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FINAL

RCRA Facility Investigation Report RAAP-047

Buildings 1549, 1041 and 1034

Prepared for:
Radford Army Ammunition Plant

September 2009

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

received
11-6-09
09-140

October 23, 2009

Commander,
Radford Army Ammunition Plant
Attn: SJMRF-OP-EQ (Jim McKenna)
P.O. Box 2
Radford, VA 24141-0099

P.W. Holt
Environmental Manager
Alliant Techsystems, Inc.
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24141-0100

Re: Radford Army Ammunition Plant, Va.
Review of Army's Final RCRA Facility Investigation (RFI) Report for
RAAP-047

Dear Mr. McKenna and Ms. Holt:

The U.S. Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (VDEQ) have reviewed the U.S. Army's (Army's) September 2009 Final RFI Report for RAAP-047, located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. Based upon our review, the report is approved, and in accordance with Part II. (E) (5) of RFAAP's Corrective Action Permit, it can now be considered final.

If you have any questions, please call me at 215-814-3413. Thanks.

Sincerely,

William Geiger
RCRA Project Manager
Office of Remediation (3LC20)

cc: James Cutler, VDEQ

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Radford, VA 24143-0100

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September 24, 2009

Mr. William Geiger
RCRA General Operations Branch, Mail Code: 3WC23
Waste and Chemicals Management Division
U. S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Mr. James L. Cutler, Jr.
Virginia Department of Environmental Quality
629 East Main Street
Richmond, VA 24143-0100

Subject: With Certification, RCRA Facility Investigation Report RAAP-047, Buildings, 1549, 1041 and 1034, Final September 2009
EPA ID# VA1 210020730

Dear Mr. Geiger and Mr. Cutler:

Enclosed is the certification for the subject document that was sent to you on September 23, 2009. Also enclosed is the 23 September 2009 transmittal email with its attached response to comments.

This document was revised per the response to comments and we anticipate approval.

Please coordinate with and provide any questions or comments to myself at (540) 639-8658, Jerry Redder ATK staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,

P.W. Holt, Environmental Manager
Alliant Techsystems Inc.

c: Karen Sismour
Virginia Department of Environmental Quality
P. O. Box 10009
Richmond, VA 23240-0009

E. A. Lohman
Virginia Department of Environmental Quality
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019

09-815-157
JMcKenna

Rich Mendoza
U.S. Army Environmental Command
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Tom Meyer
Corps of Engineers, Baltimore District
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JMcKenna

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J. J. Redder
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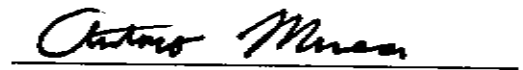
Coordination: J. McKenna M. A. Miano

09-815-157
JMcKenna

Concerning the following:

Radford Army Ammunition Plant
RCRA Facility Investigation
RAAP-047 Buildings 1549, 1041 and 1034
Final September 2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure 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 fines and imprisonment for knowing violations.

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PRINTED NAME: Antonio Munera
TITLE: LTC, CM
Commanding

SIGNATURE: 
PRINTED NAME: Kent Holiday
TITLE: Vice President and General Manager
ATK Energetics Systems

09-815-157
JMcKenna

Greene, Anne

From: McKenna, Jim
Sent: Wednesday, September 23, 2009 1:14 PM
To: Greene, Anne; ealohman@deq.virginia.gov; Druck, Dennis E Mr CIV USA MEDCOM CHPPM; diane.wisbeck@arcadis-us.com; durwood willis2; Geiger.William@epamail.epa.gov; Redder, Jerome; jim spencer; jlcutler@deq.virginia.gov; kjsismour@deq.virginia.gov; Llewellyn, Tim; Mendoza, Richard R Mr CIV USA IMCOM; Meyer, Tom NAB02; Parks, Jeffrey N; Timothy.Leahy@shawgrp.com; Tina_Devine@URSCorp.com
Subject: RAAP-047, Buildings 154f9, 1041 and 1034 RFI Reportk final Radford Tracking Numbers (UNCLASSIFIED)
Attachments: RAAP047 RTC_Geiger.pdf

Importance: High

Classification: UNCLASSIFIED
Caveats: FOUO

All:

Note the contractor will ship the subject document with a copy of this email to the POCs and tracking numbers below. Also attached is a summary of comments received and responses to comments.

A certification letter will follow.

Thank you for your support of the Radford Army Ammunition Plant Installation Restoration Program.

Jim McKenna

Mr. Richard Mendoza	796967900575
Ms. Susan Ryan	796967907640
Mr. Tom Meyer	797955646424
Mr. Dennis Druck	796967916118
Mr. James Cutler	797955654650
Ms. Karen Sismour	797955663736
Ms. Elizabeth Lohman	797955667720
Mr. William Geiger	797955672259

Classification: UNCLASSIFIED
Caveats: FOUO

Comments and Responses on the Draft RAAP-047: RFI Report

Radford Army Ammunition Plant
June 2009

Item No.	Report Reference	COMMENT	RESPONSE
Radford: William Geiger			
1.	General	The conclusions should include references to the ASD; the fact that additional downgradient investigations served to provide evidence that the source of the TCE was in fact HWMU 5, and that there is no downgradient evidence of TCE migrating from any potential upgradient source.	*Agreed. The following text was included in both the Executive Summary and the Section 6.0 Conclusions:* No potential ongoing sources were indentified and the hypothesis that one or more of the buildings is (or was formerly) a source of chlorinated VOCs to groundwater is not supported by the data. It was concluded using data gathered during this investigation and additional downgradient investigations that the source of the TCE in groundwater was HWMU 5, and that there is no evidence of TCE migrating from any potential upgradient source, specifically the buildings investigated under this RFI.
2.	General	Also, more discussion of the downgradient investigation should be included in the body of the report. This would include supporting GW data collected along the transects designed to intercept preferential migration pathways due to local geologic controls (karst fracturing, etc.)	*Noted. A summary of the results of the downgradient investigation were added to Section 3.4, Summary of Results.*
3.	General	EPA/VDEQ concur that no further action is required for these sites, but this is based more on a "screening for TCE" perspective rather than a complete RFI characterization. Note that GW risk was not carried forward for metals, for example.	In July 2009 additional groundwater samples were collected and analyzed for total and dissolved metals. Analytical results for both total and dissolved metals are presented in the RFI Report and the HHRA was revised to assess potential risks associated with use of the groundwater as a potable water supply under both future industrial and future hypothetical residential land uses. The inclusion of these data in the RFI and HHRA provide a complete RFI characterization.

RE Final RAAP-047 RFI Report for Army Review (UNCLASSIFIED).txt

From: Druck, Dennis E Mr CIV USA MEDCOM CHPPM [dennis.druck@us.army.mil]
Sent: Thursday, September 10, 2009 8:09 AM
To: McKenna, Jim J Mr CIV USA AMC
Cc: Druck, Dennis E Mr CIV USA MEDCOM CHPPM
Subject: RE: Final RAAP-047 RFI Report for Army Review (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Jim, I reviewed the risk assessment with the addition of the GW samples and it looked OK to me. Dennis

-----Original Message-----
From: McKenna, Jim J Mr CIV USA AMC [mailto:jim.mckenna@us.army.mil]
Sent: Wednesday, September 09, 2009 2:27 PM
To: Druck, Dennis E Mr CIV USA MEDCOM CHPPM
Subject: FW: Final RAAP-047 RFI Report for Army Review (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Classification: UNCLASSIFIED
Caveats: FOUO

Classification: UNCLASSIFIED
Caveats: FOUO

Hi Dennis,

Can you review the attached before we resubmit to the EPA and DEQ?
Since your last review we had to respond to regulatory comments by collecting groundwater samples for metals and adding to the risk assessment. Trying to avoid resubmitting something that we think may be final but needs corrections.

Thanks,
Jim

-----Original Message-----
From: Wisbeck, Diane [mailto:Diane.Wisbeck@arcadis-us.com]
Sent: Wednesday, September 09, 2009 1:04 PM
To: McKenna, Jim J Mr CIV USA AMC
Subject: Final RAAP-047 RFI Report for Army Review

Jim,

Attached for your review is the Final RFI Report for RAAP-047.
Revisions to the document are highlighted in red-line strike out to facilitate your review. The Draft RFI Report was revised to address EPA comments and include the additional groundwater samples that were collected in July.
Lastly, the HHRA was revised to incorporate the assessment of the groundwater.
Also attached are revised figures, tables, and the Response to Comment document.

Please forward to those you feel appropriate to review this document.
As we discussed, the Army has reviewed this report twice before.

Warmest Regards,

Diane D. Wisbeck | Certified Project Manager | mailto:diane.wisbeck@arcadis-us.com
<blockedmailto:diane.wisbeck@arcadis-us.com>

ARCADIS U.S., Inc. | 1114 Benfield Blvd, Suite A | Millersville, MD, 21108 O. 410.987.0032 | T. 410.923.7834 | M. 443.909.9059 | F. 410.987.4392 www.arcadis-us.com <blockedhttp://www.arcadis-us.com/>

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Classification: UNCLASSIFIED
Caveats: FOUO

RAAP-47 RFI Comments

From: Geiger.William@epamail.epa.gov
Sent: Monday, June 15, 2009 1:34 PM
To: McKenna, Jim J Mr CIV USA AMC
Cc: Wisbeck, Diane; jim spencer; Parks, Jeffrey N; jeremy.flint@atk.com; jerome.redder@atk.com; jlcutler@deq.virginia.gov; Mendoza, Richard R Mr CIV USA IMCOM; Timothy.Leahy@shawgrp.com; Llewellyn, Tim; Tina_Devine@URSCorp.com; Meyer, Tom NAB02
Subject: RAAP-47 RFI Comments

The conclusions should include references to the ASD; the fact that additional downgradient investigations served to provide evidence that the source of the TCE was in fact HWMU 5, and that there is no downgradient evidence of TCE migrating from any potential upgradient source.

