrachloride	ND		240	20	ppb v/v			02/08/14 06:36	306
Chlorobenzene	ND		92	20	ppb v/v			02/08/14 06:36	306
Chloroethane	ND		240	94	ppb v/v			02/08/14 06:36	306
Chloroform	520		92	29	ppb v/v			02/08/14 06:36	306
Chloromethane	ND		240	60	ppb v/v			02/08/14 06:36	306
Dibromochloromethane	ND		120	24	ppb v/v			02/08/14 06:36	306

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095135-001/CWL-UI2-76

Lab Sample ID: 320-5780-7

Date Collected: 01/16/14 10:27

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		240	23	ppb v/v			02/08/14 06:36	306
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		120	47	ppb v/v			02/08/14 06:36	306
1,2-Dichlorobenzene	ND		120	40	ppb v/v			02/08/14 06:36	306
1,3-Dichlorobenzene	ND		120	34	ppb v/v			02/08/14 06:36	306
1,4-Dichlorobenzene	ND		120	46	ppb v/v			02/08/14 06:36	306
Dichlorodifluoromethane	ND		120	44	ppb v/v			02/08/14 06:36	306
1,1-Dichloroethane	ND		92	22	ppb v/v			02/08/14 06:36	306
1,2-Dichloroethane	33	J	240	27	ppb v/v			02/08/14 06:36	306
1,1-Dichloroethene	91	J	240	39	ppb v/v			02/08/14 06:36	306
cis-1,2-Dichloroethene	ND		120	27	ppb v/v			02/08/14 06:36	306
trans-1,2-Dichloroethene	ND		120	31	ppb v/v			02/08/14 06:36	306
1,2-Dichloropropane	ND		120	73	ppb v/v			02/08/14 06:36	306
cis-1,3-Dichloropropene	ND		120	32	ppb v/v			02/08/14 06:36	306
trans-1,3-Dichloropropene	ND		120	27	ppb v/v			02/08/14 06:36	306
Ethylbenzene	57	J	120	19	ppb v/v			02/08/14 06:36	306
4-Ethyltoluene	ND		120	57	ppb v/v			02/08/14 06:36	306
Hexachlorobutadiene	ND		610	130	ppb v/v			02/08/14 06:36	306
2-Hexanone	ND		120	27	ppb v/v			02/08/14 06:36	306
4-Methyl-2-pentanone (MIBK)	ND		120	41	ppb v/v			02/08/14 06:36	306
Methylene Chloride	42	J	120	22	ppb v/v			02/08/14 06:36	306
Styrene	23	J	120	18	ppb v/v			02/08/14 06:36	306
1,1,1,2-Tetrachloroethane	ND		120	21	ppb v/v			02/08/14 06:36	306
Tetrachloroethene	140		120	16	ppb v/v			02/08/14 06:36	306
Toluene	310		120	16	ppb v/v			02/08/14 06:36	306
1,1,2-Trichloro-1,2,2-trifluoroethane	610		120	50	ppb v/v			02/08/14 06:36	306
1,2,4-Trichlorobenzene	ND		610	130	ppb v/v			02/08/14 06:36	306
1,1,1-Trichloroethane	28	J	92	20	ppb v/v			02/08/14 06:36	306
1,1,2-Trichloroethane	ND		120	21	ppb v/v			02/08/14 06:36	306
Trichloroethene	3700		120	32	ppb v/v			02/08/14 06:36	306
Trichlorofluoromethane	150		120	60	ppb v/v			02/08/14 06:36	306
1,2,4-Trimethylbenzene	ND		240	50	ppb v/v			02/08/14 06:36	306
1,3,5-Trimethylbenzene	ND		120	38	ppb v/v			02/08/14 06:36	306
Vinyl acetate	ND		240	44	ppb v/v			02/08/14 06:36	306
Vinyl chloride	ND		120	37	ppb v/v			02/08/14 06:36	306
m,p-Xylene	250		240	31	ppb v/v			02/08/14 06:36	306
o-Xylene	82	J	120	17	ppb v/v			02/08/14 06:36	306

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/08/14 06:36	306
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/08/14 06:36	306
Toluene-d8 (Surr)	105		70 - 130		02/08/14 06:36	306

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	300	J	490	17	ppb v/v			02/10/14 01:54	98

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130		02/10/14 01:54	98

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095135-001/CWL-UI2-76

Lab Sample ID: 320-5780-7

Date Collected: 01/16/14 10:27

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/10/14 01:54	98
Toluene-d8 (Surr)	107		70 - 130		02/10/14 01:54	98

Client Sample ID: 095136-001/CWL-UI2-136

Lab Sample ID: 320-5780-8

Date Collected: 01/16/14 10:30

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	26	ppb v/v			02/08/14 07:24	325
Benzyl chloride	ND		260	53	ppb v/v			02/08/14 07:24	325
Bromodichloromethane	ND		98	21	ppb v/v			02/08/14 07:24	325
Bromoform	ND		130	23	ppb v/v			02/08/14 07:24	325
Bromomethane	ND		260	110	ppb v/v			02/08/14 07:24	325
2-Butanone (MEK)	ND		260	65	ppb v/v			02/08/14 07:24	325
Carbon disulfide	ND		260	25	ppb v/v			02/08/14 07:24	325
Carbon tetrachloride	25	J	260	21	ppb v/v			02/08/14 07:24	325
Chlorobenzene	ND		98	21	ppb v/v			02/08/14 07:24	325
Chloroethane	ND		260	100	ppb v/v			02/08/14 07:24	325
Chloroform	570		98	31	ppb v/v			02/08/14 07:24	325
Chloromethane	ND		260	64	ppb v/v			02/08/14 07:24	325
Dibromochloromethane	ND		130	26	ppb v/v			02/08/14 07:24	325
1,2-Dibromoethane (EDB)	ND		260	24	ppb v/v			02/08/14 07:24	325
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	50	ppb v/v			02/08/14 07:24	325
1,2-Dichlorobenzene	ND		130	42	ppb v/v			02/08/14 07:24	325
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/08/14 07:24	325
1,4-Dichlorobenzene	ND		130	48	ppb v/v			02/08/14 07:24	325
Dichlorodifluoromethane	ND		130	47	ppb v/v			02/08/14 07:24	325
1,1-Dichloroethane	ND		98	23	ppb v/v			02/08/14 07:24	325
1,2-Dichloroethane	44	J	260	29	ppb v/v			02/08/14 07:24	325
1,1-Dichloroethene	190	J	260	42	ppb v/v			02/08/14 07:24	325
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/08/14 07:24	325
trans-1,2-Dichloroethene	ND		130	33	ppb v/v			02/08/14 07:24	325
1,2-Dichloropropane	140		130	78	ppb v/v			02/08/14 07:24	325
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/08/14 07:24	325
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/08/14 07:24	325
Ethylbenzene	59	J	130	20	ppb v/v			02/08/14 07:24	325
4-Ethyltoluene	ND		130	61	ppb v/v			02/08/14 07:24	325
Hexachlorobutadiene	ND		650	140	ppb v/v			02/08/14 07:24	325
2-Hexanone	ND		130	28	ppb v/v			02/08/14 07:24	325
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/08/14 07:24	325
Methylene Chloride	55	J	130	23	ppb v/v			02/08/14 07:24	325
Styrene	ND		130	19	ppb v/v			02/08/14 07:24	325
1,1,2,2-Tetrachloroethane	ND		130	22	ppb v/v			02/08/14 07:24	325
Tetrachloroethene	190		130	17	ppb v/v			02/08/14 07:24	325
Toluene	310		130	17	ppb v/v			02/08/14 07:24	325

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095136-001/CWL-UI2-136

Lab Sample ID: 320-5780-8

Date Collected: 01/16/14 10:30

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	930		130	53	ppb v/v			02/08/14 07:24	325
1,2,4-Trichlorobenzene	ND		650	140	ppb v/v			02/08/14 07:24	325
1,1,1-Trichloroethane	35	J	98	21	ppb v/v			02/08/14 07:24	325
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 07:24	325
Trichloroethene	6200		130	34	ppb v/v			02/08/14 07:24	325
Trichlorofluoromethane	220		130	64	ppb v/v			02/08/14 07:24	325
1,2,4-Trimethylbenzene	ND		260	53	ppb v/v			02/08/14 07:24	325
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/08/14 07:24	325
Vinyl acetate	ND		260	47	ppb v/v			02/08/14 07:24	325
Vinyl chloride	ND		130	39	ppb v/v			02/08/14 07:24	325
m,p-Xylene	260		260	33	ppb v/v			02/08/14 07:24	325
o-Xylene	86	J	130	18	ppb v/v			02/08/14 07:24	325

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/08/14 07:24	325
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/08/14 07:24	325
Toluene-d8 (Surr)	107		70 - 130		02/08/14 07:24	325

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	960	J	1600	58	ppb v/v			02/13/14 02:02	325

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130		02/13/14 02:02	325
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/13/14 02:02	325
Toluene-d8 (Surr)	106		70 - 130		02/13/14 02:02	325

Client Sample ID: 095137-001/CWL-UI2-136

Lab Sample ID: 320-5780-9

Date Collected: 01/16/14 10:32

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	25	ppb v/v			02/08/14 08:13	322
Benzyl chloride	ND		260	52	ppb v/v			02/08/14 08:13	322
Bromodichloromethane	ND		97	21	ppb v/v			02/08/14 08:13	322
Bromoform	ND		130	23	ppb v/v			02/08/14 08:13	322
Bromomethane	ND		260	110	ppb v/v			02/08/14 08:13	322
2-Butanone (MEK)	ND		260	64	ppb v/v			02/08/14 08:13	322
Carbon disulfide	ND		260	25	ppb v/v			02/08/14 08:13	322
Carbon tetrachloride	22	J	260	21	ppb v/v			02/08/14 08:13	322
Chlorobenzene	ND		97	21	ppb v/v			02/08/14 08:13	322
Chloroethane	ND		260	99	ppb v/v			02/08/14 08:13	322
Chloroform	540		97	31	ppb v/v			02/08/14 08:13	322
Chloromethane	ND		260	63	ppb v/v			02/08/14 08:13	322
Dibromochloromethane	ND		130	25	ppb v/v			02/08/14 08:13	322
1,2-Dibromoethane (EDB)	ND		260	24	ppb v/v			02/08/14 08:13	322
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	50	ppb v/v			02/08/14 08:13	322

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095137-001/CWL-UI2-136

Lab Sample ID: 320-5780-9

Date Collected: 01/16/14 10:32

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		130	42	ppb v/v			02/08/14 08:13	322
1,3-Dichlorobenzene	ND		130	35	ppb v/v			02/08/14 08:13	322
1,4-Dichlorobenzene	ND		130	48	ppb v/v			02/08/14 08:13	322
Dichlorodifluoromethane	ND		130	47	ppb v/v			02/08/14 08:13	322
1,1-Dichloroethane	ND		97	23	ppb v/v			02/08/14 08:13	322
1,2-Dichloroethane	49	J	260	28	ppb v/v			02/08/14 08:13	322
1,1-Dichloroethene	190	J	260	42	ppb v/v			02/08/14 08:13	322
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/08/14 08:13	322
trans-1,2-Dichloroethene	ND		130	32	ppb v/v			02/08/14 08:13	322
1,2-Dichloropropane	140		130	77	ppb v/v			02/08/14 08:13	322
cis-1,3-Dichloropropene	ND		130	33	ppb v/v			02/08/14 08:13	322
trans-1,3-Dichloropropene	ND		130	28	ppb v/v			02/08/14 08:13	322
Ethylbenzene	69	J	130	20	ppb v/v			02/08/14 08:13	322
4-Ethyltoluene	ND		130	60	ppb v/v			02/08/14 08:13	322
Hexachlorobutadiene	ND		640	140	ppb v/v			02/08/14 08:13	322
2-Hexanone	ND		130	28	ppb v/v			02/08/14 08:13	322
4-Methyl-2-pentanone (MIBK)	ND		130	43	ppb v/v			02/08/14 08:13	322
Methylene Chloride	53	J	130	23	ppb v/v			02/08/14 08:13	322
Styrene	26	J	130	19	ppb v/v			02/08/14 08:13	322
1,1,1,2-Tetrachloroethane	ND		130	22	ppb v/v			02/08/14 08:13	322
Tetrachloroethene	170		130	16	ppb v/v			02/08/14 08:13	322
Toluene	350		130	16	ppb v/v			02/08/14 08:13	322
1,1,2-Trichloro-1,2,2-trifluoroethane	900		130	52	ppb v/v			02/08/14 08:13	322
1,2,4-Trichlorobenzene	ND		640	140	ppb v/v			02/08/14 08:13	322
1,1,1-Trichloroethane	33	J	97	21	ppb v/v			02/08/14 08:13	322
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 08:13	322
Trichloroethene	5900		130	34	ppb v/v			02/08/14 08:13	322
Trichlorofluoromethane	220		130	63	ppb v/v			02/08/14 08:13	322
1,2,4-Trimethylbenzene	ND		260	52	ppb v/v			02/08/14 08:13	322
1,3,5-Trimethylbenzene	ND		130	40	ppb v/v			02/08/14 08:13	322
Vinyl acetate	ND		260	47	ppb v/v			02/08/14 08:13	322
Vinyl chloride	ND		130	39	ppb v/v			02/08/14 08:13	322
m,p-Xylene	290		260	32	ppb v/v			02/08/14 08:13	322
o-Xylene	98	J	130	17	ppb v/v			02/08/14 08:13	322

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130		02/08/14 08:13	322
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/08/14 08:13	322
Toluene-d8 (Surr)	106		70 - 130		02/08/14 08:13	322

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	870	J	1600	57	ppb v/v			02/13/14 02:51	322

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/13/14 02:51	322
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/13/14 02:51	322
Toluene-d8 (Surr)	108		70 - 130		02/13/14 02:51	322

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095138-001/CWL-UI2-FB1

Lab Sample ID: 320-5780-10

Date Collected: 01/16/14 10:18

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40	0.079	ppb v/v			02/08/14 09:05	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/08/14 09:05	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/08/14 09:05	1
Bromoform	ND		0.40	0.070	ppb v/v			02/08/14 09:05	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/08/14 09:05	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			02/08/14 09:05	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/08/14 09:05	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/08/14 09:05	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/08/14 09:05	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/08/14 09:05	1
Chloroform	ND		0.30	0.095	ppb v/v			02/08/14 09:05	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/08/14 09:05	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/08/14 09:05	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/08/14 09:05	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/08/14 09:05	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/08/14 09:05	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/08/14 09:05	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/08/14 09:05	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			02/08/14 09:05	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/08/14 09:05	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/08/14 09:05	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/08/14 09:05	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/08/14 09:05	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/08/14 09:05	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/08/14 09:05	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/08/14 09:05	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/08/14 09:05	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/08/14 09:05	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/08/14 09:05	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/08/14 09:05	1
2-Hexanone	ND		0.40	0.087	ppb v/v			02/08/14 09:05	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			02/08/14 09:05	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			02/08/14 09:05	1
Styrene	ND		0.40	0.059	ppb v/v			02/08/14 09:05	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/08/14 09:05	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/08/14 09:05	1
Toluene	ND		0.40	0.051	ppb v/v			02/08/14 09:05	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/08/14 09:05	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/08/14 09:05	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/08/14 09:05	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/08/14 09:05	1
Trichloroethene	ND		0.40	0.11	ppb v/v			02/08/14 09:05	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/08/14 09:05	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/08/14 09:05	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/08/14 09:05	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/08/14 09:05	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/08/14 09:05	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			02/08/14 09:05	1