Also, more discussion of the downgradient investigation should be included in the body of the report. This would include supporting GW data collected along the transects designed to intercept preferential migration pathways due to local geologic controls (karst fracturing, etc.)

EPA/VDEQ concur that no further action is required for these sites, but this is based more on a “screening for TCE” perspective rather than a complete RFI characterization. Note that GW risk was not carried forward for metals, for example.

William A. Geiger
Office of Remediation (3LC20)
USEPA Region III
1650 Arch Street
Philadelphia, PA 19103
(215)814-3413

DEPARTMENT OF THE ARMY
US ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
5158 BLACKHAWK ROAD
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MCHB-TS-REH

8 MAY 2009

MEMORANDUM FOR Office of Environmental Quality, Radford Army Ammunition Plant (SJMRF-OP-EQ/Mr. Jim McKenna), P.O. Box 2, Radford, VA 24143-0002

SUBJECT: Document Titled: "Draft RCRA Facility Investigation Report for RAAP-047, Radford Army Ammunition Plant, Virginia, April 2009"

1. The US Army Center for Health Promotion and Preventive Medicine reviewed the subject document on behalf of the Office of The Surgeon General pursuant to Army Regulation 200-1 (Environmental Protection and Enhancement). We appreciate the opportunity to review this report and concur with the recommendation of clean closure with no further action as being protective of human health and the environment.

2. Our previous comments have been addressed and we only have two additional minor comments. There is a discrepancy for the depth of the surface soil samples for buildings 1034 and 1549. In section 2, the depth is given as 0.5 to 1.5 feet whereas in section 3, the depth is 0 to 1.5 feet. Also, Tables 5-14, 5-15, and 5-16 show the Hazard Indices (HIs) exceeding unity for the hypothetical child resident. In addition to the footnote, these tables should either present the individual HIs when segregated by critical effect/target organ or reference the appropriate tables in Appendix E.

3. The document was reviewed by Mr. Dennis Druck, Environmental Health Risk Assessment Program. He can be reached at DSN 584-2953, commercial (410) 436-2953 or electronic mail "dennis.druck@us.army.mil".

FOR THE COMMANDER:

JEFFREY S. KIRKPATRICK
Director, Health Risk Management

CF:
HQDA (DASG-PPM-NC)
IMCOM-NE (IMNE-PWD-E)
USACE (CEHNC-CX-ES)
USAEC (IMAE-CD/Mr. Rich Mendoza)

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April 30, 2009

Mr. William Geiger
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Waste and Chemicals Management Division
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1650 Arch Street
Philadelphia, PA 19103-2029

Mr. James L. Cutler, Jr.
Virginia Department of Environmental Quality
629 East Main Street
Richmond, VA 24143-0100

Subject: With Certification, Draft RCRA Facility Investigation Report, RAAP-047 Buildings 1549, 1041 and 1034, April 2009
EPA ID# VA1 210020730

Dear Mr. Geiger and Mr. Cutler:

Enclosed is the certification for the subject document that was sent to you on April 21, 2009. Also enclosed is the 21 April 2009 transmittal email.

Please coordinate with and provide any questions or comments to myself at (540) 639-8658, Jerry Redder ATK staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,

P.W. Holt, Environmental Manager
Alliant Techsystems Inc.

c: Karen Sismour
Virginia Department of Environmental Quality
P. O. Box 10009
Richmond, VA 23240-0009

E. A. Lohman
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09-815-72
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Coordination: J. McKenna M. A. Miano

bc: Administrative File
J. McKenna, ACO Staff
Rob Davie-ACO Staff
M.A. Miano
P.W. Holt
J. J. Redder
Env. File

09-815-72
JMcKenna

Concerning the following:

Radford Army Ammunition Plant
Draft RCRA Facility Investigation Report
RAAP-047 Buildings 1549, 1041 and 1034
April 2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure 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 fines and imprisonment for knowing violations.

SIGNATURE: _____
PRINTED NAME: Jon R. Drushal
TITLE: Colonel, US Army
Commanding

SIGNATURE: _____
PRINTED NAME: Kent Holiday
TITLE: Vice President and General Manager
ATK Energetics Systems

09-815-72
JMcKenna

Greene, Anne

From: McKenna, Jim
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Subject: Draft RFI Report for RAAP-047 for Bldgs 1549, 1041, 1034 Submittal (UNCLASSIFIED)

Importance: High

Classification: UNCLASSIFIED
Caveats: FOUO

All:

Note the contractor will ship the subject document with a copy of this email to the POCs and tracking numbers below.

A certification letter will follow.

Thank you for your support of the Radford Army Ammunition Plant Installation Restoration Program.

Jim McKenna

POCs and tracking numbers:

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Mr. Richard Mendoza	796536353528
Mr. Tom Meyer	797524350072
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Ms. Susan Ryan	796536485272
Mr. William Geiger	796536585632
Mr. James Cutler	796536564770
Ms. Karen Sismour	796536569750
Mr. Dennis Druck	797524354321

Classification: UNCLASSIFIED
Caveats: FOUO

FINAL

RCRA Facility Investigation Report
RAAP-047

Buildings 1549, 1041 and 1034

Radford Army Ammunition Plant

September 2009



Christopher Sharpe
Senior Scientist



Diane Wisbeck
Assistant Project Manager



Tim Llewellyn
Project Manager

RCRA Facility Investigation Report RAAP-047

Buildings 1549, 1041 and 1034

Radford Army Ammunition Plant

Prepared for:
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Our Ref.:
GP08RAAP.0047

Date:
September 2009

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List of Acronyms and Abbreviations

AEC	Army Environmental Command
ARCADIS	ARCADIS U.S., Inc.
ASD	Alternate Source Demonstration
bgs	below ground surface
COPCs	Constituents of Potential Concern
CSM	conceptual site model
CSF	cancer slope factor
DAF	dilution attenuation factor
ELCR	excess lifetime cancer risk
EPC	exposure point concentration
FID	Flame- ionization
HEAST	Health Effects Assessment Summary Tables
HI	Hazard Index
HQ	Hazard Quotient
HHRA	Human Health Risk Assessment
HWMU	Hazard Waste Management Unit
IRP	Installation Restoration Program
MCLs	Maximum Contaminant Levels
MMA	Main Manufacturing Area
MQAP	Master Quaility Assurance Plan
NOAEL	no observed adverse effect level
NRU	New River Unit
PBC	Performance Based Contract
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PID	Photo-ionization detector
QA/QC	Quality assurance/quality control

List of Acronyms and Abbreviations Continued

QAPA	Quality Assurance Plan Addendum
RCRA	Resource Conservation and Recovery Act
RFAAP	Radford Army Ammunition Plant
RfD	reference dose
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
SOPs	standard operating procedures
SSL	Soil Screening Levels
SWMU	Solid Waste Management Unit
SVOCs	semivolatile organic compounds
TCE	trichloroethylene
UCL	Upper Confidence Limit
USEPA	U.S. Environmental Protection Agency
UTL	Upper Tolerance Level
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound

Executive Summary

ARCADIS U.S, Inc. (ARCADIS) has been retained by the United States Army Environmental Command to perform Installation Restoration Program activities at Radford Army Ammunition Plant (RFAAP), located in Radford Virginia. This document is the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for RAAP-047, which includes Buildings 1034, 1041, and 1549. The RFI was initiated as a result of groundwater investigations completed at Hazardous Waste Management Unit (HWMU) 5, a closed surface impoundment located north of the three buildings. Investigations at HWMU-5 identified persistent, low-level concentrations of trichloroethene (TCE) in shallow overburden groundwater northeast of the HWMU. The Draft Alternate Source Demonstration (ASD) for Trichloroethene (Draper Aden, 2007) identified Buildings 1034, 1041 and 1549 as potential alternate sources of the TCE based on their upgradient locations and documented historical solvent use. The purpose of this investigation was to evaluate potential effects to soil, soil gas or groundwater associated with potential historical solvent use in Buildings 1034, 1041, and 1549 and to assess the environmental conditions of these sites comprehensively.

The RFI was completed in three phases of field work completed between May 2008 and July 2009. During Phase 1 soil, soil gas and grab groundwater samples were collected around the perimeter of each building, targeting potential release pathways, such as doorways, as describe in Work Plan Addendum 25 (ARCADIS, 2008c). Additionally, subslab soil gas samples were collected beneath each building. Soil and groundwater samples were collected during Phase 2 to delineate constituents detected in samples collected during Phase 1. Phase 2 also included vertical-aquifer profile borings on a transect downgradient of Building 1041. Groundwater samples collected during Phase 1 and 2 were grab samples from temporary points. Groundwater samples were turbid resulting in unrepresentative levels of metals in the groundwater. During Phase 3 additional temporary well points were installed near Buildings 1041 and 1549 and filtered and unfiltered groundwater samples were collected and analyzed for metals to evaluate the concentrations of metals in the dissolved phase.

During the first phase of investigation, TCE was detected in one soil-gas sample collected at Building 1041 (sample 1041-3). This detection was delineated with six soil samples, and with groundwater samples collected at a downgradient transect of Vertical Aquifer Profiling borings. No site-related volatile organic compounds (VOCs) were detected in either soil or groundwater samples at concentrations greater than the industrial Regional Screening Levels (RSLs). During Phase 1, Aroclor 1254 was detected in one soil sample, collected on the south side of Building 1041, at a level

greater than the protection of groundwater screening level. However no Aroclors were detected in the delineation samples, indicating a limited area of extent.

No potential ongoing sources were indentified and the hypothesis that one or more of the buildings is (or was formerly) a source of chlorinated VOCs to groundwater is not supported by the data. It was concluded using data gathered during this investigation and additional downgradient investigations that the source of the TCE in groundwater was HWMU 5, and that there is no evidence of TCE migrating from any potential upgradient source, specifically the buildings investigated under this RFI.

A risk assessment was conducted to evaluate current and future exposure to groundwater, soil and soil gas under current/future industrial and hypothetical future residential land-use scenarios. While groundwater is not currently used as a potable water source and it not expected to be used for this purpose in the future, the risk assessment conservatively included this exposure pathway. Results of the risk analysis for groundwater indicated elevated risks and hazards due primarily to the arsenic concentration detected in one groundwater sample. However, because this sample was visibly turbid even after filtering and the other filtered samples analyzed were non-detect for arsenic, it is believed that this elevation in concentration is due to local geology and is not representative of dissolved phase conditions at the site. With the exception of potential risks associated with one groundwater sample, potential risks and hazards for industrial and residential exposures were within USEPA's generally acceptable risk range. Therefore, clean closure with no further action is recommended for Buildings 1034, 1041 and 1549.

1.0 Introduction

ARCADIS U.S, Inc. (ARCADIS) has prepared this Radford Army Ammunition Plant (RFAAP) RFI Report on behalf of the United States Army Environmental Command (AEC) to perform Installation Restoration Program (IRP) activities at RFAAP, located in Radford Virginia. This work was conducted under a Performance Based Contract (PBC) encompassing the New River Unit (NRU), two Solid Waste Management Units (SWMUs), and one Hazardous Waste Management Unit (HWMU) currently under RCRA Part II Permit.

This RFI was conducted for the area identified as RAAP-047, which includes Buildings 1034, 1041, and 1549 as locations where historical chlorinated solvent use has occurred (**Figure 1**). This work was done in accordance with applicable sections of the Master Work Plan (URS, 2003), Standard Operating Procedures (SOPs) and Addendum 25 to the Master Work Plan (ARCADIS, 2008c).

1.1 Purpose and Objectives

The purpose of this investigation was to evaluate potential effects to soil, soil gas and groundwater associated with potential historical solvent use in Buildings 1034, 1041, and 1549, and to assess the environmental conditions of these sites comprehensively. The RFI was initiated as a result of groundwater investigations completed at HWMU-5, a closed surface impoundment located north of the three buildings (**Figure 2**). Investigations at HWMU-5 identified persistent, low-level concentrations of trichloroethene (TCE) in shallow overburden groundwater northeast of the HWMU. The Draft Alternate Source Demonstration for Trichloroethene (Draper Aden, 2007) identified Buildings 1034, 1041 and 1549 as potential alternate sources of the TCE, based on their upgradient locations and documented historical solvent use. The primary objective of the RAAP-047 RFI was to determine whether or not one or more of the subject buildings was a potential source of TCE or other constituents. The secondary objective was to complete comprehensive RFIs at each of the buildings.

1.2 Site Location and Description

The RFAAP is located in the New River Valley in southwest Virginia. The installation is composed of two discrete properties, the NRU and the Main Manufacturing Area (MMA), which are located about 6 miles apart. RAAP-047 is located in the MMA, an active ammunition production facility that straddles the Pulaski County and Montgomery County line, approximately 5 miles west of Blacksburg, Virginia. The New

River flows through the MMA, dividing the installation into two parts: the Horseshoe Area, and the South Bank Area (**Figure 1**). RAAP-047 is located within the South Bank Area, within an active industrial portion of the plant.

This RFI evaluated three buildings, as follows:

- **Building 1034.** A 10,000 ft^2 former nitrocellulose laboratory, now an electrical and refrigeration shop.

- **Building 1041.** A 1,200 ft^2 former degreasing shop, now a scale maintenance and cleaning shop.

- **Building 1549.** A 2,400 ft^2 area maintenance shop.

The building locations are shown in **Figure 2**. Each building is constructed of cinder-blocks with typical slab-on-grade construction. Building 1034 is constructed on sloping ground and has a newer, two story addition at the north end. The newer portion is set into the hill such that the upper level is on grade with the older (southern) portion of the building. The remaining buildings are single story.

1.3 Building History

Each of the buildings was originally constructed in the 1940s, during general construction of the MMA. The buildings are believed to have been in continuous use through present day. The three buildings included in RAAP-047 were identified in the Draft ASD as potential sources of TCE based on historical solvent use. Although there was no documented use of TCE at these buildings, the basis for their selection was as follows:

- **Building 1034.** Records indicated that DuPont Cleaning Solvent # 49, which contains tetrachloroethene (PCE), was used in electric motor cleaning at the building.

- **Building 1041.** The building formerly contained a solvent dip tank, and may have drained via a terracotta pipe to an underground storage tank.

- **Building 1549.** Employee interviews suggested that in the past, spent solvents had been disposed of in floor drains.

The documentation provided by the US Army (Draper Aden, 2007) in support of the building selections is included in Appendix A of this report.

1.4 Conceptual Site Model

The three buildings of RAAP-047 are located on north sloping ground within the South Bank Area of the MMA (**Figure 1**). The nearest perennial surface water feature is Stroubles Creek, located approximately 2000 feet to the west, which flows north to the New River. At its closest point to RAAP-47, the New River is approximately 3100 feet to the north of Building 1549.

The area encompassed by RAAP-047 is underlain by unconsolidated materials that range in depth from approximately 20 to 50 feet below ground surface (bgs). The geologic setting is conceptually illustrated on **Figure 3**. The unconsolidated materials consist of alluvial terrace deposits overlying residuum. The alluvial terrace deposits consist predominantly of clay and silt, with sporadic basal deposits of river jack (rounded cobbles embedded in a fine-grained matrix). The residuum consists of the insoluble weathering products of the underlying dolomite, predominantly interbedded silt, fine sand, and clay. At Buildings 1041 and 1034, the residuum has been characterized as saprolite, exhibiting a distinct bedrock fabric, yet decomposed to stiff clay and silt. Beneath the unconsolidated materials lies competent dolomite of the Elbrook Formation.

The water table ranges between 14 feet bgs, near Building 1549, and 17 feet bgs, in the vicinity of Building 1041. Three borings completed around the perimeter of Building 1034 did not encounter permeable saturated zones at depths of 22 to 36 feet. The apparent discontinuity of the water table between Buildings 1041 and 1034 is attributed to relief in the bedrock surface, in particular, an apparent zone of shallow rock occurring beneath building 1034 (**Figure 4**). There was no evidence of groundwater in this rock to the depth investigated. Groundwater flow in the area flows generally toward the northeast, as determined by the HWMU-5 groundwater monitoring program (Draper Allen, 2008). Local discontinuities and variation from the overall trend are expected to result from relief in the bedrock surface which physically separates zones of saturation in the unconsolidated materials.

2.0 Investigation Activities

Investigational activities were conducted in accordance with the requirements of Virginia Department of Environmental Quality (VDEQ) and United States Environmental Protection Agency (USEPA). This section presents a description of the RFI activities conducted in May and July of 2008.

2.1 Scope of Work

The RFI was conducted in three phases of field work completed between May 2008 and July 2009:

- Phase 1 was a multimedia screening evaluation. Soil, soil gas and grab groundwater samples were collected around the perimeter of each building using a direct-push drilling rig. Sample locations targeted potential release pathways, such as doorways, as described in Work Plan Addendum 25 (ARCADIS, 2008c). Additionally, subslab soil gas samples were collected beneath each building.

- Phase 2 was completed to further characterize constituents detected in the subsurface at Building 1041. Vertical-aquifer profile (VAP) borings were completed on a transect downgradient of the building. Additional soil and groundwater samples were collected to delineate constituents detected in samples collected during Phase 1.

- Phase 3 was completed to supplement groundwater data collected at buildings 1041 and 1549. Additional temporary well points were installed and filtered and unfiltered groundwater samples were collected and analyzed for metals to evaluate concentrations of metals in the dissolved phase.

After Phase 1 was complete, data collected to that point was used to update the conceptual site model (CSM) and refocus any additional work on meeting the project objectives in conjunction with the project Stakeholders (i.e., USEPA, VDEQ, AEC, USACE, and RFAAP). The sampling completed in Phase 2 was targeted to evaluate specific, generally low level, detections in Phase 1 samples, as follows:

- The soil-gas detection of TCE at a Phase 1 location at building 1041 (sample 1041-3) was evaluated with VOC samples from soil at six bounding locations, and with groundwater samples collected at a downgradient transect of VAP borings.

- A polychlorinated biphenyl (PCB) detection in surface soil from a boring at building 1041 (1041-4) was evaluated with three soil samples collected by hand-auger.

- A PCB detection in groundwater from a boring at building 1041 (1041-1) was evaluated by collecting a second groundwater sample at the same location.

Sample locations are shown on **Figure 5 and 6. Table 2-1** presents the total depth of the boring, soil gas samples depth, soil sample depth, groundwater sample depth, and a description of the location for each boring. Soil boring logs and soil gas sampling logs are included in Appendices B and C, respectively. Soil and groundwater samples were submitted to Empirical Laboratories to be analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, PCBs, and inorganics. Soil gas samples were submitted to Air Toxics to be analyzed for VOCs.