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095138-001/CWL-UI2-FB1

Lab Sample ID: 320-5780-10

Date Collected: 01/16/14 10:18

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		0.40	0.054	ppb v/v			02/08/14 09:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		70 - 130		02/08/14 09:05	1
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		02/08/14 09:05	1
Toluene-d8 (Surr)	102		70 - 130		02/08/14 09:05	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	J	5.0	0.18	ppb v/v			02/13/14 03:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	103		70 - 130		02/13/14 03:42	1
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/13/14 03:42	1
Toluene-d8 (Surr)	105		70 - 130		02/13/14 03:42	1

Client Sample ID: 095139-001/CWL-D1-100

Lab Sample ID: 320-5780-11

Date Collected: 01/16/14 09:07

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	25	ppb v/v			02/08/14 09:53	314
Benzyl chloride	ND		250	51	ppb v/v			02/08/14 09:53	314
Bromodichloromethane	ND		94	21	ppb v/v			02/08/14 09:53	314
Bromoform	ND		130	22	ppb v/v			02/08/14 09:53	314
Bromomethane	ND		250	110	ppb v/v			02/08/14 09:53	314
2-Butanone (MEK)	ND		250	62	ppb v/v			02/08/14 09:53	314
Carbon disulfide	ND		250	24	ppb v/v			02/08/14 09:53	314
Carbon tetrachloride	ND		250	20	ppb v/v			02/08/14 09:53	314
Chlorobenzene	ND		94	20	ppb v/v			02/08/14 09:53	314
Chloroethane	ND		250	97	ppb v/v			02/08/14 09:53	314
Chloroform	540		94	30	ppb v/v			02/08/14 09:53	314
Chloromethane	ND		250	62	ppb v/v			02/08/14 09:53	314
Dibromochloromethane	ND		130	25	ppb v/v			02/08/14 09:53	314
1,2-Dibromoethane (EDB)	ND		250	24	ppb v/v			02/08/14 09:53	314
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	49	ppb v/v			02/08/14 09:53	314
1,2-Dichlorobenzene	ND		130	41	ppb v/v			02/08/14 09:53	314
1,3-Dichlorobenzene	ND		130	35	ppb v/v			02/08/14 09:53	314
1,4-Dichlorobenzene	ND		130	47	ppb v/v			02/08/14 09:53	314
Dichlorodifluoromethane	ND		130	46	ppb v/v			02/08/14 09:53	314
1,1-Dichloroethane	ND		94	23	ppb v/v			02/08/14 09:53	314
1,2-Dichloroethane	61	J	250	28	ppb v/v			02/08/14 09:53	314
1,1-Dichloroethene	440		250	41	ppb v/v			02/08/14 09:53	314
cis-1,2-Dichloroethene	ND		130	28	ppb v/v			02/08/14 09:53	314
trans-1,2-Dichloroethene	ND		130	31	ppb v/v			02/08/14 09:53	314
1,2-Dichloropropane	95	J	130	75	ppb v/v			02/08/14 09:53	314
cis-1,3-Dichloropropene	ND		130	33	ppb v/v			02/08/14 09:53	314

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095139-001/CWL-D1-100

Lab Sample ID: 320-5780-11

Date Collected: 01/16/14 09:07

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		130	28	ppb v/v			02/08/14 09:53	314
Ethylbenzene	64	J	130	20	ppb v/v			02/08/14 09:53	314
4-Ethyltoluene	ND		130	59	ppb v/v			02/08/14 09:53	314
Hexachlorobutadiene	ND		630	140	ppb v/v			02/08/14 09:53	314
2-Hexanone	ND		130	27	ppb v/v			02/08/14 09:53	314
4-Methyl-2-pentanone (MIBK)	ND		130	42	ppb v/v			02/08/14 09:53	314
Methylene Chloride	48	J	130	23	ppb v/v			02/08/14 09:53	314
Styrene	ND		130	19	ppb v/v			02/08/14 09:53	314
1,1,2,2-Tetrachloroethane	ND		130	22	ppb v/v			02/08/14 09:53	314
Tetrachloroethene	740		130	16	ppb v/v			02/08/14 09:53	314
Toluene	340		130	16	ppb v/v			02/08/14 09:53	314
1,1,2-Trichloro-1,2,2-trifluoroethane	1300		130	51	ppb v/v			02/08/14 09:53	314
1,2,4-Trichlorobenzene	ND		630	140	ppb v/v			02/08/14 09:53	314
1,1,1-Trichloroethane	58	J	94	20	ppb v/v			02/08/14 09:53	314
1,1,2-Trichloroethane	ND		130	21	ppb v/v			02/08/14 09:53	314
Trichloroethene	9900		130	33	ppb v/v			02/08/14 09:53	314
Trichlorofluoromethane	300		130	62	ppb v/v			02/08/14 09:53	314
1,2,4-Trimethylbenzene	ND		250	51	ppb v/v			02/08/14 09:53	314
1,3,5-Trimethylbenzene	ND		130	39	ppb v/v			02/08/14 09:53	314
Vinyl acetate	ND		250	46	ppb v/v			02/08/14 09:53	314
Vinyl chloride	ND		130	38	ppb v/v			02/08/14 09:53	314
m,p-Xylene	280		250	31	ppb v/v			02/08/14 09:53	314
o-Xylene	82	J	130	17	ppb v/v			02/08/14 09:53	314
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		70 - 130					02/08/14 09:53	314
1,2-Dichloroethane-d4 (Surr)	98		70 - 130					02/08/14 09:53	314
Toluene-d8 (Surr)	104		70 - 130					02/08/14 09:53	314

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	870	J	1600	56	ppb v/v			02/13/14 07:45	314
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130					02/13/14 07:45	314
1,2-Dichloroethane-d4 (Surr)	97		70 - 130					02/13/14 07:45	314
Toluene-d8 (Surr)	107		70 - 130					02/13/14 07:45	314

Client Sample ID: 095140-001/CWL-D1-160

Lab Sample ID: 320-5780-12

Date Collected: 01/16/14 09:12

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		190	37	ppb v/v			02/08/14 10:41	470
Benzyl chloride	ND		380	77	ppb v/v			02/08/14 10:41	470
Bromodichloromethane	ND		140	31	ppb v/v			02/08/14 10:41	470
Bromoform	ND		190	33	ppb v/v			02/08/14 10:41	470

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095140-001/CWL-D1-160

Lab Sample ID: 320-5780-12

Date Collected: 01/16/14 09:12

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	ND		380	160	ppb v/v			02/08/14 10:41	470
2-Butanone (MEK)	ND		380	94	ppb v/v			02/08/14 10:41	470
Carbon disulfide	ND		380	37	ppb v/v			02/08/14 10:41	470
Carbon tetrachloride	ND		380	30	ppb v/v			02/08/14 10:41	470
Chlorobenzene	ND		140	30	ppb v/v			02/08/14 10:41	470
Chloroethane	ND		380	140	ppb v/v			02/08/14 10:41	470
Chloroform	490		140	45	ppb v/v			02/08/14 10:41	470
Chloromethane	ND		380	93	ppb v/v			02/08/14 10:41	470
Dibromochloromethane	ND		190	37	ppb v/v			02/08/14 10:41	470
1,2-Dibromoethane (EDB)	ND		380	35	ppb v/v			02/08/14 10:41	470
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		190	73	ppb v/v			02/08/14 10:41	470
1,2-Dichlorobenzene	ND		190	61	ppb v/v			02/08/14 10:41	470
1,3-Dichlorobenzene	ND		190	52	ppb v/v			02/08/14 10:41	470
1,4-Dichlorobenzene	ND		190	70	ppb v/v			02/08/14 10:41	470
Dichlorodifluoromethane	ND		190	68	ppb v/v			02/08/14 10:41	470
1,1-Dichloroethane	ND		140	34	ppb v/v			02/08/14 10:41	470
1,2-Dichloroethane	73 J		380	41	ppb v/v			02/08/14 10:41	470
1,1-Dichloroethene	770		380	61	ppb v/v			02/08/14 10:41	470
cis-1,2-Dichloroethene	ND		190	42	ppb v/v			02/08/14 10:41	470
trans-1,2-Dichloroethene	ND		190	47	ppb v/v			02/08/14 10:41	470
1,2-Dichloropropane	160 J		190	110	ppb v/v			02/08/14 10:41	470
cis-1,3-Dichloropropene	ND		190	49	ppb v/v			02/08/14 10:41	470
trans-1,3-Dichloropropene	ND		190	41	ppb v/v			02/08/14 10:41	470
Ethylbenzene	67 J		190	30	ppb v/v			02/08/14 10:41	470
4-Ethyltoluene	ND		190	88	ppb v/v			02/08/14 10:41	470
Hexachlorobutadiene	ND		940	200	ppb v/v			02/08/14 10:41	470
2-Hexanone	ND		190	41	ppb v/v			02/08/14 10:41	470
4-Methyl-2-pentanone (MIBK)	ND		190	63	ppb v/v			02/08/14 10:41	470
Methylene Chloride	67 J		190	34	ppb v/v			02/08/14 10:41	470
Styrene	ND		190	28	ppb v/v			02/08/14 10:41	470
1,1,1,2-Tetrachloroethane	ND		190	32	ppb v/v			02/08/14 10:41	470
Tetrachloroethene	560		190	24	ppb v/v			02/08/14 10:41	470
Toluene	330		190	24	ppb v/v			02/08/14 10:41	470
1,1,2-Trichloro-1,2,2-trifluoroethane	2000		190	77	ppb v/v			02/08/14 10:41	470
1,2,4-Trichlorobenzene	ND		940	200	ppb v/v			02/08/14 10:41	470
1,1,1-Trichloroethane	71 J		140	31	ppb v/v			02/08/14 10:41	470
1,1,2-Trichloroethane	ND		190	31	ppb v/v			02/08/14 10:41	470
Trichloroethene	16000		190	49	ppb v/v			02/08/14 10:41	470
Trichlorofluoromethane	470		190	92	ppb v/v			02/08/14 10:41	470
1,2,4-Trimethylbenzene	ND		380	76	ppb v/v			02/08/14 10:41	470
1,3,5-Trimethylbenzene	ND		190	59	ppb v/v			02/08/14 10:41	470
Vinyl acetate	ND		380	68	ppb v/v			02/08/14 10:41	470
Vinyl chloride	ND		190	56	ppb v/v			02/08/14 10:41	470
m,p-Xylene	300 J		380	47	ppb v/v			02/08/14 10:41	470
o-Xylene	92 J		190	25	ppb v/v			02/08/14 10:41	470

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130		02/08/14 10:41	470

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095140-001/CWL-D1-160

Lab Sample ID: 320-5780-12

Date Collected: 01/16/14 09:12

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		02/08/14 10:41	470
Toluene-d8 (Surr)	105		70 - 130		02/08/14 10:41	470

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	750	J	2400	84	ppb v/v			02/13/14 08:34	470

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130		02/13/14 08:34	470
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		02/13/14 08:34	470
Toluene-d8 (Surr)	107		70 - 130		02/13/14 08:34	470

Client Sample ID: 095141-001/CWL-D1-240

Lab Sample ID: 320-5780-13

Date Collected: 01/16/14 09:18

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		180	35	ppb v/v			02/08/14 11:30	443
Benzyl chloride	ND		350	72	ppb v/v			02/08/14 11:30	443
Bromodichloromethane	ND		130	29	ppb v/v			02/08/14 11:30	443
Bromoform	ND		180	31	ppb v/v			02/08/14 11:30	443
Bromomethane	ND		350	150	ppb v/v			02/08/14 11:30	443
2-Butanone (MEK)	ND		350	88	ppb v/v			02/08/14 11:30	443
Carbon disulfide	ND		350	35	ppb v/v			02/08/14 11:30	443
Carbon tetrachloride	65	J	350	28	ppb v/v			02/08/14 11:30	443
Chlorobenzene	ND		130	28	ppb v/v			02/08/14 11:30	443
Chloroethane	ND		350	140	ppb v/v			02/08/14 11:30	443
Chloroform	450		130	42	ppb v/v			02/08/14 11:30	443
Chloromethane	ND		350	87	ppb v/v			02/08/14 11:30	443
Dibromochloromethane	ND		180	35	ppb v/v			02/08/14 11:30	443
1,2-Dibromoethane (EDB)	ND		350	33	ppb v/v			02/08/14 11:30	443
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		180	69	ppb v/v			02/08/14 11:30	443
1,2-Dichlorobenzene	ND		180	58	ppb v/v			02/08/14 11:30	443
1,3-Dichlorobenzene	ND		180	49	ppb v/v			02/08/14 11:30	443
1,4-Dichlorobenzene	ND		180	66	ppb v/v			02/08/14 11:30	443
Dichlorodifluoromethane	72	J	180	64	ppb v/v			02/08/14 11:30	443
1,1-Dichloroethane	33	J	130	32	ppb v/v			02/08/14 11:30	443
1,2-Dichloroethane	72	J	350	39	ppb v/v			02/08/14 11:30	443
1,1-Dichloroethene	970		350	57	ppb v/v			02/08/14 11:30	443
cis-1,2-Dichloroethene	ND		180	39	ppb v/v			02/08/14 11:30	443
trans-1,2-Dichloroethene	ND		180	44	ppb v/v			02/08/14 11:30	443
1,2-Dichloropropane	180		180	110	ppb v/v			02/08/14 11:30	443
cis-1,3-Dichloropropene	ND		180	46	ppb v/v			02/08/14 11:30	443
trans-1,3-Dichloropropene	ND		180	39	ppb v/v			02/08/14 11:30	443
Ethylbenzene	72	J	180	28	ppb v/v			02/08/14 11:30	443
4-Ethyltoluene	ND		180	83	ppb v/v			02/08/14 11:30	443
Hexachlorobutadiene	ND		890	190	ppb v/v			02/08/14 11:30	443

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095141-001/CWL-D1-240

Lab Sample ID: 320-5780-13

Date Collected: 01/16/14 09:18

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Hexanone	ND		180	39	ppb v/v			02/08/14 11:30	443
4-Methyl-2-pentanone (MIBK)	ND		180	60	ppb v/v			02/08/14 11:30	443
Methylene Chloride	56	J	180	32	ppb v/v			02/08/14 11:30	443
Styrene	ND		180	26	ppb v/v			02/08/14 11:30	443
1,1,2,2-Tetrachloroethane	ND		180	31	ppb v/v			02/08/14 11:30	443
Tetrachloroethene	470		180	23	ppb v/v			02/08/14 11:30	443
Toluene	380		180	23	ppb v/v			02/08/14 11:30	443
1,1,2-Trichloro-1,2,2-trifluoroethane	2500		180	72	ppb v/v			02/08/14 11:30	443
1,2,4-Trichlorobenzene	ND		890	190	ppb v/v			02/08/14 11:30	443
1,1,1-Trichloroethane	66	J	130	29	ppb v/v			02/08/14 11:30	443
1,1,2-Trichloroethane	ND		180	30	ppb v/v			02/08/14 11:30	443
Trichloroethene	19000		180	47	ppb v/v			02/08/14 11:30	443
Trichlorofluoromethane	530		180	87	ppb v/v			02/08/14 11:30	443
1,2,4-Trimethylbenzene	ND		350	72	ppb v/v			02/08/14 11:30	443
1,3,5-Trimethylbenzene	ND		180	55	ppb v/v			02/08/14 11:30	443
Vinyl acetate	ND		350	64	ppb v/v			02/08/14 11:30	443
Vinyl chloride	ND		180	53	ppb v/v			02/08/14 11:30	443
m,p-Xylene	310	J	350	44	ppb v/v			02/08/14 11:30	443
o-Xylene	90	J	180	24	ppb v/v			02/08/14 11:30	443

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130		02/08/14 11:30	443
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		02/08/14 11:30	443
Toluene-d8 (Surr)	104		70 - 130		02/08/14 11:30	443

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	870	J	2200	79	ppb v/v			02/13/14 09:23	443

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130		02/13/14 09:23	443
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		02/13/14 09:23	443
Toluene-d8 (Surr)	105		70 - 130		02/13/14 09:23	443

Client Sample ID: 095142-001/CWL-D1-350

Lab Sample ID: 320-5780-14

Date Collected: 01/16/14 09:31

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		180	35	ppb v/v			02/08/14 12:18	442
Benzyl chloride	ND		350	72	ppb v/v			02/08/14 12:18	442
Bromodichloromethane	ND		130	29	ppb v/v			02/08/14 12:18	442
Bromoform	ND		180	31	ppb v/v			02/08/14 12:18	442
Bromomethane	ND		350	150	ppb v/v			02/08/14 12:18	442
2-Butanone (MEK)	ND		350	88	ppb v/v			02/08/14 12:18	442
Carbon disulfide	ND		350	34	ppb v/v			02/08/14 12:18	442
Carbon tetrachloride	ND		350	28	ppb v/v			02/08/14 12:18	442

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095142-001/CWL-D1-350

Lab Sample ID: 320-5780-14

Date Collected: 01/16/14 09:31

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorobenzene	ND		130	28	ppb v/v			02/08/14 12:18	442
Chloroethane	ND		350	140	ppb v/v			02/08/14 12:18	442
Chloroform	ND		130	42	ppb v/v			02/08/14 12:18	442
Chloromethane	ND		350	87	ppb v/v			02/08/14 12:18	442
Dibromochloromethane	ND		180	35	ppb v/v			02/08/14 12:18	442
1,2-Dibromoethane (EDB)	ND		350	33	ppb v/v			02/08/14 12:18	442
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		180	69	ppb v/v			02/08/14 12:18	442
1,2-Dichlorobenzene	ND		180	57	ppb v/v			02/08/14 12:18	442
1,3-Dichlorobenzene	ND		180	49	ppb v/v			02/08/14 12:18	442
1,4-Dichlorobenzene	ND		180	66	ppb v/v			02/08/14 12:18	442
Dichlorodifluoromethane	ND		180	64	ppb v/v			02/08/14 12:18	442
1,1-Dichloroethane	ND		130	32	ppb v/v			02/08/14 12:18	442
1,2-Dichloroethane	ND		350	39	ppb v/v			02/08/14 12:18	442
1,1-Dichloroethene	510		350	57	ppb v/v			02/08/14 12:18	442
cis-1,2-Dichloroethene	ND		180	39	ppb v/v			02/08/14 12:18	442
trans-1,2-Dichloroethene	ND		180	44	ppb v/v			02/08/14 12:18	442
1,2-Dichloropropane	ND		180	110	ppb v/v			02/08/14 12:18	442
cis-1,3-Dichloropropene	ND		180	46	ppb v/v			02/08/14 12:18	442
trans-1,3-Dichloropropene	ND		180	39	ppb v/v			02/08/14 12:18	442
Ethylbenzene	61 J		180	28	ppb v/v			02/08/14 12:18	442
4-Ethyltoluene	ND		180	83	ppb v/v			02/08/14 12:18	442
Hexachlorobutadiene	ND		880	190	ppb v/v			02/08/14 12:18	442
2-Hexanone	ND		180	38	ppb v/v			02/08/14 12:18	442
4-Methyl-2-pentanone (MIBK)	ND		180	60	ppb v/v			02/08/14 12:18	442
Methylene Chloride	61 J		180	32	ppb v/v			02/08/14 12:18	442
Styrene	ND		180	26	ppb v/v			02/08/14 12:18	442
1,1,1,2-Tetrachloroethane	ND		180	30	ppb v/v			02/08/14 12:18	442
Tetrachloroethene	220		180	23	ppb v/v			02/08/14 12:18	442
Toluene	310		180	23	ppb v/v			02/08/14 12:18	442
1,1,2-Trichloro-1,2,2-trifluoroethane	1300		180	72	ppb v/v			02/08/14 12:18	442
1,2,4-Trichlorobenzene	ND		880	190	ppb v/v			02/08/14 12:18	442
1,1,1-Trichloroethane	ND		130	29	ppb v/v			02/08/14 12:18	442
1,1,2-Trichloroethane	ND		180	30	ppb v/v			02/08/14 12:18	442
Trichloroethene	8500		180	46	ppb v/v			02/08/14 12:18	442
Trichlorofluoromethane	300		180	87	ppb v/v			02/08/14 12:18	442
1,2,4-Trimethylbenzene	ND		350	72	ppb v/v			02/08/14 12:18	442
1,3,5-Trimethylbenzene	ND		180	55	ppb v/v			02/08/14 12:18	442
Vinyl acetate	ND		350	64	ppb v/v			02/08/14 12:18	442
Vinyl chloride	ND		180	53	ppb v/v			02/08/14 12:18	442
m,p-Xylene	270 J		350	44	ppb v/v			02/08/14 12:18	442
o-Xylene	81 J		180	24	ppb v/v			02/08/14 12:18	442

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130		02/08/14 12:18	442
4-Bromofluorobenzene (Surr)	109		70 - 130		02/13/14 10:11	442
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		02/08/14 12:18	442
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		02/13/14 10:11	442
Toluene-d8 (Surr)	106		70 - 130		02/08/14 12:18	442

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095142-001/CWL-D1-350

Lab Sample ID: 320-5780-14

Date Collected: 01/16/14 09:31

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		70 - 130		02/13/14 10:11	442

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1200		1100	39	ppb v/v			02/13/14 20:35	221

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130		02/13/14 20:35	221
1,2-Dichloroethane-d4 (Surr)	98		70 - 130		02/13/14 20:35	221
Toluene-d8 (Surr)	106		70 - 130		02/13/14 20:35	221

Client Sample ID: 095143-001/CWL-D1-470

Lab Sample ID: 320-5780-15

Date Collected: 01/16/14 09:37

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	5.4	J	22	0.79	ppb v/v			02/10/14 02:43	4.45
Benzene	ND		5.4	1.1	ppb v/v			02/08/14 13:07	13.4
Benzyl chloride	ND		11	2.2	ppb v/v			02/08/14 13:07	13.4
Bromodichloromethane	ND		4.0	0.88	ppb v/v			02/08/14 13:07	13.4
Bromoform	ND		5.4	0.94	ppb v/v			02/08/14 13:07	13.4
Bromomethane	ND		11	4.5	ppb v/v			02/08/14 13:07	13.4
2-Butanone (MEK)	ND		11	2.7	ppb v/v			02/08/14 13:07	13.4
Carbon disulfide	ND		11	1.0	ppb v/v			02/08/14 13:07	13.4
Carbon tetrachloride	1.5	J	11	0.86	ppb v/v			02/08/14 13:07	13.4
Chlorobenzene	ND		4.0	0.86	ppb v/v			02/08/14 13:07	13.4
Chloroethane	ND		11	4.1	ppb v/v			02/08/14 13:07	13.4
Chloroform	1.5	J	4.0	1.3	ppb v/v			02/08/14 13:07	13.4
Chloromethane	ND		11	2.6	ppb v/v			02/08/14 13:07	13.4
Dibromochloromethane	ND		5.4	1.1	ppb v/v			02/08/14 13:07	13.4
1,2-Dibromoethane (EDB)	ND		11	1.0	ppb v/v			02/08/14 13:07	13.4
1,2-Dichloro-1,1,1,2-tetrafluoroethane	ND		5.4	2.1	ppb v/v			02/08/14 13:07	13.4
1,2-Dichlorobenzene	ND		5.4	1.7	ppb v/v			02/08/14 13:07	13.4
1,3-Dichlorobenzene	ND		5.4	1.5	ppb v/v			02/08/14 13:07	13.4
1,4-Dichlorobenzene	ND		5.4	2.0	ppb v/v			02/08/14 13:07	13.4
Dichlorodifluoromethane	8.7		5.4	1.9	ppb v/v			02/08/14 13:07	13.4
1,1-Dichloroethane	ND		4.0	0.96	ppb v/v			02/08/14 13:07	13.4
1,2-Dichloroethane	ND		11	1.2	ppb v/v			02/08/14 13:07	13.4
1,1-Dichloroethene	22		11	1.7	ppb v/v			02/08/14 13:07	13.4
cis-1,2-Dichloroethene	ND		5.4	1.2	ppb v/v			02/08/14 13:07	13.4
trans-1,2-Dichloroethene	ND		5.4	1.3	ppb v/v			02/08/14 13:07	13.4
1,2-Dichloropropane	ND		5.4	3.2	ppb v/v			02/08/14 13:07	13.4
cis-1,3-Dichloropropene	ND		5.4	1.4	ppb v/v			02/08/14 13:07	13.4
trans-1,3-Dichloropropene	ND		5.4	1.2	ppb v/v			02/08/14 13:07	13.4
Ethylbenzene	ND		5.4	0.84	ppb v/v			02/08/14 13:07	13.4
4-Ethyltoluene	ND		5.4	2.5	ppb v/v			02/08/14 13:07	13.4
Hexachlorobutadiene	ND		27	5.8	ppb v/v			02/08/14 13:07	13.4

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095143-001/CWL-D1-470

Lab Sample ID: 320-5780-15

Date Collected: 01/16/14 09:37

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Hexanone	ND		5.4	1.2	ppb v/v			02/08/14 13:07	13.4
4-Methyl-2-pentanone (MIBK)	ND		5.4	1.8	ppb v/v			02/08/14 13:07	13.4
Methylene Chloride	4.4	J	5.4	0.96	ppb v/v			02/08/14 13:07	13.4
Styrene	ND		5.4	0.79	ppb v/v			02/08/14 13:07	13.4
1,1,2,2-Tetrachloroethane	ND		5.4	0.92	ppb v/v			02/08/14 13:07	13.4
Tetrachloroethene	5.0	J	5.4	0.68	ppb v/v			02/08/14 13:07	13.4
Toluene	ND		5.4	0.68	ppb v/v			02/08/14 13:07	13.4
1,1,2-Trichloro-1,2,2-trifluoroethane	150		5.4	2.2	ppb v/v			02/08/14 13:07	13.4
1,2,4-Trichlorobenzene	ND		27	5.8	ppb v/v			02/08/14 13:07	13.4
1,1,1-Trichloroethane	ND		4.0	0.87	ppb v/v			02/08/14 13:07	13.4
1,1,2-Trichloroethane	ND		5.4	0.90	ppb v/v			02/08/14 13:07	13.4
Trichloroethene	160		5.4	1.4	ppb v/v			02/08/14 13:07	13.4
Trichlorofluoromethane	39		5.4	2.6	ppb v/v			02/08/14 13:07	13.4
1,2,4-Trimethylbenzene	ND		11	2.2	ppb v/v			02/08/14 13:07	13.4
1,3,5-Trimethylbenzene	ND		5.4	1.7	ppb v/v			02/08/14 13:07	13.4
Vinyl acetate	ND		11	1.9	ppb v/v			02/08/14 13:07	13.4
Vinyl chloride	ND		5.4	1.6	ppb v/v			02/08/14 13:07	13.4
m,p-Xylene	ND		11	1.3	ppb v/v			02/08/14 13:07	13.4
o-Xylene	ND		5.4	0.72	ppb v/v			02/08/14 13:07	13.4
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		70 - 130					02/08/14 13:07	13.4
4-Bromofluorobenzene (Surr)	104		70 - 130					02/10/14 02:43	4.45
1,2-Dichloroethane-d4 (Surr)	100		70 - 130					02/08/14 13:07	13.4
1,2-Dichloroethane-d4 (Surr)	98		70 - 130					02/10/14 02:43	4.45
Toluene-d8 (Surr)	105		70 - 130					02/08/14 13:07	13.4
Toluene-d8 (Surr)	106		70 - 130					02/10/14 02:43	4.45

Client Sample ID: 095144-001/CWL-D1-FB1

Lab Sample ID: 320-5780-16

Date Collected: 01/16/14 09:43

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40	0.079	ppb v/v			02/08/14 13:59	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/08/14 13:59	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/08/14 13:59	1
Bromoform	ND		0.40	0.070	ppb v/v			02/08/14 13:59	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/08/14 13:59	1
2-Butanone (MEK)	0.30	J	0.80	0.20	ppb v/v			02/08/14 13:59	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/08/14 13:59	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/08/14 13:59	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/08/14 13:59	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/08/14 13:59	1
Chloroform	ND		0.30	0.095	ppb v/v			02/08/14 13:59	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/08/14 13:59	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/08/14 13:59	1

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095144-001/CWL-D1-FB1

Lab Sample ID: 320-5780-16

Date Collected: 01/16/14 09:43

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/08/14 13:59	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/08/14 13:59	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/08/14 13:59	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/08/14 13:59	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/08/14 13:59	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			02/08/14 13:59	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/08/14 13:59	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/08/14 13:59	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/08/14 13:59	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/08/14 13:59	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/08/14 13:59	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/08/14 13:59	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/08/14 13:59	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/08/14 13:59	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/08/14 13:59	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/08/14 13:59	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/08/14 13:59	1
2-Hexanone	ND		0.40	0.087	ppb v/v			02/08/14 13:59	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			02/08/14 13:59	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			02/08/14 13:59	1
Styrene	ND		0.40	0.059	ppb v/v			02/08/14 13:59	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/08/14 13:59	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/08/14 13:59	1
Toluene	ND		0.40	0.051	ppb v/v			02/08/14 13:59	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/08/14 13:59	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/08/14 13:59	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/08/14 13:59	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/08/14 13:59	1
Trichloroethene	ND		0.40	0.11	ppb v/v			02/08/14 13:59	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/08/14 13:59	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/08/14 13:59	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/08/14 13:59	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/08/14 13:59	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/08/14 13:59	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			02/08/14 13:59	1
o-Xylene	ND		0.40	0.054	ppb v/v			02/08/14 13:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		70 - 130		02/08/14 13:59	1
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/08/14 13:59	1
Toluene-d8 (Surr)	105		70 - 130		02/08/14 13:59	1

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.9	J	5.0	0.18	ppb v/v			02/13/14 11:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	103		70 - 130		02/13/14 11:03	1
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		02/13/14 11:03	1

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095144-001/CWL-D1-FB1

Lab Sample ID: 320-5780-16

Date Collected: 01/16/14 09:43

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	105		70 - 130		02/13/14 11:03	1