Building 1034

Ten soil and eight soil gas samples were collected at Building 1034 during Phase 1 (**Figure 5**). Two soil samples were collected from each of five borings completed around the building perimeter. Surface soil samples were collected from 0.5 to 1.5 feet bgs at each location. At most locations the surface was asphalt-covered, thus the 0.5 to 1.5 sample interval was selected to target native soil as opposed to material relating to the asphalt and roadbed. Subsurface soil samples were collected at depths between 4 and 8 feet, with final depths selected based on field screening with a Photo-ionization detector (PID). Soil gas samples were collected at eight locations, including six perimeter borings and two sub-slab locations inside the north end of the building. Perimeter borings were advanced to various depths. Borings 1034-6 and 1034-8 were advanced to refusal at 22 feet bgs and boring 1034-1 was advanced to 36 feet; however, no water was encountered. Thus groundwater samples were not collected.

Building 1041

Eight soil, five soil gas, and four groundwater samples were collected at Building 1041 during Phase 1 (**Figure 5**). Soil samples were collected at four perimeter borings. Soil gas samples were collected at each of the four perimeter boring locations and at one subslab location inside the building. Groundwater samples were collected at each of the four perimeter boring locations at depths ranging from 17 to 28 feet bgs.

During Phase 2 an additional eight groundwater samples were collected. These included seven samples from a transect of five VAP borings located north (and down-gradient) of the building. Location 1041-1 was re-sampled to confirm that the trace detection of PCB was the result of high turbidity in the sample collected during Phase 1

and therefore not present in the aqueous phase. An additional nine soil samples were collected in Phase 2, including three surface soil samples to delineate PCBs detected in the shallow soil sample at boring 1041-4. Six Phase 2 soil samples were collected at depths between 6 and 8 feet bgs from six borings advanced in the vicinity of boring 1041-3, on the east side of the building. No soil gas samples were collected during Phase 2.

During Phase 3, two supplemental groundwater samples were collected from points adjacent to previous sample locations 1041-1 and 1041-3. Borings were advanced to a depth comparable to the previous sample interval or where the soil was soft indicating a water bearing zone. Temporary PVC 5-foot well screens were installed to optimize water recovery. Location 1041-20 (collected adjacent to 1041-1) was advanced to a depth of 30 ft bgs. Location 1041-21 (adjacent to 1031-3) was advanced to 26 ft bgs. Both filtered and unfiltered groundwater samples were collected from both locations and analyzed for metals.

Building 1549

One groundwater, eight soil and seven soil gas samples were collected at Building 1549 during Phase 1 (**Figure 6**). Two soils samples were collected from each of four borings completed around the building perimeter. Surface soil samples were collected below asphalt and roadbed material from 0.5 to 1.5 feet bgs at each location. Subsurface soil samples were collected at depths between 5 and 8 feet bgs. Soil gas samples were collected at seven locations, including four perimeter borings, two downgradient borings, and one subslab location inside the building. To observe the lithology, boring 1579-3(2) was advanced to refusal at 49.5 feet bgs. In an attempt to collect groundwater samples, two borings located adjacent to the building were advanced to 27 and 32 feet bgs; however groundwater was not encountered. One groundwater sample was successfully collected from 25 to 30 feet bgs at boring 1549-8, which is located downgradient of the building.

During Phase 3, two supplemental groundwater samples were collected from adjacent to previous sample locations 1549-8 and 1549-9. Borings were advanced to a depth comparable to the previous sample interval or where the soil was soft indicating a water baring zone. Temporary PVC 10-foot well screens were installed to optimize water recovery. Location 1549-9 (adjacent to 1549-7) was advanced to 29 ft bgs. Location 1549-10 (adjacent to 1549-8) was advanced to a depth of 30 ft bgs. Filtered and unfiltered groundwater samples were collected from both locations and analyzed for metals.

2.2 Field Methods

Field tasks were completed in accordance with the RFAAP Master Work Plan and Work Plan Addendum 25. USEPA's Triad Approach (2004), phased interactive approach, was developed for the site characterization which encompassed source identification. This technique was used for the evaluation of transport pathways and delineation of contamination. The dynamic investigation approach streamlines the site characterization process by providing multiple points at which the CSM can be updated as each phase of the investigation is completed. This provides the opportunity to obtain regulatory acceptance of the CSM as it develops, rather than waiting for submission of the RFI. The investigation was structured with a sequence of major components divided by decision points. At each decision point, data collected to that point was used to update the CSM and refocus any additional work on meeting the project objectives in conjunction with the project Stakeholders. The tasks are described in more detail below.

2.2.1 Direct Push Borings

During Phase 1, continuous soil samples were collected using Geoprobe™ and Macrocore direct push sampling equipment. The second phase of work used the same model Geoprobe rig, but the completed soil sampling used a combination of Geoprobe sample tools including Macrocores, dual-tube samplers, and stop-pin discrete interval samplers. By all sampling methods, undisturbed soil samples for lithologic characterization and laboratory analyses were obtained in dedicated, disposable Lexan™ liners. Soil samples were field screened for the presence of VOCs using a PID. During the second phase of work, the PID screening was supplemented with a flame-ionization detector (FID), because of its higher sensitivity to chlorinated VOCs.

Borings were completed by backfilling using bentonite chips. Soil cuttings, decontamination water, sample liners, and other disposable sampling equipment were contained in drums for off-site treatment and disposal.

2.2.2 Soil Gas Sampling

In borings advanced outside the footprint of the buildings soil gas samples were collected at depths of four to five feet bgs. Samples were collected across a six-inch interval of unsaturated formation. Sample were collected using dedicated Teflon

tubing, a laboratory calibrated flow-controller, and 1 liter volume Summa™ canisters. Ambient air in the sample tubing was purged prior to collecting the soil gas samples.

Indoor subslab soil gas samples were collected immediately beneath the concrete building slabs. Holes were drilled with a hammer drill and sealed with malleable clay. Samples were collected as above, however, using 6-liter Summa™ canisters.

2.2.3 Grab Groundwater Sampling and Vertical Aquifer Profiling

Grab groundwater samples were obtained from the direct push borings by two methods:

- Hydropunch™ sampling devices. By this method, a sealed sampler is advanced across the target interval through undisturbed soil. By pulling back the tools, the sampling device opens exposing a three or four foot stainless screen well screen. After allowing time for groundwater to enter the sampling device and equilibrate, sampling may be conducted using a peristaltic or inertial pump.

- Temporary well points. For sampling locations at the top of the water table (e.g., where vertical isolation of the sample interval is not required), samples could be collected by removing the Geoprobe tools and installing a temporary, dedicated 1-inch diameter PVC 5-foot or 10-foot well screen. Temporary well points were used particularly at locations where aquifer yield was low, and significant time was required for water to enter the well and equilibrate. Samples were collected via a peristaltic or inertial pump.

Selection of groundwater sample intervals was made by the field geologist, biased to intercept zones of higher permeability. For vertical aquifer profile borings, interval selection was also biased to collect representative samples of all discrete hydrostratigraphic intervals encountered.

Temporary well points and Hydropunch samplers were purged prior to sampling. Where feasible, the groundwater pH, temperature, conductivity and turbidity were measured using a field meter prior to sampling. All purge water generated via sampling was contained in drums for offsite treatment and disposal.

2.3 QA/QC

Quality assurance/quality control (QA/QC) samples were collected and analyzed at the frequency prescribed by the Master Quality Assurance Plan (MQAP) and the Quality Assurance Plan Addendum (QAPA). All samples were analyzed by Empirical Laboratories, LLC located in Nashville, TN. Field QC samples included field duplicates, field blanks, and trip blanks. Data was validated in accordance with the QAPA. Based on the data review, only results for benzaldehyde were qualified as rejected due to low spike recoveries. A few data points were qualified as non-detect due to associated blank contamination, and some values were qualified as estimated due to minor QC deficiencies. With the exception of the rejected benzaldehyde data, all other data were determined to be usable for the intended purpose as qualified during the data validation. Benzaldehyde is a notorious poor-performer and its poor recovery does not indicate significant technical deficiencies with analytical procedures used in this study. In addition, there is no record of its use during operations, so it is not a chemical of interest at this site. Additional details on the data review are presented in the validation reports. The applicable data flags have been appended to the project database and are presented on the summary tables provided with this report. The laboratory analytical reports and associated data validation reports are provided as Appendix D.

3.0 Investigation Results

This section presents the field observations and results of laboratory analysis of soil gas, soil and groundwater samples collected during Phase 1 and 2 of the RFI. Laboratory analytical results were compared to the following health-based screening levels.

- Soil gas analytical results were compared to both the residential and the industrial air Regional Screening Levels (RSLs) (USEPA, 2008a). Following USEPA (2002) guidance, air RSLs were adjusted by a factor of 10 to account for attenuation from shallow soil gas and subslab soil gas to indoor air.

- Soil analytical results were compared to the adjusted industrial soil RSLs, Soil to Groundwater Soil Screening Levels adjusted to dilution attenuation factor of 20 (SSL-DAF 20) (USEPA, 2008a), and to the 95 percent Upper Tolerance Levels (95% UTLs) established for naturally occurring metals in soil beneath the facility (IT, 2001).

- Groundwater analytical results were compared to tap water RSLs (USEPA, 2008a), USEPA federal Maximum Contaminant Levels (MCLs) (USEPA, 2007), and the background concentrations established in Appendix F to Attachment 3 in the Final Hazardous Waste Post Closure Care Permit for HWMUs 5, 7, 10, and 16 (October 2002). The background concentrations established for HWMU-5 were considered appropriate as this area is immediately downgradient of RAAP-047 and groundwater evaluated in this RFI was collected from the same water-bearing zone.

This section presents the results of the field observations and laboratory analysis of samples collected during Phase 1, 2, and 3 of the RFI.

3.1 Building 1034

Eight locations in and around Building 1034 (**Figure 5**) were sampled during Phase I. Soil gas and soil samples were collected and submitted for analysis. Although Hydropunch™ was advanced, groundwater was not encountered. Thus, groundwater samples were not collected. Complete laboratory analytical results are included in Appendix F.

3.1.1 Soil Gas

Soil gas samples were collected at eight locations at Building 1034, including two subslab gas locations collected beneath the basement area of the building. **Table 3-1** presents the screening levels and the results for those analytes that were detected in at least one of the soil gas samples. Analytes detected at concentrations greater than the industrial air RSLs are shown on **Figure 7**.

Seven constituents were detected at concentrations greater than either the residential or industrial air RSLs. 1,2,4-Trimethylbenzene was detected in one sample at a concentration greater than the residential air RSL (7.3 ug/m^3); however the detected level was less than the industrial air RSL (31 ug/m^3). 1,3-Butadiene was detected in six samples at concentrations greater than the industrial air RSL (4.1 ug/m^3). Benzene was detected in five soil gas samples at concentrations greater than the residential air RSL (3.1 ug/m^3); however only one detected concentration was greater than the industrial air RSL (16 ug/m^3). Bromomethane was detected in one sample at a concentration greater than the residential air RSL (5.2 ug/m^3); however the detected level was less than the industrial air RSL (22 ug/m^3). Carbon tetrachloride was detected in one sample at an estimated concentration greater than the industrial air RSL (8.2 ug/m^3). Chloroform was detected in six soil gas samples at concentrations greater than the industrial air RSL (53 ug/m^3). Low levels of chloroform have been observed in groundwater samples at concentrations less than the MCL at RFAAP and result from a disinfection byproduct associated with the public drinking water released to the subsurface by leaking water treatment and firewater system lines. Chloroform present in soil gas samples is associated with the potable water supply lines traversing the site area, and is not site-related. PCE was detected in one sample at an estimated concentration greater than the residential air RSL (4.8 ug/m^3); however the detected level was less than the industrial air RSL (21 ug/m^3). TCE was detected in four samples at concentrations greater than the residential air RSL (12 ug/m^3); however the detected levels were less than the industrial air RSL (61 ug/m^3).

3.1.2 Soil

At borings advanced around the perimeter of Building 1034, two shallow soil samples (0 to 1.5 feet bgs) and five deep (greater than 4 feet bgs) were collected. **Table 3-2** presents the screening levels and the analytical results for constituents that were detected in at least one sample. Constituents detected at concentrations greater than industrial soil RSLs are presented on **Figure 9** and discussed below. Potential risks

associated with both current industrial and future hypothetical residential use were evaluated in the Human Health Risk Assessment (HHRA) (section 5.0).

With the exception of chloroform, VOCs, explosives, and PCBs were not detected at concentrations above their industrial soil screening levels. Chloroform was detected in soil samples 1034SB001, 1034SB004, and 1034SB008 at concentrations greater than the soil to groundwater SSL-DAF20. Chloroform present in soil samples is associated with leaking potable water supply lines traversing the site and is not site-related. Five polycyclic aromatic hydrocarbons (PAHs) were detected in the shallow and deep soil samples collected at location 1034SB008 at concentrations greater than the industrial soil RSLs. The concentrations of three PAHs (benzo(a)anthracene, benzo(b)fluoranthene, dibenzo(ah)anthracene) were also greater than their soil to groundwater SSLs-DAF20. The area where 1034SB008 was located is asphalt covered and the presence of PAHs is attributed to the asphalt and roadbed materials. Other SVOCs, including dibenzofuran, fluoranthene, naphthalene, and pyrene, were detected in soil samples collected at this location; however the concentrations were less than their industrial soil RSLs. Arsenic and cobalt were the only metals detected at concentrations greater than the industrial soil RSL (1.6 mg/kg and 30 mg/kg, respectively); however, concentrations were less than the background 95% UTL (15.8 mg/kg and 72.3 mg/kg), and therefore, are not site-related.

3.1.3 Groundwater

Groundwater sampling was attempted at three locations (1034-1; 1034-6; and 1034-8) around the perimeter of Building 1034 using a Hydropunch™ sampling device. Borings 1034-6 and 1034-8 were advanced to refusal at 22 ft bgs and the Hydropunch™ screen interval was set at 18 to 22 ft bgs. At boring 1034-1 a Hydropunch™ screen was set in an interval of soft, wet material 32 to 36 feet bgs and allowed to sit for one hour. No groundwater was encountered at any of these locations. Thus groundwater samples were not collected.

3.2 Building 1041

Eighteen locations in and around Building 1041 were sampled during Phase 1 and 2 (**Figure 5**). During Phase 1, soil, soil gas and groundwater were collected around the building perimeter. Phase 2 locations included confirmation and delineation samples in addition to a downgradient transect of vertical aquifer profiling borings. Two additional groundwater samples were collected during Phase 3. Complete laboratory analytical results are included in Appendix F.

3.2.1 Soil Gas

Soil gas samples were collected at five locations at Building 1034, including one subslab gas location located beneath the basement area of the building. **Table 3-3** presents the screening levels and the results for those analytes that were detected in at least one of the soil gas samples. Analytes detected at concentrations greater than the industrial air RSLs are shown on **Figure 7.**

Five constituents were detected at concentrations greater than either the residential or industrial air RSLs. 1,3-Butadiene was detected in four soil gas samples at concentrations greater than the industrial air RSL (41 ug/m^3). Benzene was detected in four samples at concentrations greater than the residential air RSL (3.1 ug/m^3); however only one detected concentration was greater than the industrial air RSL (16 ug/m^3). Chloroform was detected in four soil gas samples at concentrations greater than the industrial air RSL (5.3 ug/m^3). Chloroform present in soil gas samples is associated with leaking potable water supply lines traversing the site and is not site-related. PCE was detected in two soil gas samples at concentrations greater than the residential air RSL (4.1 ug/m^3); one PCE concentration was also greater than the industrial air RSL (21 ug/m^3). TCE was detected in three soil gas samples at a concentration greater than the residential air RSL (12 ug/m^3); one TCE concentration was also greater than the industrial air RSL (21 ug/m^3).

3.2.2 Soil

At 11 locations around the perimeter of Building 1041, 7 shallow soil samples (0 to 2 ft bgs) and 10 deep soil samples (greater than 6 feet bgs) were collected. **Table 3-4** presents the screening levels and the analytical results for constituents that were detected in at least one sample. Constituents detected at concentrations greater than industrial soil RSLs are presented on **Figure 9** and discussed below.

With the exception of Aroclor 1254 and chloroform, VOCs, explosives, and PCBs were not detected at concentrations above their industrial screening levels. Aroclor 1254 was detected in soil sample 1041SB004 at a concentration less than the industrial soil RSL, but greater than the soil to groundwater SSL-DAF20. Three delineation soil samples (1041SB006, 1041SB007 and 1041SB008) were collected adjacent to boring 1041-4; Aroclor 1254 was not detected in any of these samples. Chloroform was detected in soil samples 1041SB002 and 1041SB018 at concentrations less than the industrial soil RSL, but greater than the soil to groundwater SSL-DAF20. Chloroform present in soil samples is associated with leaking potable water supply lines traversing

the site and is not site-related. Arsenic and cobalt were detected at concentrations greater than the industrial soil RSL (1.6 mg/kg and 30 mg/kg, respectively); however, concentrations were less than the background 95% UTL (15.8 mg/kg and 72.3 mg/kg, respectively), and therefore, are not site-related. Manganese was detected in sample 1041SB001 at a concentration greater than the industrial soil RSL (2,300 mg/kg) and the background 95% UTL (2,543 mg/kg).

3.2.3 Groundwater

A total of fourteen grab groundwater samples were collected from eleven locations around the perimeter of Building 1041. **Table 3-5** presents the screening levels and the analytical results for constituents that were detected in at least one sample. Constituents detected at concentrations greater than tap water RSLs are presented on **Figure 11**.

With the exception of Aroclor 1260 and chloroform, VOCs, explosives, and PCBs were not detected at concentrations above their screening levels. Aroclor 1260 was detected in groundwater sample 1041HP001 at a concentration (1.8 ug/L) greater than the tap water RSL (0.034 ug/l) and the MCL (0.5 ug/L); however, the groundwater sample was visibly turbid. Several studies have found that increased levels of turbidity result in the detection or increased levels of some analytes including metals, PAHs, and PCBs. During the Phase 2 sampling event, an additional sample was collected using low-stress purging. Aroclor 1260 was not detected in the confirmation sample, indicating Aroclor 1260 is not present in the dissolved phase in the groundwater and its low level detection in the initial sample was a result of the particulate matter present in the sample.