Client Sample ID: 095145-001/CWL-D2-120

Lab Sample ID: 320-5780-17

Date Collected: 01/16/14 10:53

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	26	ppb v/v			02/08/14 14:47	324
Benzyl chloride	ND		260	53	ppb v/v			02/08/14 14:47	324
Bromodichloromethane	ND		97	21	ppb v/v			02/08/14 14:47	324
Bromoform	ND		130	23	ppb v/v			02/08/14 14:47	324
Bromomethane	ND		260	110	ppb v/v			02/08/14 14:47	324
2-Butanone (MEK)	65	J	260	64	ppb v/v			02/08/14 14:47	324
Carbon disulfide	ND		260	25	ppb v/v			02/08/14 14:47	324
Carbon tetrachloride	ND		260	21	ppb v/v			02/08/14 14:47	324
Chlorobenzene	ND		97	21	ppb v/v			02/08/14 14:47	324
Chloroethane	ND		260	100	ppb v/v			02/08/14 14:47	324
Chloroform	650		97	31	ppb v/v			02/08/14 14:47	324
Chloromethane	ND		260	64	ppb v/v			02/08/14 14:47	324
Dibromochloromethane	ND		130	26	ppb v/v			02/08/14 14:47	324
1,2-Dibromoethane (EDB)	ND		260	24	ppb v/v			02/08/14 14:47	324
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	50	ppb v/v			02/08/14 14:47	324
1,2-Dichlorobenzene	ND		130	42	ppb v/v			02/08/14 14:47	324
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/08/14 14:47	324
1,4-Dichlorobenzene	ND		130	48	ppb v/v			02/08/14 14:47	324
Dichlorodifluoromethane	49	J	130	47	ppb v/v			02/08/14 14:47	324
1,1-Dichloroethane	ND		97	23	ppb v/v			02/08/14 14:47	324
1,2-Dichloroethane	95	J	260	29	ppb v/v			02/08/14 14:47	324
1,1-Dichloroethene	560		260	42	ppb v/v			02/08/14 14:47	324
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/08/14 14:47	324
trans-1,2-Dichloroethene	ND		130	32	ppb v/v			02/08/14 14:47	324
1,2-Dichloropropane	210		130	78	ppb v/v			02/08/14 14:47	324
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/08/14 14:47	324
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/08/14 14:47	324
Ethylbenzene	74	J	130	20	ppb v/v			02/08/14 14:47	324
4-Ethyltoluene	ND		130	61	ppb v/v			02/08/14 14:47	324
Hexachlorobutadiene	ND		650	140	ppb v/v			02/08/14 14:47	324
2-Hexanone	ND		130	28	ppb v/v			02/08/14 14:47	324
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/08/14 14:47	324
Methylene Chloride	57	J	130	23	ppb v/v			02/08/14 14:47	324
Styrene	ND		130	19	ppb v/v			02/08/14 14:47	324
1,1,2,2-Tetrachloroethane	ND		130	22	ppb v/v			02/08/14 14:47	324
Tetrachloroethene	530		130	17	ppb v/v			02/08/14 14:47	324
Toluene	350		130	17	ppb v/v			02/08/14 14:47	324
1,1,2-Trichloro-1,2,2-trifluoroethane	1600		130	53	ppb v/v			02/08/14 14:47	324

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095145-001/CWL-D2-120

Lab Sample ID: 320-5780-17

Date Collected: 01/16/14 10:53

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		650	140	ppb v/v			02/08/14 14:47	324
1,1,1-Trichloroethane	65	J	97	21	ppb v/v			02/08/14 14:47	324
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 14:47	324
Trichloroethene	13000		130	34	ppb v/v			02/08/14 14:47	324
Trichlorofluoromethane	380		130	64	ppb v/v			02/08/14 14:47	324
1,2,4-Trimethylbenzene	ND		260	52	ppb v/v			02/08/14 14:47	324
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/08/14 14:47	324
Vinyl acetate	ND		260	47	ppb v/v			02/08/14 14:47	324
Vinyl chloride	ND		130	39	ppb v/v			02/08/14 14:47	324
m,p-Xylene	310		260	32	ppb v/v			02/08/14 14:47	324
o-Xylene	96	J	130	17	ppb v/v			02/08/14 14:47	324
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130					02/08/14 14:47	324
1,2-Dichloroethane-d4 (Surr)	99		70 - 130					02/08/14 14:47	324
Toluene-d8 (Surr)	105		70 - 130					02/08/14 14:47	324

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	400	J	1600	58	ppb v/v			02/13/14 21:24	324
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130					02/13/14 21:24	324
1,2-Dichloroethane-d4 (Surr)	97		70 - 130					02/13/14 21:24	324
Toluene-d8 (Surr)	105		70 - 130					02/13/14 21:24	324

Client Sample ID: 095146-001/CWL-D2-240

Lab Sample ID: 320-5780-18

Date Collected: 01/16/14 10:58

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		130	26	ppb v/v			02/08/14 15:36	328
Benzyl chloride	ND		260	53	ppb v/v			02/08/14 15:36	328
Bromodichloromethane	ND		98	22	ppb v/v			02/08/14 15:36	328
Bromoform	ND		130	23	ppb v/v			02/08/14 15:36	328
Bromomethane	ND		260	110	ppb v/v			02/08/14 15:36	328
2-Butanone (MEK)	ND		260	65	ppb v/v			02/08/14 15:36	328
Carbon disulfide	ND		260	26	ppb v/v			02/08/14 15:36	328
Carbon tetrachloride	53	J	260	21	ppb v/v			02/08/14 15:36	328
Chlorobenzene	ND		98	21	ppb v/v			02/08/14 15:36	328
Chloroethane	ND		260	100	ppb v/v			02/08/14 15:36	328
Chloroform	630		98	31	ppb v/v			02/08/14 15:36	328
Chloromethane	ND		260	65	ppb v/v			02/08/14 15:36	328
Dibromochloromethane	ND		130	26	ppb v/v			02/08/14 15:36	328
1,2-Dibromoethane (EDB)	ND		260	25	ppb v/v			02/08/14 15:36	328
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	51	ppb v/v			02/08/14 15:36	328
1,2-Dichlorobenzene	ND		130	43	ppb v/v			02/08/14 15:36	328

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095146-001/CWL-D2-240

Lab Sample ID: 320-5780-18

Date Collected: 01/16/14 10:58

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/08/14 15:36	328
1,4-Dichlorobenzene	ND		130	49	ppb v/v			02/08/14 15:36	328
Dichlorodifluoromethane	64	J	130	48	ppb v/v			02/08/14 15:36	328
1,1-Dichloroethane	32	J	98	24	ppb v/v			02/08/14 15:36	328
1,2-Dichloroethane	80	J	260	29	ppb v/v			02/08/14 15:36	328
1,1-Dichloroethene	760		260	42	ppb v/v			02/08/14 15:36	328
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/08/14 15:36	328
trans-1,2-Dichloroethene	ND		130	33	ppb v/v			02/08/14 15:36	328
1,2-Dichloropropane	290		130	79	ppb v/v			02/08/14 15:36	328
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/08/14 15:36	328
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/08/14 15:36	328
Ethylbenzene	61	J	130	21	ppb v/v			02/08/14 15:36	328
4-Ethyltoluene	ND		130	61	ppb v/v			02/08/14 15:36	328
Hexachlorobutadiene	ND		660	140	ppb v/v			02/08/14 15:36	328
2-Hexanone	ND		130	29	ppb v/v			02/08/14 15:36	328
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/08/14 15:36	328
Methylene Chloride	78	J	130	24	ppb v/v			02/08/14 15:36	328
Styrene	ND		130	19	ppb v/v			02/08/14 15:36	328
1,1,1,2-Tetrachloroethane	ND		130	23	ppb v/v			02/08/14 15:36	328
Tetrachloroethene	510		130	17	ppb v/v			02/08/14 15:36	328
Toluene	290		130	17	ppb v/v			02/08/14 15:36	328
1,1,2-Trichloro-1,2,2-trifluoroethane	2000		130	53	ppb v/v			02/08/14 15:36	328
1,2,4-Trichlorobenzene	ND		660	140	ppb v/v			02/08/14 15:36	328
1,1,1-Trichloroethane	63	J	98	21	ppb v/v			02/08/14 15:36	328
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/08/14 15:36	328
Trichloroethene	16000		130	34	ppb v/v			02/08/14 15:36	328
Trichlorofluoromethane	470		130	64	ppb v/v			02/08/14 15:36	328
1,2,4-Trimethylbenzene	ND		260	53	ppb v/v			02/08/14 15:36	328
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/08/14 15:36	328
Vinyl acetate	ND		260	48	ppb v/v			02/08/14 15:36	328
Vinyl chloride	ND		130	39	ppb v/v			02/08/14 15:36	328
m,p-Xylene	270		260	33	ppb v/v			02/08/14 15:36	328
o-Xylene	93	J	130	18	ppb v/v			02/08/14 15:36	328
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		70 - 130					02/08/14 15:36	328
1,2-Dichloroethane-d4 (Surr)	102		70 - 130					02/08/14 15:36	328
Toluene-d8 (Surr)	106		70 - 130					02/08/14 15:36	328

Method: TO-15 - Volatile Organic Compounds in Ambient Air - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	370	J	1400	49	ppb v/v			02/13/14 22:13	273
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130					02/13/14 22:13	273
1,2-Dichloroethane-d4 (Surr)	98		70 - 130					02/13/14 22:13	273
Toluene-d8 (Surr)	106		70 - 130					02/13/14 22:13	273

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095147-001/CWL-D2-350

Lab Sample ID: 320-5780-19

Date Collected: 01/16/14 11:04

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1300	J	1600	57	ppb v/v			02/09/14 15:48	320
Benzene	ND		130	25	ppb v/v			02/09/14 15:48	320
Benzyl chloride	ND		260	52	ppb v/v			02/09/14 15:48	320
Bromodichloromethane	ND		96	21	ppb v/v			02/09/14 15:48	320
Bromoform	ND		130	22	ppb v/v			02/09/14 15:48	320
Bromomethane	ND		260	110	ppb v/v			02/09/14 15:48	320
2-Butanone (MEK)	100	J	260	64	ppb v/v			02/09/14 15:48	320
Carbon disulfide	ND		260	25	ppb v/v			02/09/14 15:48	320
Carbon tetrachloride	ND		260	20	ppb v/v			02/09/14 15:48	320
Chlorobenzene	ND		96	20	ppb v/v			02/09/14 15:48	320
Chloroethane	ND		260	99	ppb v/v			02/09/14 15:48	320
Chloroform	360		96	30	ppb v/v			02/09/14 15:48	320
Chloromethane	ND		260	63	ppb v/v			02/09/14 15:48	320
Dibromochloromethane	ND		130	25	ppb v/v			02/09/14 15:48	320
1,2-Dibromoethane (EDB)	ND		260	24	ppb v/v			02/09/14 15:48	320
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	50	ppb v/v			02/09/14 15:48	320
1,2-Dichlorobenzene	ND		130	42	ppb v/v			02/09/14 15:48	320
1,3-Dichlorobenzene	ND		130	35	ppb v/v			02/09/14 15:48	320
1,4-Dichlorobenzene	ND		130	48	ppb v/v			02/09/14 15:48	320
Dichlorodifluoromethane	50	J	130	46	ppb v/v			02/09/14 15:48	320
1,1-Dichloroethane	ND		96	23	ppb v/v			02/09/14 15:48	320
1,2-Dichloroethane	75	J	260	28	ppb v/v			02/09/14 15:48	320
1,1-Dichloroethene	540		260	41	ppb v/v			02/09/14 15:48	320
cis-1,2-Dichloroethene	ND		130	28	ppb v/v			02/09/14 15:48	320
trans-1,2-Dichloroethene	ND		130	32	ppb v/v			02/09/14 15:48	320
1,2-Dichloropropane	130		130	77	ppb v/v			02/09/14 15:48	320
cis-1,3-Dichloropropene	ND		130	33	ppb v/v			02/09/14 15:48	320
trans-1,3-Dichloropropene	ND		130	28	ppb v/v			02/09/14 15:48	320
Ethylbenzene	100	J	130	20	ppb v/v			02/09/14 15:48	320
4-Ethyltoluene	ND		130	60	ppb v/v			02/09/14 15:48	320
Hexachlorobutadiene	ND		640	140	ppb v/v			02/09/14 15:48	320
2-Hexanone	ND		130	28	ppb v/v			02/09/14 15:48	320
4-Methyl-2-pentanone (MIBK)	49	J	130	43	ppb v/v			02/09/14 15:48	320
Methylene Chloride	90	J	130	23	ppb v/v			02/09/14 15:48	320
Styrene	46	J	130	19	ppb v/v			02/09/14 15:48	320
1,1,1,2-Tetrachloroethane	ND		130	22	ppb v/v			02/09/14 15:48	320
Tetrachloroethene	340		130	16	ppb v/v			02/09/14 15:48	320
Toluene	490		130	16	ppb v/v			02/09/14 15:48	320
1,1,2-Trichloro-1,2,2-trifluoroethane	1500		130	52	ppb v/v			02/09/14 15:48	320
1,2,4-Trichlorobenzene	ND		640	140	ppb v/v			02/09/14 15:48	320
1,1,1-Trichloroethane	43	J	96	21	ppb v/v			02/09/14 15:48	320
1,1,2-Trichloroethane	ND		130	21	ppb v/v			02/09/14 15:48	320
Trichloroethene	9900		130	34	ppb v/v			02/09/14 15:48	320
Trichlorofluoromethane	350		130	63	ppb v/v			02/09/14 15:48	320
1,2,4-Trimethylbenzene	ND		260	52	ppb v/v			02/09/14 15:48	320
1,3,5-Trimethylbenzene	ND		130	40	ppb v/v			02/09/14 15:48	320
Vinyl acetate	ND		260	46	ppb v/v			02/09/14 15:48	320
Vinyl chloride	ND		130	38	ppb v/v			02/09/14 15:48	320

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095147-001/CWL-D2-350

Lab Sample ID: 320-5780-19

Date Collected: 01/16/14 11:04

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
m,p-Xylene	440		260	32	ppb v/v			02/09/14 15:48	320
o-Xylene	140		130	17	ppb v/v			02/09/14 15:48	320
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		70 - 130					02/09/14 15:48	320
1,2-Dichloroethane-d4 (Surr)	100		70 - 130					02/09/14 15:48	320
Toluene-d8 (Surr)	107		70 - 130					02/09/14 15:48	320