Chloroform was detected at concentrations greater than the tap water RSL (0.19 ug/L) but below the MCL (80 ug/L) in all groundwater samples collected. Chloroform present in groundwater samples is associated with leaking potable water supply lines traversing the site and not site-related. Aluminum, arsenic, copper, manganese, and vanadium were detected at concentrations greater than the tap water RSLs in one or more samples. Similar to the PCBs, the levels at which metals were detected are biased high due to the high levels of particulate matter present in the sample. Two additional temporary well points were installed during Phase 3 to collected filtered metals samples to evaluate concentration of metals in the dissolved phase. Aluminum, arsenic, barium, copper, iron, manganese, nickel, vanadium, and zinc were detected at concentrations greater than the tap water RSLs in the unfiltered groundwater samples from both sample locations. Although several metals were also detected at elevated

concentrations in the field filtered sample collected from 1041-20, it was observed the filtered sample was still visibly turbid, cloudy. The cloudy sample post filtration is likely the result of the presence of fine clays in the sampling interval. A picture of the unfiltered and filtered samples are provided with the sampling log in Appendix C. Only barium was detected at a concentration greater than the tap water RSLs but below the calculated background value in the filtered sample collected from 1031-21. No other metals were detected at concentrations greater than the tap water RSLs indicating the detected metals in sample 1041-20 are associated with particulate matter and are not present in the dissolved state.

3.3 Building 1549

The investigation evaluated nine locations in and around Building 1549 (**Figure 6**). Soil gas samples were collected at all locations. Soil samples were collected from the four locations immediately surrounding the building. Groundwater sample collection was attempted at six of the exterior locations; however, a groundwater sample could only be collected from one downgradient location during Phase 1. Two additional groundwater samples were collected during Phase 3.

3.3.1 Soil Gas

Soil gas samples were collected at seven locations at Building 1549, including one subslab gas location beneath the foundation of the building. **Table 3-6** presents the screening levels and the results for those analytes that were detected in at least one of the soil gas samples. Analytes detected at concentrations greater than the industrial air RSLs are shown on **Figure 8**.

Five constituents were detected at concentrations greater than either the residential or industrial air RSLs. 1,2,4-Trimethylbenzene was detected in two soil gas samples at concentrations greater than the residential air RSL (7.3 ug/m^3); one concentration was also greater than the industrial air RSL (31 ug/m^3). 1,3-Butadiene was detected in six soil gas samples at concentrations greater than the industrial air RSL (4.1 ug/m^3). 1,4-Dichlorobenzene was detected in two samples at concentrations greater than the residential air RSL (2.2 ug/m^3); however detected levels were less than the industrial air RSL (11 ug/m^3). Benzene was detected in six soil gas samples at concentrations greater than the residential air RSL (3.1 ug/m^3); one detected level was also greater than the industrial air RSL (16 ug/m^3). Ethylbenzene was detected in one soil gas sample at a concentration greater than the residential air RSL (9.7 ug/m^3); however the detected level was less than the industrial air RSL (49 ug/m^3).

3.3.2 Soil

At four locations around the perimeter of Building 1549, four shallow soil samples (0 to 1.5 feet bgs) and four deep (greater than 5 feet bgs) were collected. **Table 3-7** presents the screening levels and the analytical results for constituents that were detected in at least one sample. Constituents detected at concentrations greater than industrial soil RSLs are presented on **Figure 10** and discussed below.

With the exception of nitroglycerine, VOCs, explosives, and PCBs were not detected at concentrations above their screening levels. Nitroglycerine was detected in the duplicate sample for 1549SB003 at a concentration less than the industrial soil RSL, but greater than the soil to groundwater SSL-DAF20. Arsenic was the only metal detected at concentrations greater than the industrial soil RSL (1.6 mg/kg); however, concentrations were less than the background 95% UTL (15.8 mg/kg), and therefore, are not site-related.

3.3.3 Groundwater

During Phase 1 Hydropunch™ sampling devices were advanced at two borings located adjacent to the building and set at 27 and 32 feet bgs; however groundwater was not encountered; thus, no groundwater samples were collected at these locations. One groundwater sample was successfully collected from 25 to 30 feet bgs at boring 1549-8, located downgradient of the building. During Phase 3 two additional temporary well points were installed during Phase 3 and filtered and unfiltered groundwater samples were collected and analyzed for metals to evaluate concentrations of metals in the dissolved phase. **Table 3-8** presents the screening levels and the analytical results for constituents that were detected. Constituents detected at concentrations greater than tap water RSLs are presented on **Figure 12**.

No VOCs, explosives, or PCBs were detected in the groundwater sample collected during Phase 1 however aluminum, arsenic, iron, manganese, and vanadium were detected at concentrations greater than the tap water RSLs., Because of the high turbidity readings recorded for this groundwater sample (**Table 3-8**), the high levels of particulate matter potentially resulted in falsely elevated levels of dissolved metals in the groundwater samples. Groundwater samples collected in Phase 3 were analyzed for total (unfiltered) and dissolved (filtered) metals. Aluminum, arsenic, barium, beryllium, cadmium, copper, iron, manganese, mercury, nickel, vanadium, and zinc were detected at concentrations greater than the tap water RSLs in the unfiltered groundwater samples from both sample locations. Barium was the only metal detected

in the filtered samples at a concentration greater than the tap water RSLs, however both concentrations are below the calculated background value, indicating previously detected metals are associated with particulate matter and are not present in the dissolved state.

3.4 Summary of Results

Although seven VOCs were detected in collected soil gas samples at concentrations greater than their industrial RSLs, no site-related VOCs were detected in either soil or groundwater samples at concentrations greater than the industrial RSLs, with the exception of chloroform. Low levels of chloroform have been observed in groundwater samples at concentrations less than the MCL at RFAAP and are a disinfection byproduct associated with the public drinking water released to the subsurface by leaking water treatment and firewater system lines. Therefore, chloroform present in groundwater samples is associated with the potable water supply lines traversing the site area, and is not site-related. Nitroglycerin was detected in one duplicate soil sample, but not in the associated parent sample and the detected concentration was less than the residential and industrial soil RSLs. Nitroglycerin was not detected in any of the groundwater samples collected. PAH detections greater than the industrial soil RSL were limited to one location at Building 1034 and are attributed to the presence of asphalt paving.

Aroclor 1254 was detected in one soil sample, collected on the south side of Building 1041, at a level greater than the protection of groundwater RSL; however no PCBs were detected in the delineation samples, implying a limited area of extent. Aroclor 1260 was detected in one groundwater sample collected from location 1041-1, on the west side of the building, at a level greater than the tap water RSL; however the groundwater sample was visually turbid. Aroclor 1260 was not detected in the confirmation groundwater sample collected using a low-flow purging method to reduce the turbidity, indicating Aroclor 1260 is not present in the dissolved phase in the groundwater and its low level detection in the initial sample was a result of the particulate matter present in the sample. Because of the distance and position of the sample locations (soil south of the building and groundwater west of the building), it is unlikely that the detection of Aroclor 1254 in soil and the initial detection of Aroclor 1260 in groundwater are related.

Twelve metals were detected at concentrations greater than the tap water RSLs in the turbid unfiltered groundwater samples; however, metals concentration in the filtered groundwater samples, with the exception of barium, were not detected and/or less than

tap water RSLs and calculated background levels in three of the four filtered samples. Filtered sample 1041-20 was visually turbid even after filtering and the metals concentrations detected in this sample were slightly elevated in comparison to tap water RSLs and background concentrations. It is likely that the presence of metals at detectable concentrations is associated with the very fine colloidal particles that are a result of the local geology, and are not associated with the dissolved phase groundwater.

Although TCE was not detected in soil or groundwater samples collected at RAAP-047, nor in the soil and groundwater samples collected from transects between RAAP-047 and HWMU-5, it was detected in saturated soil samples from two borings located on the northeast perimeter of Unit 5 (5GP-12A and 5GP-28) ranging from 0.0019 to 0.0057 mg/kg. The presence of TCE in saturated soils is consistent with the presence of TCE in groundwater in the same vicinity. TCE was detected in groundwater samples at 6 of the 18 boring locations all of which were located east and northeast of the Unit 5. TCE concentrations ranged from non-detect to 11 ug/L. A detailed discussion of the investigation and results is provided in the Appendix I of the Permit (Correction Action Plan).

4.0 Fate and Transport of Compounds Detected at RAAP-047

Limited detections of constituents were identified in soil and groundwater samples collected from RAAP-047. The majority of concentrations are less than their respective RSLs. This section presents a discussion of the fate and transport properties that may influence the migration of constituents detected above their RSLs from one medium to another. The transport pathways of interest are migration of constituents from soil to groundwater, migration of dissolved constituents with the bulk groundwater, and volatilization of VOCs from soil or groundwater, followed by migration through the unsaturated zone and into the overlying buildings.

As discussed in the previous section the following constituents were reported at concentrations greater than the screening levels:

- Soil – nitroglycerine, Aroclor 1254, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, aluminum, arsenic, cobalt, iron, manganese, and vanadium.

- Groundwater – chloroform, aluminum, arsenic, cobalt, copper, lead, manganese, mercury, nickel, vanadium.

- Soil gas – benzene, bromodichloromethane, bromomethane, 1,3-butadiene, carbon tetrachloride, chloroform, dibromochloromethane, 1,4-dichlorobenzene, ethylbenzene, heptanes, tetrachloroethene, tetrahydrofuran, trichloroethene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2,2,4-trimethylpentane.

Migration from soil to groundwater does not appear to be a significant exposure pathway at RAAP-047. While some of the metals were detected in both soil and groundwater, the groundwater samples were turbid and the metals present were adsorbed to the particulates rather than present in the dissolved phase. Additionally, the unconsolidated materials observed at each building are dominantly low permeability clay and silt which tend to retard the movement of constituents through the soil. The PAHs and Aroclor 1254 have a high potential to adsorb to the organic material in soil and have a relatively low solubility indicating that transport through the soil column is not expected to occur. While nitroglycerine is more soluble and has a lower potential to adsorb to soils, the clays and silts present in the subsurface will hinder migration, as seen by the lack of detections in the groundwater.

VOCs present in the soil gas may migrate through the unsaturated zone into the ambient air or into buildings. The low permeability clay and silt have properties that will

limit the migration of the vapors. The tighter the subsurface material, the fewer air spaces are present and the likelihood of vapor migration decreases. Thus at the relatively low levels observed in soil gas samples, there is a low potential for migration into indoor air.

5.0 Risk Assessment

This section presents the human health risk assessment for Buildings 1034, 1041, and 1549 (RAAP-047). The risk assessment approach follows the Radford Army Ammunition Plant Final Master Work Plan (URS, 2003). The human health risk assessment was conducted consistent with methods recommended by USEPA (USEPA, 2007a; 2004a; 2000a; 1997a; 1991; 1989; 2009a). The purpose of this risk assessment is to evaluate the potential current and future risks and hazards to human health associated with constituents detected in surface and subsurface soil, groundwater, and soil gas adjacent to the three buildings.

A screening level ecological risk assessment was conducted for RAAP-047 following USEPA guidance (USEPA 1997). The site is in an industrialized area of the base and there is no habitat available for terrestrial and avian receptors. Therefore their potential exposure was not evaluated for this site. Additionally, there are no surface water bodies near this area, so potential exposure to groundwater constituents discharging to surface water was also not evaluated. Because of the nature of the site and surrounding area, it was concluded that RAAP-047 does not provide a habitat for ecological receptors.

5.1 Constituent Characterization

Section 3 of this report discusses sampling results from the current evaluation. A brief summary of the sampling results and the process for selecting constituents of potential concern (COPCs) is presented in the sections below.

5.1.1 Data Evaluation

Section 3 of this report discusses the soil gas, soil, and grab groundwater sampling conducted at RAAP-047. The data were evaluated as outlined below to identify the datasets to be used in the human health risk assessment.

- Analytical results for surface and subsurface soil samples were combined in the risk assessment to increase sample size. The combined surface and subsurface soil dataset was used to evaluate exposure to soil via ingestion, dermal contact and inhalation pathways.

- Analytical results from duplicate samples collected from the same sampling location during the same sampling event were generally considered usable for risk

assessment. Where a constituent was detected in both the original and the duplicate samples, the greater of the two results was used in the evaluation. For sample locations where one sample result showed no detectable concentration and a duplicate sample showed a detected concentration, only the detected concentration was included in the dataset. If a constituent was not detected in either the original sample or the duplicate sample, then the lower reporting limit from the two samples was used to estimate the concentration for that sample.

- Analytical results for the same chemical in one sample obtained by two different analytical methods were generally considered usable for risk assessment. During statistical analysis of the data, data for the same analyte acquired by two analytical methods were treated as follows. In the case where an analyte was detected by both methods, the higher concentration was conservatively used. If an analyte was detected in only one method, the detected concentration was used. Where the analyte was not detected by either method, the lower reporting limit was used.

- The groundwater data used to quantify potential health risks and hazards was comprised of organic data collected during the Phase 2 sampling event and dissolved metals data collected during the Phase 3 sampling event. Analytical results for metals associated with the first round of grab groundwater samples were not considered usable for risk assessment. Visible turbidity in the samples indicated that the analytical data were not representative of dissolved phase metals concentrations in the groundwater aquifer. A second round of groundwater samples was collected in 2009, and analyzed for total and dissolved metals. Turbidity of the unfiltered samples ranged from >800 to >1100 NTUs. Thus, analytical results for metals in the 2009 filtered groundwater samples were considered more representative of the groundwater quality in the aquifer. It should be noted that even after filtration, sample 1041-20 was still visible cloudy indicating the presence of very fine colloidal particles within the filtered sample. The concentrations of metals detected in this sample were higher than present in the other three filtered samples and were slightly greater than background and screening levels. These sample results were conservatively included in the HHRA and the impact on the calculation of potential risk is discussed herein.

5.1.2 Selection of Constituents of Potential Concern

Data were evaluated for usability in risk assessment by evaluating the sample type, the data qualifiers, the detection limits for non-detect results, and the spatial and vertical distribution of the data. Upon completion of that evaluation, the risk assessment

datasets identified were summarized. The data summaries include the number of samples, the number of detections, the frequency of detection, and the minimum and maximum detected concentrations.

The objective of the COPC evaluation is to identify the most toxic, persistent, and prevalent constituents at the site that are expected to contribute the majority of potential exposure and risk, consistent with USEPA (1989) guidance. COPCs were identified to focus the HHRA on those constituents present as a result of past activities at the site and of potential concern to human health. The data were compared to residential screening levels [i.e., the USEPA (2008a) RSLs] to identify COPCs. While the site usage is not residential in nature, the use of the residential RSLs provides a conservative evaluation of current conditions at the site. The maximum detected concentration of each constituent was compared to the USEPA RSLs (USEPA, 2008a). The soil gas data were compared to the residential air RSLs, multiplied by an attenuation factor of 10 because the soil gas samples were collected at 5 feet bgs. This is consistent with USEPA (2002a) guidance for evaluating the vapor intrusion pathway. If a residential air RSL was not available, then the soil gas data were compared to the shallow soil gas screening levels developed by USEPA (2002a). Soil data were compared to the residential RSLs (USEPA, 2008a).

The first submission of the RAAP-047 RFI Report in January 2009 used USEPA RSLs that were available at the time of that submission (i.e., September 2008). In May 2009, the USEPA released an updated version of the RSLs. However, the 2008 RSLs have been retained in this report for screening purposes. The uncertainty associated with the use of the September 2008 RSLs is presented in Section 5.5.

RSLs and soil gas screening levels (USEPA, 2002a) based on non-cancer effects were decreased by a factor of 10 to conservatively account for cumulative effects. Constituents present at concentrations greater than the RSLs that were not essential nutrients and those without an identified RSL were considered COPCs for that exposure pathway. The COPC selection for groundwater on a site-wide basis and the soil gas and soil for each building are discussed below.

5.1.3 Building 1034

This section presents the selection of COPCs for Building 1034 soil gas and soil.

5.1.3.1 Soil Gas

Thirty-six constituents were detected in the soil gas samples collected from the area around Building 1034. Screening levels were available for many of the constituents. If constituents were detected above the shallow soil gas screening levels, they were selected as COPCs. If a screening level was not available, the constituent was also selected as a COPC. The selected soil gas COPCs were: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,3-butadiene, 2-hexanone, isopropanol, 4-ethyltoluene, benzene, bromodichloromethane, bromomethane, carbon tetrachloride, chloroform, dibromochloromethane, ethanol, ethylbenzene, heptane, PCE, tetrahydrofuran, and TCE, as shown in **Table 5-1**.

5.1.3.2 Soil

The soil data were compared to the residential RSLs as seen on **Table 5-2**. The following 13 constituents were detected at concentrations above screening levels: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, aluminum, arsenic, cobalt, iron, manganese, and vanadium. The polycyclic aromatic hydrocarbons (PAHs) were detected in one to three samples, while the metals were detected in all ten of the samples. The maximum concentrations of the arsenic, cobalt and manganese were lower than their respective background concentrations. As a conservative measure, however, they were carried through the risk assessment.

5.1.4 Building 1041

Soil gas and soil samples were collected for Building 1041. The selection of COPCs for these media is discussed below.

5.1.4.1 Soil Gas

Thirty constituents were detected in the soil gas samples collected near Building 1041. 1,3-Butadiene, benzene, chloroform, PCE and TCE were detected above screening levels. Additionally, 2-hexanone, isopropanol, 4-ethyltoluene, ethanol, heptanes, and tetrahydrofuran were detected in the soil gas samples but did not have soil gas screening levels so were conservatively retained as COPCs (**Table 5-1)**.

5.1.4.2 Soil

The maximum soil concentrations were compared to the residential RSLs. As seen in **Table 5-2**, Aroclor 1254, aluminum, arsenic, cobalt, iron, manganese, and vanadium were detected at concentrations above the residential soil RSLs. While iron and manganese were detected at concentrations above their respective background concentrations, aluminum, arsenic, cobalt, and vanadium were detected at concentrations less than their background levels. As a conservative measure, these were carried through the risk assessment.

5.1.5 Building 1549

Soil gas and soil samples were collected for Building 1549. The selection of COPCs for these media is discussed below.

5.1.5.1 Soil Gas

Thirty-nine constituents were detected in the shallow soil gas samples collected around Building 1549. Seven of these constituents did not have shallow soil gas screening levels and were thus retained as COPCs. The thirteen selected COPCs are 1.2.4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,3-butadiene, 1,4-dichlorobenzene, 2,2,4-trimethylpentane, 2-hexanone, isopropanol, 4-ethyltoluene, benzene, ethanol, ethylbenzene, heptanes, and tetrahydrofuran, as shown in **Table 5-1**.

5.1.5.2 Soil

The soil data were compared to the residential soil RSLs, as seen in **Table 5-2**. Nitroglycerine, indeno(1,2,3-cd)pyrene, aluminum, arsenic, cobalt, iron, manganese and vanadium had maximum concentrations greater than their residential soil RSLs. Arsenic, cobalt, manganese, and vanadium were detected at concentrations lower than their respective background concentrations. As a conservative measure, they were retained as COPCs.