Client Sample ID: 095148-001/CWL-D2-440

Lab Sample ID: 320-5780-20

Date Collected: 01/16/14 11:10

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	36		31	1.1	ppb v/v			02/09/14 16:37	6.25
Benzene	ND		2.5	0.49	ppb v/v			02/09/14 16:37	6.25
Benzyl chloride	ND		5.0	1.0	ppb v/v			02/09/14 16:37	6.25
Bromodichloromethane	ND		1.9	0.41	ppb v/v			02/09/14 16:37	6.25
Bromoform	ND		2.5	0.44	ppb v/v			02/09/14 16:37	6.25
Bromomethane	ND		5.0	2.1	ppb v/v			02/09/14 16:37	6.25
2-Butanone (MEK)	5.0		5.0	1.2	ppb v/v			02/09/14 16:37	6.25
Carbon disulfide	ND		5.0	0.49	ppb v/v			02/09/14 16:37	6.25
Carbon tetrachloride	0.44	J	5.0	0.40	ppb v/v			02/09/14 16:37	6.25
Chlorobenzene	ND		1.9	0.40	ppb v/v			02/09/14 16:37	6.25
Chloroethane	ND		5.0	1.9	ppb v/v			02/09/14 16:37	6.25
Chloroform	4.5		1.9	0.59	ppb v/v			02/09/14 16:37	6.25
Chloromethane	ND		5.0	1.2	ppb v/v			02/09/14 16:37	6.25
Dibromochloromethane	ND		2.5	0.49	ppb v/v			02/09/14 16:37	6.25
1,2-Dibromoethane (EDB)	ND		5.0	0.47	ppb v/v			02/09/14 16:37	6.25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		2.5	0.97	ppb v/v			02/09/14 16:37	6.25
1,2-Dichlorobenzene	ND		2.5	0.81	ppb v/v			02/09/14 16:37	6.25
1,3-Dichlorobenzene	ND		2.5	0.69	ppb v/v			02/09/14 16:37	6.25
1,4-Dichlorobenzene	ND		2.5	0.93	ppb v/v			02/09/14 16:37	6.25
Dichlorodifluoromethane	0.98	J	2.5	0.91	ppb v/v			02/09/14 16:37	6.25
1,1-Dichloroethane	ND		1.9	0.45	ppb v/v			02/09/14 16:37	6.25
1,2-Dichloroethane	ND		5.0	0.55	ppb v/v			02/09/14 16:37	6.25
1,1-Dichloroethene	7.5		5.0	0.81	ppb v/v			02/09/14 16:37	6.25
cis-1,2-Dichloroethene	ND		2.5	0.56	ppb v/v			02/09/14 16:37	6.25
trans-1,2-Dichloroethene	ND		2.5	0.63	ppb v/v			02/09/14 16:37	6.25
1,2-Dichloropropane	ND		2.5	1.5	ppb v/v			02/09/14 16:37	6.25
cis-1,3-Dichloropropene	ND		2.5	0.65	ppb v/v			02/09/14 16:37	6.25
trans-1,3-Dichloropropene	ND		2.5	0.55	ppb v/v			02/09/14 16:37	6.25
Ethylbenzene	ND		2.5	0.39	ppb v/v			02/09/14 16:37	6.25
4-Ethyltoluene	ND		2.5	1.2	ppb v/v			02/09/14 16:37	6.25
Hexachlorobutadiene	ND		13	2.7	ppb v/v			02/09/14 16:37	6.25
2-Hexanone	ND		2.5	0.54	ppb v/v			02/09/14 16:37	6.25
4-Methyl-2-pentanone (MIBK)	ND		2.5	0.84	ppb v/v			02/09/14 16:37	6.25
Methylene Chloride	ND		2.5	0.45	ppb v/v			02/09/14 16:37	6.25

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095148-001/CWL-D2-440

Lab Sample ID: 320-5780-20

Date Collected: 01/16/14 11:10

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	ND		2.5	0.37	ppb v/v			02/09/14 16:37	6.25
1,1,2,2-Tetrachloroethane	ND		2.5	0.43	ppb v/v			02/09/14 16:37	6.25
Tetrachloroethene	4.7		2.5	0.32	ppb v/v			02/09/14 16:37	6.25
Toluene	ND		2.5	0.32	ppb v/v			02/09/14 16:37	6.25
1,1,2-Trichloro-1,2,2-trifluoroethane	13		2.5	1.0	ppb v/v			02/09/14 16:37	6.25
1,2,4-Trichlorobenzene	ND		13	2.7	ppb v/v			02/09/14 16:37	6.25
1,1,1-Trichloroethane	ND		1.9	0.41	ppb v/v			02/09/14 16:37	6.25
1,1,2-Trichloroethane	ND		2.5	0.42	ppb v/v			02/09/14 16:37	6.25
Trichloroethene	140		2.5	0.66	ppb v/v			02/09/14 16:37	6.25
Trichlorofluoromethane	4.5		2.5	1.2	ppb v/v			02/09/14 16:37	6.25
1,2,4-Trimethylbenzene	ND		5.0	1.0	ppb v/v			02/09/14 16:37	6.25
1,3,5-Trimethylbenzene	ND		2.5	0.78	ppb v/v			02/09/14 16:37	6.25
Vinyl acetate	ND		5.0	0.91	ppb v/v			02/09/14 16:37	6.25
Vinyl chloride	ND		2.5	0.75	ppb v/v			02/09/14 16:37	6.25
m,p-Xylene	ND		5.0	0.63	ppb v/v			02/09/14 16:37	6.25
o-Xylene	ND		2.5	0.34	ppb v/v			02/09/14 16:37	6.25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130					02/09/14 16:37	6.25
1,2-Dichloroethane-d4 (Surr)	98		70 - 130					02/09/14 16:37	6.25
Toluene-d8 (Surr)	107		70 - 130					02/09/14 16:37	6.25

Client Sample ID: 095149-001/CWL-D2-470

Lab Sample ID: 320-5780-21

Date Collected: 01/16/14 11:15

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1600		650	23	ppb v/v			02/10/14 09:14	130
Benzene	19	J	52	10	ppb v/v			02/10/14 09:14	130
Benzyl chloride	22	J	100	21	ppb v/v			02/10/14 09:14	130
Bromodichloromethane	ND		39	8.6	ppb v/v			02/10/14 09:14	130
Bromoform	ND		52	9.1	ppb v/v			02/10/14 09:14	130
Bromomethane	ND		100	44	ppb v/v			02/10/14 09:14	130
2-Butanone (MEK)	140		100	26	ppb v/v			02/10/14 09:14	130
Carbon disulfide	ND		100	10	ppb v/v			02/10/14 09:14	130
Carbon tetrachloride	ND		100	8.3	ppb v/v			02/10/14 09:14	130
Chlorobenzene	ND		39	8.3	ppb v/v			02/10/14 09:14	130
Chloroethane	ND		100	40	ppb v/v			02/10/14 09:14	130
Chloroform	330		39	12	ppb v/v			02/10/14 09:14	130
Chloromethane	ND		100	26	ppb v/v			02/10/14 09:14	130
Dibromochloromethane	ND		52	10	ppb v/v			02/10/14 09:14	130
1,2-Dibromoethane (EDB)	ND		100	9.8	ppb v/v			02/10/14 09:14	130
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		52	20	ppb v/v			02/10/14 09:14	130
1,2-Dichlorobenzene	24	J	52	17	ppb v/v			02/10/14 09:14	130
1,3-Dichlorobenzene	21	J	52	14	ppb v/v			02/10/14 09:14	130
1,4-Dichlorobenzene	23	J	52	19	ppb v/v			02/10/14 09:14	130

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095149-001/CWL-D2-470

Lab Sample ID: 320-5780-21

Date Collected: 01/16/14 11:15

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	23	J	52	19	ppb v/v			02/10/14 09:14	130
1,1-Dichloroethane	12	J	39	9.4	ppb v/v			02/10/14 09:14	130
1,2-Dichloroethane	82	J	100	11	ppb v/v			02/10/14 09:14	130
1,1-Dichloroethene	200		100	17	ppb v/v			02/10/14 09:14	130
cis-1,2-Dichloroethene	ND		52	12	ppb v/v			02/10/14 09:14	130
trans-1,2-Dichloroethene	ND		52	13	ppb v/v			02/10/14 09:14	130
1,2-Dichloropropane	80		52	31	ppb v/v			02/10/14 09:14	130
cis-1,3-Dichloropropene	ND		52	14	ppb v/v			02/10/14 09:14	130
trans-1,3-Dichloropropene	ND		52	11	ppb v/v			02/10/14 09:14	130
Ethylbenzene	120		52	8.2	ppb v/v			02/10/14 09:14	130
4-Ethyltoluene	32	J	52	24	ppb v/v			02/10/14 09:14	130
Hexachlorobutadiene	ND		260	56	ppb v/v			02/10/14 09:14	130
2-Hexanone	38	J	52	11	ppb v/v			02/10/14 09:14	130
4-Methyl-2-pentanone (MIBK)	41	J	52	18	ppb v/v			02/10/14 09:14	130
Methylene Chloride	48	J	52	9.4	ppb v/v			02/10/14 09:14	130
Styrene	55		52	7.7	ppb v/v			02/10/14 09:14	130
1,1,2,2-Tetrachloroethane	ND		52	9.0	ppb v/v			02/10/14 09:14	130
Tetrachloroethene	260		52	6.6	ppb v/v			02/10/14 09:14	130
Toluene	620		52	6.6	ppb v/v			02/10/14 09:14	130
1,1,2-Trichloro-1,2,2-trifluoroethane	600		52	21	ppb v/v			02/10/14 09:14	130
1,2,4-Trichlorobenzene	89	J	260	56	ppb v/v			02/10/14 09:14	130
1,1,1-Trichloroethane	40		39	8.5	ppb v/v			02/10/14 09:14	130
1,1,2-Trichloroethane	ND		52	8.7	ppb v/v			02/10/14 09:14	130
Trichloroethene	4700		52	14	ppb v/v			02/10/14 09:14	130
Trichlorofluoromethane	160		52	25	ppb v/v			02/10/14 09:14	130
1,2,4-Trimethylbenzene	44	J	100	21	ppb v/v			02/10/14 09:14	130
1,3,5-Trimethylbenzene	23	J	52	16	ppb v/v			02/10/14 09:14	130
Vinyl acetate	ND		100	19	ppb v/v			02/10/14 09:14	130
Vinyl chloride	ND		52	16	ppb v/v			02/10/14 09:14	130
m,p-Xylene	530		100	13	ppb v/v			02/10/14 09:14	130
o-Xylene	160		52	7.0	ppb v/v			02/10/14 09:14	130

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/09/14 17:26	325
4-Bromofluorobenzene (Surr)	109		70 - 130		02/10/14 09:14	130
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/09/14 17:26	325
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/10/14 09:14	130
Toluene-d8 (Surr)	107		70 - 130		02/09/14 17:26	325
Toluene-d8 (Surr)	109		70 - 130		02/10/14 09:14	130

Client Sample ID: 095150-001/CWL-D2-FB1

Lab Sample ID: 320-5780-22

Date Collected: 01/16/14 10:47

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	ND		5.0	0.18	ppb v/v			02/09/14 18:20	1

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095150-001/CWL-D2-FB1

Lab Sample ID: 320-5780-22

Date Collected: 01/16/14 10:47

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40	0.079	ppb v/v			02/09/14 18:20	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/09/14 18:20	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/09/14 18:20	1
Bromoform	ND		0.40	0.070	ppb v/v			02/09/14 18:20	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/09/14 18:20	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			02/09/14 18:20	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/09/14 18:20	1
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/09/14 18:20	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/09/14 18:20	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/09/14 18:20	1
Chloroform	ND		0.30	0.095	ppb v/v			02/09/14 18:20	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/09/14 18:20	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/09/14 18:20	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/09/14 18:20	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/09/14 18:20	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/09/14 18:20	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/09/14 18:20	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/09/14 18:20	1
Dichlorodifluoromethane	ND		0.40	0.15	ppb v/v			02/09/14 18:20	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/09/14 18:20	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/09/14 18:20	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/09/14 18:20	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/09/14 18:20	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/09/14 18:20	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/09/14 18:20	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/09/14 18:20	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/09/14 18:20	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/09/14 18:20	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/09/14 18:20	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/09/14 18:20	1
2-Hexanone	ND		0.40	0.087	ppb v/v			02/09/14 18:20	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			02/09/14 18:20	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			02/09/14 18:20	1
Styrene	ND		0.40	0.059	ppb v/v			02/09/14 18:20	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/09/14 18:20	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/09/14 18:20	1
Toluene	ND		0.40	0.051	ppb v/v			02/09/14 18:20	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/09/14 18:20	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/09/14 18:20	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/09/14 18:20	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/09/14 18:20	1
Trichloroethene	0.39	J	0.40	0.11	ppb v/v			02/09/14 18:20	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/09/14 18:20	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/09/14 18:20	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/09/14 18:20	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/09/14 18:20	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/09/14 18:20	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			02/09/14 18:20	1

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095150-001/CWL-D2-FB1

Lab Sample ID: 320-5780-22

Date Collected: 01/16/14 10:47

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		0.40	0.054	ppb v/v			02/09/14 18:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		70 - 130					02/09/14 18:20	1
1,2-Dichloroethane-d4 (Surr)	99		70 - 130					02/09/14 18:20	1
Toluene-d8 (Surr)	104		70 - 130					02/09/14 18:20	1

Client Sample ID: 095151-001/CWL-D3-120

Lab Sample ID: 320-5780-23

Date Collected: 01/16/14 11:37

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1400		820	29	ppb v/v			02/09/14 19:09	164
Benzene	15	J	66	13	ppb v/v			02/09/14 19:09	164
Benzyl chloride	ND		130	27	ppb v/v			02/09/14 19:09	164
Bromodichloromethane	ND		49	11	ppb v/v			02/09/14 19:09	164
Bromoform	ND		66	11	ppb v/v			02/09/14 19:09	164
Bromomethane	ND		130	55	ppb v/v			02/09/14 19:09	164
2-Butanone (MEK)	110	J	130	33	ppb v/v			02/09/14 19:09	164
Carbon disulfide	ND		130	13	ppb v/v			02/09/14 19:09	164
Carbon tetrachloride	ND		130	10	ppb v/v			02/09/14 19:09	164
Chlorobenzene	ND		49	10	ppb v/v			02/09/14 19:09	164
Chloroethane	ND		130	51	ppb v/v			02/09/14 19:09	164
Chloroform	160		49	16	ppb v/v			02/09/14 19:09	164
Chloromethane	ND		130	32	ppb v/v			02/09/14 19:09	164
Dibromochloromethane	ND		66	13	ppb v/v			02/09/14 19:09	164
1,2-Dibromoethane (EDB)	ND		130	12	ppb v/v			02/09/14 19:09	164
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		66	25	ppb v/v			02/09/14 19:09	164
1,2-Dichlorobenzene	ND		66	21	ppb v/v			02/09/14 19:09	164
1,3-Dichlorobenzene	ND		66	18	ppb v/v			02/09/14 19:09	164
1,4-Dichlorobenzene	ND		66	24	ppb v/v			02/09/14 19:09	164
Dichlorodifluoromethane	ND		66	24	ppb v/v			02/09/14 19:09	164
1,1-Dichloroethane	ND		49	12	ppb v/v			02/09/14 19:09	164
1,2-Dichloroethane	70	J	130	14	ppb v/v			02/09/14 19:09	164
1,1-Dichloroethene	200		130	21	ppb v/v			02/09/14 19:09	164
cis-1,2-Dichloroethene	ND		66	15	ppb v/v			02/09/14 19:09	164
trans-1,2-Dichloroethene	ND		66	16	ppb v/v			02/09/14 19:09	164
1,2-Dichloropropane	90		66	39	ppb v/v			02/09/14 19:09	164
cis-1,3-Dichloropropene	ND		66	17	ppb v/v			02/09/14 19:09	164
trans-1,3-Dichloropropene	ND		66	14	ppb v/v			02/09/14 19:09	164
Ethylbenzene	90		66	10	ppb v/v			02/09/14 19:09	164
4-Ethyltoluene	ND		66	31	ppb v/v			02/09/14 19:09	164
Hexachlorobutadiene	ND		330	71	ppb v/v			02/09/14 19:09	164
2-Hexanone	ND		66	14	ppb v/v			02/09/14 19:09	164
4-Methyl-2-pentanone (MIBK)	ND		66	22	ppb v/v			02/09/14 19:09	164
Methylene Chloride	54	J	66	12	ppb v/v			02/09/14 19:09	164
Styrene	45	J	66	9.7	ppb v/v			02/09/14 19:09	164

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095151-001/CWL-D3-120

Lab Sample ID: 320-5780-23

Date Collected: 01/16/14 11:37

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		66	11	ppb v/v			02/09/14 19:09	164
Tetrachloroethene	99		66	8.4	ppb v/v			02/09/14 19:09	164
Toluene	460		66	8.4	ppb v/v			02/09/14 19:09	164
1,1,2-Trichloro-1,2,2-trifluoroethane	630		66	27	ppb v/v			02/09/14 19:09	164
1,2,4-Trichlorobenzene	ND		330	71	ppb v/v			02/09/14 19:09	164
1,1,1-Trichloroethane	16 J		49	11	ppb v/v			02/09/14 19:09	164
1,1,2-Trichloroethane	ND		66	11	ppb v/v			02/09/14 19:09	164
Trichloroethene	4100		66	17	ppb v/v			02/09/14 19:09	164
Trichlorofluoromethane	160		66	32	ppb v/v			02/09/14 19:09	164
1,2,4-Trimethylbenzene	30 J		130	27	ppb v/v			02/09/14 19:09	164
1,3,5-Trimethylbenzene	ND		66	21	ppb v/v			02/09/14 19:09	164
Vinyl acetate	ND		130	24	ppb v/v			02/09/14 19:09	164
Vinyl chloride	ND		66	20	ppb v/v			02/09/14 19:09	164
m,p-Xylene	440		130	16	ppb v/v			02/09/14 19:09	164
o-Xylene	150		66	8.9	ppb v/v			02/09/14 19:09	164

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/09/14 19:09	164
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/09/14 19:09	164
Toluene-d8 (Surr)	107		70 - 130		02/09/14 19:09	164

Client Sample ID: 095152-001/CWL-D3-170

Lab Sample ID: 320-5780-24

Date Collected: 01/16/14 11:41

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1400		810	29	ppb v/v			02/09/14 19:58	161
Benzene	19 J		64	13	ppb v/v			02/09/14 19:58	161
Benzyl chloride	ND		130	26	ppb v/v			02/09/14 19:58	161
Bromodichloromethane	ND		48	11	ppb v/v			02/09/14 19:58	161
Bromoform	ND		64	11	ppb v/v			02/09/14 19:58	161
Bromomethane	ND		130	54	ppb v/v			02/09/14 19:58	161
2-Butanone (MEK)	120 J		130	32	ppb v/v			02/09/14 19:58	161
Carbon disulfide	ND		130	13	ppb v/v			02/09/14 19:58	161
Carbon tetrachloride	ND		130	10	ppb v/v			02/09/14 19:58	161
Chlorobenzene	ND		48	10	ppb v/v			02/09/14 19:58	161
Chloroethane	ND		130	50	ppb v/v			02/09/14 19:58	161
Chloroform	160		48	15	ppb v/v			02/09/14 19:58	161
Chloromethane	ND		130	32	ppb v/v			02/09/14 19:58	161
Dibromochloromethane	ND		64	13	ppb v/v			02/09/14 19:58	161
1,2-Dibromoethane (EDB)	ND		130	12	ppb v/v			02/09/14 19:58	161
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		64	25	ppb v/v			02/09/14 19:58	161
1,2-Dichlorobenzene	ND		64	21	ppb v/v			02/09/14 19:58	161
1,3-Dichlorobenzene	ND		64	18	ppb v/v			02/09/14 19:58	161
1,4-Dichlorobenzene	ND		64	24	ppb v/v			02/09/14 19:58	161
Dichlorodifluoromethane	28 J		64	23	ppb v/v			02/09/14 19:58	161

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095152-001/CWL-D3-170

Lab Sample ID: 320-5780-24

Date Collected: 01/16/14 11:41

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethane	ND		48	12	ppb v/v			02/09/14 19:58	161
1,2-Dichloroethane	94	J	130	14	ppb v/v			02/09/14 19:58	161
1,1-Dichloroethene	260		130	21	ppb v/v			02/09/14 19:58	161
cis-1,2-Dichloroethene	ND		64	14	ppb v/v			02/09/14 19:58	161
trans-1,2-Dichloroethene	ND		64	16	ppb v/v			02/09/14 19:58	161
1,2-Dichloropropane	120		64	39	ppb v/v			02/09/14 19:58	161
cis-1,3-Dichloropropene	ND		64	17	ppb v/v			02/09/14 19:58	161
trans-1,3-Dichloropropene	ND		64	14	ppb v/v			02/09/14 19:58	161
Ethylbenzene	120		64	10	ppb v/v			02/09/14 19:58	161
4-Ethyltoluene	ND		64	30	ppb v/v			02/09/14 19:58	161
Hexachlorobutadiene	ND		320	70	ppb v/v			02/09/14 19:58	161
2-Hexanone	ND		64	14	ppb v/v			02/09/14 19:58	161
4-Methyl-2-pentanone (MIBK)	35	J	64	22	ppb v/v			02/09/14 19:58	161
Methylene Chloride	51	J	64	12	ppb v/v			02/09/14 19:58	161
Styrene	ND		64	9.5	ppb v/v			02/09/14 19:58	161
1,1,2,2-Tetrachloroethane	ND		64	11	ppb v/v			02/09/14 19:58	161
Tetrachloroethene	110		64	8.2	ppb v/v			02/09/14 19:58	161
Toluene	640		64	8.2	ppb v/v			02/09/14 19:58	161
1,1,2-Trichloro-1,2,2-trifluoroethane	800		64	26	ppb v/v			02/09/14 19:58	161
1,2,4-Trichlorobenzene	ND		320	70	ppb v/v			02/09/14 19:58	161
1,1,1-Trichloroethane	17	J	48	10	ppb v/v			02/09/14 19:58	161
1,1,2-Trichloroethane	ND		64	11	ppb v/v			02/09/14 19:58	161
Trichloroethene	5400		64	17	ppb v/v			02/09/14 19:58	161
Trichlorofluoromethane	200		64	32	ppb v/v			02/09/14 19:58	161
1,2,4-Trimethylbenzene	ND		130	26	ppb v/v			02/09/14 19:58	161
1,3,5-Trimethylbenzene	ND		64	20	ppb v/v			02/09/14 19:58	161
Vinyl acetate	ND		130	23	ppb v/v			02/09/14 19:58	161
Vinyl chloride	ND		64	19	ppb v/v			02/09/14 19:58	161
m,p-Xylene	530		130	16	ppb v/v			02/09/14 19:58	161
o-Xylene	150		64	8.7	ppb v/v			02/09/14 19:58	161

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/09/14 19:58	161
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		02/09/14 19:58	161
Toluene-d8 (Surr)	110		70 - 130		02/09/14 19:58	161

Client Sample ID: 095153-001/CWL-D3-350

Lab Sample ID: 320-5780-25

Date Collected: 01/16/14 11:46

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1100	J	1600	58	ppb v/v			02/09/14 20:47	324
Benzene	ND		130	26	ppb v/v			02/09/14 20:47	324
Benzyl chloride	ND		260	53	ppb v/v			02/09/14 20:47	324
Bromodichloromethane	ND		97	21	ppb v/v			02/09/14 20:47	324
Bromoform	ND		130	23	ppb v/v			02/09/14 20:47	324

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095153-001/CWL-D3-350

Lab Sample ID: 320-5780-25

Date Collected: 01/16/14 11:46

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromomethane	ND		260	110	ppb v/v			02/09/14 20:47	324
2-Butanone (MEK)	85	J	260	64	ppb v/v			02/09/14 20:47	324
Carbon disulfide	ND		260	25	ppb v/v			02/09/14 20:47	324
Carbon tetrachloride	ND		260	21	ppb v/v			02/09/14 20:47	324
Chlorobenzene	ND		97	21	ppb v/v			02/09/14 20:47	324
Chloroethane	ND		260	100	ppb v/v			02/09/14 20:47	324
Chloroform	140		97	31	ppb v/v			02/09/14 20:47	324
Chloromethane	ND		260	64	ppb v/v			02/09/14 20:47	324
Dibromochloromethane	ND		130	26	ppb v/v			02/09/14 20:47	324
1,2-Dibromoethane (EDB)	ND		260	24	ppb v/v			02/09/14 20:47	324
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	50	ppb v/v			02/09/14 20:47	324
1,2-Dichlorobenzene	ND		130	42	ppb v/v			02/09/14 20:47	324
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/09/14 20:47	324
1,4-Dichlorobenzene	ND		130	48	ppb v/v			02/09/14 20:47	324
Dichlorodifluoromethane	ND		130	47	ppb v/v			02/09/14 20:47	324
1,1-Dichloroethane	ND		97	23	ppb v/v			02/09/14 20:47	324
1,2-Dichloroethane	52	J	260	29	ppb v/v			02/09/14 20:47	324
1,1-Dichloroethene	270		260	42	ppb v/v			02/09/14 20:47	324
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/09/14 20:47	324
trans-1,2-Dichloroethene	ND		130	32	ppb v/v			02/09/14 20:47	324
1,2-Dichloropropane	99	J	130	78	ppb v/v			02/09/14 20:47	324
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/09/14 20:47	324
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/09/14 20:47	324
Ethylbenzene	89	J	130	20	ppb v/v			02/09/14 20:47	324
4-Ethyltoluene	ND		130	61	ppb v/v			02/09/14 20:47	324
Hexachlorobutadiene	ND		650	140	ppb v/v			02/09/14 20:47	324
2-Hexanone	ND		130	28	ppb v/v			02/09/14 20:47	324
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/09/14 20:47	324
Methylene Chloride	340		130	23	ppb v/v			02/09/14 20:47	324
Styrene	61	J	130	19	ppb v/v			02/09/14 20:47	324
1,1,1,2-Tetrachloroethane	ND		130	22	ppb v/v			02/09/14 20:47	324
Tetrachloroethene	97	J	130	17	ppb v/v			02/09/14 20:47	324
Toluene	1100		130	17	ppb v/v			02/09/14 20:47	324
1,1,2-Trichloro-1,2,2-trifluoroethane	840		130	53	ppb v/v			02/09/14 20:47	324
1,2,4-Trichlorobenzene	ND		650	140	ppb v/v			02/09/14 20:47	324
1,1,1-Trichloroethane	ND		97	21	ppb v/v			02/09/14 20:47	324
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/09/14 20:47	324
Trichloroethene	5300		130	34	ppb v/v			02/09/14 20:47	324
Trichlorofluoromethane	210		130	64	ppb v/v			02/09/14 20:47	324
1,2,4-Trimethylbenzene	ND		260	52	ppb v/v			02/09/14 20:47	324
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/09/14 20:47	324
Vinyl acetate	ND		260	47	ppb v/v			02/09/14 20:47	324
Vinyl chloride	ND		130	39	ppb v/v			02/09/14 20:47	324
m,p-Xylene	340		260	32	ppb v/v			02/09/14 20:47	324
o-Xylene	98	J	130	17	ppb v/v			02/09/14 20:47	324

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130		02/09/14 20:47	324

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095153-001/CWL-D3-350

Lab Sample ID: 320-5780-25

Date Collected: 01/16/14 11:46

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		70 - 130		02/09/14 20:47	324
Toluene-d8 (Surr)	108		70 - 130		02/09/14 20:47	324

Client Sample ID: 095154-001/CWL-D3-440

Lab Sample ID: 320-5780-26

Date Collected: 01/16/14 12:00

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1400	J	1600	58	ppb v/v			02/09/14 21:37	328
Benzene	ND		130	26	ppb v/v			02/09/14 21:37	328
Benzyl chloride	ND		260	53	ppb v/v			02/09/14 21:37	328
Bromodichloromethane	ND		98	22	ppb v/v			02/09/14 21:37	328
Bromoform	ND		130	23	ppb v/v			02/09/14 21:37	328
Bromomethane	ND		260	110	ppb v/v			02/09/14 21:37	328
2-Butanone (MEK)	100	J	260	65	ppb v/v			02/09/14 21:37	328
Carbon disulfide	ND		260	26	ppb v/v			02/09/14 21:37	328
Carbon tetrachloride	30	J	260	21	ppb v/v			02/09/14 21:37	328
Chlorobenzene	ND		98	21	ppb v/v			02/09/14 21:37	328
Chloroethane	ND		260	100	ppb v/v			02/09/14 21:37	328
Chloroform	230		98	31	ppb v/v			02/09/14 21:37	328
Chloromethane	ND		260	65	ppb v/v			02/09/14 21:37	328
Dibromochloromethane	ND		130	26	ppb v/v			02/09/14 21:37	328
1,2-Dibromoethane (EDB)	ND		260	25	ppb v/v			02/09/14 21:37	328
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		130	51	ppb v/v			02/09/14 21:37	328
1,2-Dichlorobenzene	ND		130	43	ppb v/v			02/09/14 21:37	328
1,3-Dichlorobenzene	ND		130	36	ppb v/v			02/09/14 21:37	328
1,4-Dichlorobenzene	ND		130	49	ppb v/v			02/09/14 21:37	328
Dichlorodifluoromethane	ND		130	48	ppb v/v			02/09/14 21:37	328
1,1-Dichloroethane	ND		98	24	ppb v/v			02/09/14 21:37	328
1,2-Dichloroethane	97	J	260	29	ppb v/v			02/09/14 21:37	328
1,1-Dichloroethene	400		260	42	ppb v/v			02/09/14 21:37	328
cis-1,2-Dichloroethene	ND		130	29	ppb v/v			02/09/14 21:37	328
trans-1,2-Dichloroethene	ND		130	33	ppb v/v			02/09/14 21:37	328
1,2-Dichloropropane	190		130	79	ppb v/v			02/09/14 21:37	328
cis-1,3-Dichloropropene	ND		130	34	ppb v/v			02/09/14 21:37	328
trans-1,3-Dichloropropene	ND		130	29	ppb v/v			02/09/14 21:37	328
Ethylbenzene	97	J	130	21	ppb v/v			02/09/14 21:37	328
4-Ethyltoluene	ND		130	61	ppb v/v			02/09/14 21:37	328
Hexachlorobutadiene	ND		660	140	ppb v/v			02/09/14 21:37	328
2-Hexanone	ND		130	29	ppb v/v			02/09/14 21:37	328
4-Methyl-2-pentanone (MIBK)	ND		130	44	ppb v/v			02/09/14 21:37	328
Methylene Chloride	330		130	24	ppb v/v			02/09/14 21:37	328
Styrene	ND		130	19	ppb v/v			02/09/14 21:37	328
1,1,2,2-Tetrachloroethane	ND		130	23	ppb v/v			02/09/14 21:37	328
Tetrachloroethene	150		130	17	ppb v/v			02/09/14 21:37	328
Toluene	570		130	17	ppb v/v			02/09/14 21:37	328

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095154-001/CWL-D3-440

Lab Sample ID: 320-5780-26

Date Collected: 01/16/14 12:00

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloro-1,2,2-trifluoroethane	1300		130	53	ppb v/v			02/09/14 21:37	328
1,2,4-Trichlorobenzene	ND		660	140	ppb v/v			02/09/14 21:37	328
1,1,1-Trichloroethane	ND		98	21	ppb v/v			02/09/14 21:37	328
1,1,2-Trichloroethane	ND		130	22	ppb v/v			02/09/14 21:37	328
Trichloroethene	8200		130	34	ppb v/v			02/09/14 21:37	328
Trichlorofluoromethane	310		130	64	ppb v/v			02/09/14 21:37	328
1,2,4-Trimethylbenzene	ND		260	53	ppb v/v			02/09/14 21:37	328
1,3,5-Trimethylbenzene	ND		130	41	ppb v/v			02/09/14 21:37	328
Vinyl acetate	ND		260	48	ppb v/v			02/09/14 21:37	328
Vinyl chloride	ND		130	39	ppb v/v			02/09/14 21:37	328
m,p-Xylene	460		260	33	ppb v/v			02/09/14 21:37	328
o-Xylene	140		130	18	ppb v/v			02/09/14 21:37	328
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		70 - 130					02/09/14 21:37	328
1,2-Dichloroethane-d4 (Surr)	98		70 - 130					02/09/14 21:37	328
Toluene-d8 (Surr)	106		70 - 130					02/09/14 21:37	328

Client Sample ID: 095155-001/CWL-D3-480

Lab Sample ID: 320-5780-27

Date Collected: 01/16/14 11:51

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.4		5.0	0.18	ppb v/v			02/09/14 22:32	1
Benzene	0.15	J	0.40	0.079	ppb v/v			02/09/14 22:32	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/09/14 22:32	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/09/14 22:32	1
Bromoform	ND		0.40	0.070	ppb v/v			02/09/14 22:32	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/09/14 22:32	1
2-Butanone (MEK)	1.6		0.80	0.20	ppb v/v			02/09/14 22:32	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/09/14 22:32	1
Carbon tetrachloride	0.18	J	0.80	0.064	ppb v/v			02/09/14 22:32	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/09/14 22:32	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/09/14 22:32	1
Chloroform	1.4		0.30	0.095	ppb v/v			02/09/14 22:32	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/09/14 22:32	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/09/14 22:32	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/09/14 22:32	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/09/14 22:32	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/09/14 22:32	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/09/14 22:32	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/09/14 22:32	1
Dichlorodifluoromethane	0.57		0.40	0.15	ppb v/v			02/09/14 22:32	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/09/14 22:32	1
1,2-Dichloroethane	0.13	J	0.80	0.088	ppb v/v			02/09/14 22:32	1
1,1-Dichloroethene	1.5		0.80	0.13	ppb v/v			02/09/14 22:32	1

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095155-001/CWL-D3-480

Lab Sample ID: 320-5780-27

Date Collected: 01/16/14 11:51

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/09/14 22:32	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/09/14 22:32	1
1,2-Dichloropropane	0.68		0.40	0.24	ppb v/v			02/09/14 22:32	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/09/14 22:32	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/09/14 22:32	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/09/14 22:32	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/09/14 22:32	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/09/14 22:32	1
2-Hexanone	0.20	J	0.40	0.087	ppb v/v			02/09/14 22:32	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			02/09/14 22:32	1
Methylene Chloride	1.3		0.40	0.072	ppb v/v			02/09/14 22:32	1
Styrene	ND		0.40	0.059	ppb v/v			02/09/14 22:32	1
1,1,2,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/09/14 22:32	1
Tetrachloroethene	0.90		0.40	0.051	ppb v/v			02/09/14 22:32	1
Toluene	0.18	J	0.40	0.051	ppb v/v			02/09/14 22:32	1
1,1,2-Trichloro-1,2,2-trifluoroethane	4.2		0.40	0.16	ppb v/v			02/09/14 22:32	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/09/14 22:32	1
1,1,1-Trichloroethane	0.12	J	0.30	0.065	ppb v/v			02/09/14 22:32	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/09/14 22:32	1
Trichloroethene	35		0.40	0.11	ppb v/v			02/09/14 22:32	1
Trichlorofluoromethane	1.3		0.40	0.20	ppb v/v			02/09/14 22:32	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/09/14 22:32	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/09/14 22:32	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/09/14 22:32	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/09/14 22:32	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			02/09/14 22:32	1
o-Xylene	ND		0.40	0.054	ppb v/v			02/09/14 22:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		70 - 130					02/09/14 22:32	1
1,2-Dichloroethane-d4 (Surr)	98		70 - 130					02/09/14 22:32	1
Toluene-d8 (Surr)	105		70 - 130					02/09/14 22:32	1

Client Sample ID: 095156-001/CWL-D3-FB1

Lab Sample ID: 320-5780-28

Date Collected: 01/16/14 11:32

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	0.96	J	5.0	0.18	ppb v/v			02/09/14 23:26	1
Benzene	ND		0.40	0.079	ppb v/v			02/09/14 23:26	1
Benzyl chloride	ND		0.80	0.16	ppb v/v			02/09/14 23:26	1
Bromodichloromethane	ND		0.30	0.066	ppb v/v			02/09/14 23:26	1
Bromoform	ND		0.40	0.070	ppb v/v			02/09/14 23:26	1
Bromomethane	ND		0.80	0.34	ppb v/v			02/09/14 23:26	1
2-Butanone (MEK)	ND		0.80	0.20	ppb v/v			02/09/14 23:26	1
Carbon disulfide	ND		0.80	0.078	ppb v/v			02/09/14 23:26	1

TestAmerica Sacramento

Client Sample Results

Client: Sandia National Laboratories
Project/Site: CWL

TestAmerica Job ID: 320-5780-1

Client Sample ID: 095156-001/CWL-D3-FB1

Lab Sample ID: 320-5780-28

Date Collected: 01/16/14 11:32

Matrix: Air

Date Received: 01/22/14 09:15

Sample Container: Summa Canister 6L

Method: TO-15 - Volatile Organic Compounds in Ambient Air (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		0.80	0.064	ppb v/v			02/09/14 23:26	1
Chlorobenzene	ND		0.30	0.064	ppb v/v			02/09/14 23:26	1
Chloroethane	ND		0.80	0.31	ppb v/v			02/09/14 23:26	1
Chloroform	ND		0.30	0.095	ppb v/v			02/09/14 23:26	1
Chloromethane	ND		0.80	0.20	ppb v/v			02/09/14 23:26	1
Dibromochloromethane	ND		0.40	0.079	ppb v/v			02/09/14 23:26	1
1,2-Dibromoethane (EDB)	ND		0.80	0.075	ppb v/v			02/09/14 23:26	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		0.40	0.16	ppb v/v			02/09/14 23:26	1
1,2-Dichlorobenzene	ND		0.40	0.13	ppb v/v			02/09/14 23:26	1
1,3-Dichlorobenzene	ND		0.40	0.11	ppb v/v			02/09/14 23:26	1
1,4-Dichlorobenzene	ND		0.40	0.15	ppb v/v			02/09/14 23:26	1
Dichlorodifluoromethane	0.18	J	0.40	0.15	ppb v/v			02/09/14 23:26	1
1,1-Dichloroethane	ND		0.30	0.072	ppb v/v			02/09/14 23:26	1
1,2-Dichloroethane	ND		0.80	0.088	ppb v/v			02/09/14 23:26	1
1,1-Dichloroethene	ND		0.80	0.13	ppb v/v			02/09/14 23:26	1
cis-1,2-Dichloroethene	ND		0.40	0.089	ppb v/v			02/09/14 23:26	1
trans-1,2-Dichloroethene	ND		0.40	0.10	ppb v/v			02/09/14 23:26	1
1,2-Dichloropropane	ND		0.40	0.24	ppb v/v			02/09/14 23:26	1
cis-1,3-Dichloropropene	ND		0.40	0.10	ppb v/v			02/09/14 23:26	1
trans-1,3-Dichloropropene	ND		0.40	0.088	ppb v/v			02/09/14 23:26	1
Ethylbenzene	ND		0.40	0.063	ppb v/v			02/09/14 23:26	1
4-Ethyltoluene	ND		0.40	0.19	ppb v/v			02/09/14 23:26	1
Hexachlorobutadiene	ND		2.0	0.43	ppb v/v			02/09/14 23:26	1
2-Hexanone	ND		0.40	0.087	ppb v/v			02/09/14 23:26	1
4-Methyl-2-pentanone (MIBK)	ND		0.40	0.14	ppb v/v			02/09/14 23:26	1
Methylene Chloride	ND		0.40	0.072	ppb v/v			02/09/14 23:26	1
Styrene	ND		0.40	0.059	ppb v/v			02/09/14 23:26	1
1,1,1,2-Tetrachloroethane	ND		0.40	0.069	ppb v/v			02/09/14 23:26	1
Tetrachloroethene	ND		0.40	0.051	ppb v/v			02/09/14 23:26	1
Toluene	ND		0.40	0.051	ppb v/v			02/09/14 23:26	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.40	0.16	ppb v/v			02/09/14 23:26	1
1,2,4-Trichlorobenzene	ND		2.0	0.43	ppb v/v			02/09/14 23:26	1
1,1,1-Trichloroethane	ND		0.30	0.065	ppb v/v			02/09/14 23:26	1
1,1,2-Trichloroethane	ND		0.40	0.067	ppb v/v			02/09/14 23:26	1
Trichloroethene	ND		0.40	0.11	ppb v/v			02/09/14 23:26	1
Trichlorofluoromethane	ND		0.40	0.20	ppb v/v			02/09/14 23:26	1
1,2,4-Trimethylbenzene	ND		0.80	0.16	ppb v/v			02/09/14 23:26	1
1,3,5-Trimethylbenzene	ND		0.40	0.13	ppb v/v			02/09/14 23:26	1
Vinyl acetate	ND		0.80	0.15	ppb v/v			02/09/14 23:26	1
Vinyl chloride	ND		0.40	0.12	ppb v/v			02/09/14 23:26	1
m,p-Xylene	ND		0.80	0.10	ppb v/v			02/09/14 23:26	1
o-Xylene	ND		0.40	0.054	ppb v/v			02/09/14 23:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		70 - 130					02/09/14 23:26	1
1,2-Dichloroethane-d4 (Surr)	97		70 - 130					02/09/14 23:26	1
Toluene-d8 (Surr)	101		70 - 130					02/09/14 23:26	1

ANNEX C
Chemical Waste Landfill
CY 2014 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 3/3/14
2. Time of Inspection 1335
3. Name of Inspector Robert Zibek

<p>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: RZ <i>(Inspector must initial box before proceeding with the inspection.)</i> Training records maintained at CAMU Administrative Trailer.</p>

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Accumulation of wind-blown plants and debris.	yes	yes	2
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			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.			

**Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)**

NOTES

Note Number	Description
1.	<i>Wind blown tumbleweeds need to be</i>
	<i>removed from all drainage culverts</i>
	<i>on the south side of the site</i>
2.	<i>Wind blown tumbleweeds need to be</i>
	<i>removed from the site fence.</i>

**Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1. assigned to Don Schofield Date action completed 4/9/14
Mike Mitchell
Action (Note Number) 2. assigned to Don Schofield Date action completed 4/9/14
Mike Mitchell
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:

Action note numbers 1 & 2 were completed
by Segwia Landscaping on April 9, 2014
Dates that work was performed by Segwia
were April 7, 8, & 9.

Inspector's Signature [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 6/17/14
 2. Time of Inspection 0900-0959
 3. Name of Inspector Robert Zuck

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.)
 Training records maintained at CAMU Administrative Trailer.

RZ

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	yes	1

IV. PREVIOUS DEFICIENCIES			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	

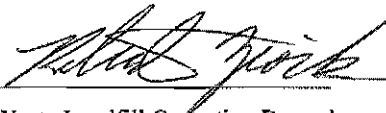
**Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1 assigned to Robert Zink Date action completed 6/17/14
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:

Action note #1 was completed at time of the
inspection

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 9/10/14
 2. Time of Inspection 0915 - 0950
 3. Name of Inspector Robert Zöck

<p>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: <i>(Inspector must initial box before proceeding with the inspection.)</i></p>	
<p>Training records maintained at CAMU Administrative Trailer.</p>	

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Accumulation of wind-blown plants and debris.	yes	yes	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	yes	2

IV. PREVIOUS DEFICIENCIES			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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
1	<i>All drainage culverts on south side of site had accumulation of wind-blown plants</i>
2	<i>The 2 western most survey monuments were not clearly visible due to dirt and weeds.</i>

Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)

Action (Note Number) 1 assigned to Robert Ziöck Date action completed 9/10/14

Action (Note Number) 2 assigned to Robert Ziöck Date action completed 9/10/14

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:

1. Accumulated wind-blown plants were removed from
all drainage culverts on the south side of the site
at time of the inspection, by Robert Ziöck

2. Weeds and dirt were removed from the two
western most survey monuments at time of
the inspection, by Robert Ziöck

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 12/9/14
 2. Time of Inspection 1410
 3. Name of Inspector 1445

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.)*

Training records maintained at CAMU Administrative Trailer.

1445

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. COVER SYSTEM [Quarterly]			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Channel or sidewall erosion in excess of 6 inches deep.	yes	No	
B. Channel sediment accumulation in excess of 6 inches deep.	yes	yes	1
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Accumulation of wind-blown plants and debris.	yes	yes	2
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			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
Uncorrected/undocumented previous deficiencies.	NA	NA	

**Chemical Waste Landfill
Post-Closure Inspection Form
Checklist for Cover System / Surface-Water / Security Fence (continued)**

Action (Note Number) 1 assigned to Robert Zock Date action completed 12/10/14

Action (Note Number) 2 assigned to Robert Zock Date action completed 12/9/14

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:

1. Robert Zock used a shovel to remove excess sediment accumulation from the culvert on the south west side of the site.

2. Wind-blown plants were removed from the site fence by Robert Zock as the inspection was being conducted.

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 Checklist for Groundwater Monitoring Locations / Sampling Equipment

1. Date of Inspection 01-09-14
2. Time of Inspection 0745
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]			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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 Soil-Gas Monitoring Locations / Sampling Equipment**

1. Date of Inspection 1/16/14
 2. Time of Inspection 0900
 3. Name of Inspector Robert Lynch

<p>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: <i>(Inspector must initial box before proceeding with the inspection.)</i></p> <p>Training records maintained at CAMU Administrative Trailer.</p>	RL
---	----

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. SOIL-GAS MONITORING LOCATIONS [Annually]			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Concrete pads, bollards, and protective casings in need of repair/maintenance.	YES	NO	
B. Well cover caps (e.g., PVC caps, J-Plug, Swagelok® dust caps, passive venting Baroballs™, or equivalent) in need of repair/maintenance.	YES	NO	
C. Well casing or sampling ports in need of repair/maintenance.	YES	NO	
D. Monitoring location and sampling ports properly labeled.	YES	NO	
E. Locks in need of cleaning or replacement.	NO	YES ^{1/16/14} NA	1

II. SAMPLING EQUIPMENT [Annually]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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

1. Date of Inspection 07/07/14
 2. Time of Inspection 0740
 3. Name of Inspector Robert Lynch

<p><u>Mandatory requirement:</u> The inspector has read the CWL Post-Closure Care Permit and activity-related procedures in the last 12 months, and completed all required training: RL (Inspector must initial box before proceeding with the inspection.) Training records maintained at CAMU Administrative Trailer.</p>

Provide explanatory notes for each parameter not inspected or each action required. Include any remedial steps required.

I. GROUNDWATER MONITORING LOCATIONS [Semi-annually]			
<i>Inspection Parameter</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
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	

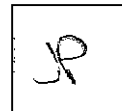
II. GROUNDWATER SAMPLING EQUIPMENT [Semi-annually]			
<i>Inspection Parameters</i>	<i>Parameter Inspected (Yes or No)</i>	<i>Action Required (Yes or No)</i>	<i>Note Number</i>
A. Sampling pump in need of repair/maintenance.	YES	NO	
B. Sampling assembly (e.g., tubing, gauges, and valves) in need of repair/maintenance.	YES	NO	

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.)



Approximate vegetative coverage (i.e., living plants): 44 %

Approximate percent native vegetation of the total vegetative cover: 98 %

Listed below are the main plant species identified growing on the CWL cover and the approximate percent cover for each species.

<u>Scientific Name</u>	<u>Common Name (optional)</u>	<u>%Total cover photosynthesizing</u>
<u>Bouteloua gracilis</u>	<u>Blue grama</u>	<u>15%</u>
<u>Bouteloua barbata</u>	<u>Six-weeks grama</u>	<u>1%</u>
<u>Salsola tragus</u>	<u>Russian thistle</u>	<u>trace*</u>
<u>Pleuraphis jamesii</u>	<u>Galleta grass</u>	<u>2%</u>
<u>Sporobolus cryptandrus</u>	<u>Sand dropseed</u>	<u>21%</u>
<u>Kallstroemia parviflora</u>	<u>Warty caltrop</u>	<u>trace</u>
<u>Panicum capillare</u>	<u>Witchgrass</u>	<u>trace</u>
<u>Sporobolus contractus</u>	<u>Spike dropseed</u>	<u>2%</u>
<u>Aristida adscensionis</u>	<u>Six-weeks three-awn</u>	<u>trace</u>
<u>Gutierrezia sarothrae</u>	<u>Broom snakeweed</u>	<u>trace</u>
<u>Amaranthus species</u>	<u>Pigweed</u>	<u>trace</u>
<u>Chamaesyce species</u>	<u>Spurge</u>	<u>trace</u>
<u>Dieteria canescens</u>	<u>Hoary tansyaster</u>	<u>trace</u>
<u>Atriplex canescens</u>	<u>Four-wing saltbush</u>	<u>trace</u>

*Note: "trace" means this species is present on the cover at a low level of less than 0.5% (one-half of a percent) of the total cover area.

Although "trace" species observed during the September 2014 annual inspection were present at levels less than 0.5%, they were relatively abundant, collectively totaling approximately 3% from 8 species.

Chemical Waste Landfill Biology Inspection Checklist for the CWL Cover (Continued)

Are there any contiguous areas of no vegetation greater than 200 square feet? (Approximately 14 x14 ft.): No

If "Yes," mark such areas on a map and attach to this checklist, and improve such area(s) with native vegetation via soil augmentation, scarification, and/or reseeded.

Are there any very deeply rooted (roots greater than 8 feet deep at maturity) plant species present on the cover? Yes

Notes: The CWL cover is in excellent shape. The cover is crowded with many green mature native, perennial clump grasses and many lesser-developed clump grasses.

TA3 received 4.97 inches of precipitation from January 2014-August 2014, with 3.5 inches of precipitation occurring in July and August. The CWL was sprinkler irrigated at the end of May and in the beginning of June in two events that each applied 0.5 inches of water.

Many juvenile four-wing saltbush are present across the cover. This shrub species can be deeply rooted at maturity, but the current individuals present on the cover have not yet developed deep root systems. Greatest mortality of four-wing saltbush is achieved by clipping during winter dormancy. The shrubs will be monitored and clipped sometime during the upcoming winter months as a best management practice (there is no requirement to remove potentially deep-rooted plants).

A very low level of weedy species are present on the cover. A weeding event was recently conducted on the cover.

Inspection for animal burrow intrusion into CWL cover

Are any burrows present on the cover? Yes

Does any burrow(s) appear to be active? Yes

Does any active burrow(s) appear to be that of a species that is able to burrow 6 feet deep or greater? No

If any of the active burrows appear to be that of a species that is able to burrow 6 feet or greater, mark such burrow(s) on a map and attach at the end of this checklist, and take appropriate actions as necessary to prevent damage to the cover.

Notes: Very small mammal burrows and ant burrows were observed on the cover. No map is attached because there are no burrows of a species that is able to burrow 6 feet deep or greater.

Biological Aspects Map – [note: no sketch map to locate specific features is attached – see notes above]

Survey Biologist Name: Jennifer Payne

Date: 9/2/2014

Original to: Chemical Waste Landfill Operating Record

ANNEX D
CY 2014 Chemical Waste Landfill Biology Report

2014 Chemical Waste Landfill Biology Report

Introduction

As required by the Chemical Waste Landfill (CWL) Post-Closure Care Permit (PCCP) (NMED October 2009), Attachment 1, Section 1.9.1.1, this summary report for Calendar Year (CY) 2014 presents the results of vegetation inspection and monitoring activities performed by the staff biologist on the CWL evapotranspirative (ET) Cover. The purpose of this report is to provide relevant background information, describe local climate trends over the 2014 growing season, expand on the inspection results, and provide recommendations for future ET Cover vegetation monitoring and maintenance. The annual CWL Biology Inspection of the CWL Cover (Biology Inspection) for CY 2014 was conducted on September 2, 2014. The inspection observations are documented in the "Chemical Waste Landfill Post-Closure Inspection Form Biology Inspection Checklist for the CWL Cover" (Annex C).

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, cold temperatures in the winter, drying winds in the spring, and infrequent precipitation. 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, permanent roots of perennial native grasses enable them to best withstand drought conditions, provide soil stabilization, and remove moisture from deeper soil layers of the ET Cover relative to non-native or annual species.

Background Information

The CWL ET Cover was unsuccessfully seeded in September 2005 after cover construction was completed. To meet the criteria for successful revegetation in the timeframe specified in the PCCP (i.e., within 5 years of the PCCP becoming effective), the CWL was weeded, reseeded, and supplemental watering was conducted for approximately two months during the end of the 2009 growing season. The September 2011 CWL Biology Inspection determined the ET Cover met 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 CWL Annual Post-Closure Care Report for CY 2011 (SNL/NM March 2012).

The September 2012 CWL Biology Inspection documented cover conditions that continued to meet the criteria for successful revegetation. Although very little of the grass was green and actively photosynthesizing at the time of the 2012 inspection due to lack of precipitation and soil moisture, the native blue grama grasses were determined to be dormant but alive. CWL cover vegetation during the 2012 and 2013 inspections was characterized by small and tightly spaced native juvenile clump grasses. The CY 2012

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Biology Report and Biology Inspection are included in the CWL Annual Post-Closure Care Report for CY 2012 (SNL/NM March 2013).

The September 2013 CWL Biology Inspection determined the CWL ET Cover continued to meet the criteria for successful revegetation. Blue grama was the dominant grass species, and along with other native grasses comprised the majority of the ET Cover vegetation. Many weedy species, including weedy grasses, were present that had not previously been documented on the cover. Although many juvenile native grass clumps were noted to have died since the 2012 inspection due to the prolonged drought, the open spaces created by their absence allowed for more resilient clumps to begin their development into bigger and more mature grasses. A greater diversity of native grasses was observed in 2013 than in 2012.

Local Climate Trends for 2014 Growing Season

Climate trends for north-central New Mexico are presented in this section as they have a significant impact on the cover vegetation. Since the reseeding effort in August 2009, the local climate has primarily been dominated by an ongoing drought with temperature extremes across the seasons. During the time since reseeding, 2013 has been the only year to receive above average annual precipitation. The last quarter of 2013 was unseasonably warm, followed by very dry winter and spring seasons in 2014. The 2014 summer monsoon season experienced slightly above average monsoonal rains during July and August, but had lower than average annual precipitation. Table 1 provides meteorological data for the 12-month period preceding and including the CY 2014 growing season.

Precipitation, Relative Humidity and Winds

Drought has been the dominant meteorological trend in the CWL area since 2008. Total annual precipitation for the 2014 growing season and preceding interval (October 2013-September 2014) was 7.17 inches. This is 20% below the 17-year annual precipitation average of 9 inches for this time period. Precipitation in 2013 and 2014 was greater than recent years, but as of September 30, 2014 the area was still in "Moderate Drought" according to the U.S. Drought Monitor (October 2014).

From October 2013-June 2014, the CWL received 2.56 inches of precipitation, approximately half the average of 4.89 inches for this timeframe. During the 2014 monsoon season (July-September), there was a total of 4.61 inches of precipitation, which is above the monsoon season average. From October-December 2014 an additional 2.08 inches of precipitation occurred, almost exactly the 19-year precipitation average for this quarter.

Relative humidity was close to average for the year. Relative humidity was prominently above normal by 12.2% in November 2013 and 9.1% in July 2014. The only notable low relative humidity month was March 2014 at 10.5% below normal. Winds were average for the year; January 2014 varied most greatly from its monthly average with winds 1.0 mile per hour or 14.5% above normal.

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Table 1
Summary of 2014 Growing Season Meteorological Data at the CWL^a

Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Year	2013	2013	2013	2014	2014	2014	2014	2014	2014	2014	2014	2014	
Temperature (°F)													Annual
Monthly Mean	66.60	53.68	44.07	39.30	45.55	49.00	55.48	63.88	77.66	76.09	72.30	69.44	59.42
17-year Temp Means	57.66	46.42	37.03	37.77	41.80	48.49	55.52	66.22	74.82	76.80	74.84	68.84	57.18
Precipitation (Inches)													
Monthly Total	0.16	0.82	0.71	0.00	0.08	0.30	0.14	0.30	0.05	2.07	2.25	0.29	7.17
19-year Precip Means	1.04	0.45	0.54	0.35	0.48	0.60	0.51	0.40	0.52	1.41	1.79	0.90	9.00
Relative Humidity (%)													
Monthly Mean	37.2	56.9	57.4	47.0	40.7	27.1	23.8	20.4	19.3	49.4	44.2	49.7	39.4
17-year RH Means	43.8	44.7	53.4	51.2	45.2	37.6	31.0	26.7	26.0	40.3	44.9	42.1	40.6
Wind (Miles/hour)													
Monthly Mean	8.42	7.45	6.11	7.92	7.39	9.07	10.54	9.58	10.00	9.04	7.50	8.39	8.45
17-year Wind Means	7.82	7.11	6.84	6.92	8.03	9.08	10.60	9.88	9.74	8.39	7.93	8.00	8.36

^aInformation Source: SNL/NM Meteorological Monitoring Program.

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Temperature

The CWL experienced ninety-one degrees of temperature variability, with a low of 6.28°F in December and a high of 97.75°F in June. Although 2014 did not experience any 100°F temperatures, overall temperatures were 2.24°F, or 4%, above normal for the year. Heat stress to plants was not as great during the 2014 growing season as it often is, due to lower maximum temperatures. Temperatures were significantly above normal by 7°-9°F from October-December 2013, followed by slightly above average temperatures for the remainder of the winter and early spring. Significantly above-normal wintertime temperatures can cause plant stress due to reduced dormancy and less plant energy available for root growth.

Cover Development and Maintenance

The successional development of the native grasses on the CWL ET Cover was significant in 2013 and continued in 2014. Less robust individual native grass clumps died in 2013, creating barren interspaces for the remaining, more resilient grass clumps to expand their root systems and grow. This succession process involved a major die-off of the juvenile clump grasses due to stress associated with the prolonged drought as outlined in the previous section. In 2013 native vegetation development on the CWL ET Cover was assisted by weeding, applying additional native seed, and supplemental watering. The September 2013 CWL Biology Inspection determined the CWL ET Cover to have approximately 38% coverage with approximately 90% native vegetation composition.

Maintenance activities performed on the CWL ET Cover in 2014 are summarized below and in Section 6.1.2 of the 2014 CWL Annual Post-Closure Care Report.

April: Dead weedy vegetation was removed from the CWL ET Cover, perimeter fence line, and surrounding perimeter area. This maintenance activity primarily removed loose tumbleweeds that had grown on the ET Cover or had blown into the area and accumulated near the fence lines.

May-Early June: Live and dead weedy vegetation was removed from the CWL ET Cover. A ½-inch supplemental watering event occurred in late May.

June: A ½-inch supplemental watering event was performed in early June.

July: During the July 2014 groundwater monitoring event and well/equipment inspection, a small burrow was observed just inside the fence line on the western perimeter, near monitoring well CWL-MW11. The shallow burrow was determined to be inactive (i.e., abandoned) and was backfilled with adjacent soil.

August: Live and dead weedy vegetation was removed from the CWL ET Cover, perimeter fence line, and surrounding perimeter area. The herbicide Strike 3® from Winfield Solutions was applied to the western perimeter area between the fence line and the road to prevent additional weed growth.

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October: Live and dead weedy vegetation was removed from the CWL ET Cover, perimeter fence line, and surrounding perimeter area. A 1-inch supplemental watering event was performed in mid-October.

September 2014 Inspection Results

The September biology inspection determined the CWL ET Cover to have approximately 44% coverage, approximately 98% of which is native vegetation (Figure 1). Sand dropseed was the dominant grass species, and along with other native grasses comprised the majority of the ET Cover vegetation. The ET Cover was crowded with many green, nearly fully-mature native perennial clump grasses as well as some juvenile native grasses. Very low levels of weedy species were present on the cover at the time of the inspection.

The native grass coverage at the northwest corner of the ET Cover improved significantly from previous years (Figure 1). Many of the clump grasses in this area are in a moderately juvenile stage of development. This is the only access point to the ET Cover so sparser coverage in this area is anticipated and not of concern from an ET Cover performance standpoint.

The percent foliar coverage of the various native grass species varied slightly from previous years. As the cover changes into a mature plant community, the native species composition will likely continue to gradually change.

Precipitation greatly assisted the growth of native vegetation on the ET Cover in 2014. In September of 2013 the cover received 4.12 inches of rain and four ½-inch supplemental watering events, followed by 0.16 inches of rain and one additional ½-inch watering event in October. These autumn 2013 wetting events provided deeper, near-surface soil moisture for prime root growth during the cooler seasons. Pre-winter moisture is very beneficial for development into mature native bunchgrasses. This was particularly important in autumn 2013 as only approximately half the normal amount of precipitation occurred during this fall, winter and spring timeframe.

The 2014 summer monsoons provided excellent precipitation, 6% above normal. This warm-season moisture facilitated growth of established native vegetation across the CWL ET Cover.

Recommendations

Weeding events will likely need to be conducted in 2015 to reduce competing weeds to a level that is consistent with the natural surroundings. This will also assist establishment of mature native perennial grasses in the open spaces on the CWL ET Cover.

Late spring supplemental watering may be needed if adequate winter precipitation is not received. Supplemental watering may also be needed in the autumn of 2015 if the monsoon rains and previous 12-month precipitation are below normal.

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Southwest portion of the cover



Northwest portion of the cover



Southeast portion of the cover



Northeast portion of the cover

Figure 1 September 2, 2014 CWL ET Cover Photos

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Monitoring of the northwest corner will continue and, to the extent possible, traffic through this access point will be minimized. Sparse coverage in this area is anticipated, and as long as it is limited to the immediate vicinity of the entrance it will not have an adverse impact on ET Cover performance. The CWL ET Cover will continue to be inspected annually as required under the PCCP.

References

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