5.1.6 Groundwater

The groundwater data were compared to the tap water RSLs, as shown in **Table 5-3** and analytical results for lead were compared to the Action Level of 15 ug/L. Chloroform, Aroclor 1260, aluminum, arsenic, cobalt, iron, manganese, nickel and vanadium had maximum concentrations greater than the corresponding tap water RSLs.

As discussed in Section 3.2.3, although chloroform was detected at concentrations greater than the tap water RSL (0.19 ug/L), the maximum detected concentration was less than the MCL (80 ug/L). Chloroform present in groundwater samples is associated with leaking potable water supply lines traversing the site and is not site-related. Therefore, chloroform was not selected as a groundwater COPC.

Aroclor 1260 was detected in groundwater sample 1041HP001 at a concentration greater than the tap water RSL (0.034 ug/l) and the MCL (0.5 ug/L). However, as discussed in Section 3.2.3, groundwater sample 1041HP001 was turbid. During the Phase 2 sampling event, an additional sample was collected and filtered. Aroclor 1260 was not detected in the filtered sample, indicating that it is not present in the dissolved phase in the groundwater, and its low level detection in the initial sample was a result of the particulate matter present in the sample. Therefore, Aroclor 1260 was not selected as a groundwater COPC.

The maximum detected concentrations of aluminum, arsenic, cobalt, iron, manganese, nickel and vanadium were greater than their tap water RSLs. Therefore, these metals were retained as COPCs in groundwater.

5.1.7 Physical and Chemical Properties

The environmental fate and transport of constituents depend on the physical and chemical properties of the constituents, the environmental transformation processes affecting them, and the media through which the constituents are migrating. **Table 5-4** provides the physical and chemical properties used in the risk assessment and includes the molecular weight, water solubility, vapor pressure, Henry's Law Constant, diffusivity in air and water, the organic carbon partition coefficient (K_{oc}), the soil-water distribution coefficient (K_d), and the octanol-water partition coefficient (K_{ow}).

5.2 Exposure Assessment

Exposure pathways have been identified based on an evaluation of the site characterization information and the fate and transport properties of the constituents of interest. The exposure pathways evaluated identify likely points where human receptors may contact affected media under current or reasonably anticipated future use at the site. The principal pathways by which exposure could occur are identified and presented in this section.

An exposure pathway is defined by the following four elements: (1) a source and mechanism of constituent release to the environment; (2) an environmental transport medium for the released constituent; (3) a point of potential contact with the affected medium (the exposure point); and (4) an exposure route at the exposure point (USEPA, 1989). The purpose of the exposure assessment is to estimate the ways in which a population may potentially be exposed to constituents at a site. This typically involves projecting concentrations along potential pathways between sources and receptors. The projection is usually accomplished using site-specific data and, when necessary, mathematical modeling. Exposure can occur only when the potential exists for a receptor to directly contact released constituents or when there is a mechanism for released constituents to be transported to a receptor. Without exposure there is no risk; therefore, the exposure assessment is a critical component of the risk assessment.

This site is within the main industrial area. It is in a developed area that is covered with buildings and pavement. While direct contact with soils is not likely to occur under current conditions, it has been conservatively assumed that such exposure could occur. In addition, volatile materials present in the subsurface may migrate through the unsaturated zone into buildings constructed on the site. Thus, under the current use scenario, potential exposure of site workers is evaluated for direct contact with soil and the vapor intrusion pathway.

Groundwater is not currently used as a potable water supply at the site, and groundwater use is unlikely to occur in the future. However, potential future exposure to groundwater as a potable water supply (i.e., ingestion as tap water) was evaluated in the risk assessment for conservatism and for risk management decision-making.

Although current and reasonably anticipated future use of the site is industrial, hypothetical future residential use scenarios have been evaluated in order to assist the Army to make risk management decisions. If residential development were to occur, then construction workers and residents could be exposed to constituents in the surface and subsurface soils.

While construction workers would work in the subsurface environment, they are unlikely to come into contact with constituents in groundwater because the depth to groundwater is 14 feet or greater. Therefore, construction worker exposure to groundwater was not evaluated in the risk assessment.

Should the site be redeveloped, hypothetical future residents could be exposed through the vapor intrusion pathway. In addition, while the use of groundwater as a potable water supply is not expected to occur, potential future exposure to groundwater was evaluated for future residents in the risk assessment for conservatism and for risk management decision-making. The groundwater exposure pathways evaluated for residents include groundwater ingestion and dermal contact during showering/bathing. No VOCs were retained as COPC, so the inhalation of vapors during showering/bathing was not evaluated identified as a potentially complete exposure pathway and was not evaluated in this HHRA.

5.2.1 Exposure Point Concentration

Exposure points are defined as areas where contact with COPCs occurs, generally with equal probability across the entire area under evaluation. The exposure point concentration (EPC) is a representative constituent concentration that a receptor may contact at an exposure point over the exposure period (USEPA 1989). The EPC is the representative concentration of a constituent in an environmental medium that is potentially contacted by the receptor (USEPA 1989) and is defined as "the arithmetic average of the concentration that is contacted over the exposure period" (USEPA 1989). To assure that the estimate of the arithmetic average is conservative and is not underestimated, the upper confidence limit on the mean (UCL) concentration is used as an estimate of the EPC (USEPA 1989; 2002b).

Calculation of UCLs was performed using the USEPA's ProUCL (Version 4.0; USEPA 2007). The maximum concentration was retained as the EPC where the estimation of the UCL via ProUCL was not possible due to datasets that were not of sufficient sample size and/or in which the frequency of detection was small. It was recognized that this practice would result in risk estimates that are not representative of average conditions as stated by USEPA (2007). The soil gas EPCs are presented in **Table 5-5**. EPCs for soil exposure are presented in **Table 5-6** for each building. In groundwater, the maximum detected COPC concentration was used as the EPC due to the small number of samples available. Site-wide groundwater EPCs are presented in **Table 5-7**.

As discussed in Section 5.1.1, analytical data for surface and subsurface soil samples were combined to calculate soil EPCs for each building for each COPC, given the low sample size for surface soil at each building. The combined surface and subsurface soil dataset was used to evaluate exposure to soil via ingestion, dermal contact and inhalation pathways. Analytical data from groundwater samples collected near the

three buildings were combined to generate sitewide EPCs for each COPC in groundwater.

5.2.2 Exposure Assumptions

The exposure scenarios considered in the risk assessment rely on information applicable to specific populations, behavior patterns, and intake values for the quantitative exposure assessment. USEPA guidance has been used to aid in the evaluation of the exposure pathways. The exposure factors used to quantify exposure are summarized in **Table 5-8**. The exposure assumptions used to evaluate the current/future site worker, future construction worker, and hypothetical future adult and child resident are discussed below. The equations used to calculate potential exposures to constituents in soil are presented in **Table 5-9,** and **Table 5-10** presents the equations used to calculate potential exposure to constituents in groundwater. **Table 5-11** presents the calculation of the Particulate Emission Factor used to evaluate receptor exposure to inhalation of soil particulates. **Table 5-12** presents chemical-specific dermal absorption efficiencies and permeability coefficients for the COPCs.

Exposure to vapors migrating from the subsurface into indoor air was evaluated using the USEPA (2004a) vapor intrusion soil gas model based on the Johnson and Ettinger (1991) paper. This is a conservative model used to evaluate the potential for vapor intrusion. The results are used to evaluate the potential for this exposure to occur (U.S. Department of the Army 2006).

Site-specific soil parameters were used in the model. Soil at each building is classified as a silty clay or clayey silt to depths of 4 to 5 feet. Thus, soil was classified as silty clay in the model runs and default USEPA (2004a) assumptions were used together with the air exchange rates recommended by ASTM (1995). The vapor intrusion model estimates the potential associated risk and calculates risk-based medium concentrations for both industrial and residential settings. A summary of input parameters is included in Appendix E together with the physical and chemical properties for the constituents evaluated by this pathway and the model output. The following subsections present exposure parameters for potential receptors.

5.2.2.1 Site Worker

A site worker is assumed to be present at RAAP, working indoors on a long-term basis, with potential to contact outdoor surface soils when walking between buildings or taking breaks. Currently groundwater is not used as a potable water supply so that

exposure to groundwater is not expected to occur for the current site worker. Nevertheless, groundwater ingestion was conservatively evaluated as a potential future exposure pathway for the site worker in the risk assessment to assist in risk management decision-making. Vapors present in soil gas may migrate into a building on the site. Site workers then could inhale these vapors and be exposed to these constituents. Thus, potential exposures to the current/future site work were evaluated for direct contact with soil (dermal contact and ingestion), inhalation of outdoor dust and indoor vapors, and ingestion of groundwater.

The exposure assumptions for this potential receptor are included in **Table 5-8** and are summarized as follows:

- Adult body weight of 70 kilograms (kg) (USEPA, 1991; 1989);
- Exposure duration of 25 years (USEPA, 1991; 1989);
- Exposure frequency of 250 days/year (5 workdays/week for 50 weeks/year) (USEPA, 1991);
- Incidental soil ingestion rate of 50 milligrams per day (mg/day) (USEPA, 1991);
- Exposed skin surface area of 3,300 square centimeters (cm^2), which is the sum of the mean values for hands, forearms, and face for an adult (USEPA, 2004b);
- Soil adherence rate of 0.1 milligrams per square centimeter per day (mg/cm^2-day), based on the description in the guidance for a groundskeeper with limited direct soil contact (USEPA, 2004b; 2002c);
- Exposure time for inhalation exposure of 8 hours/day (USEPA 1991, 2009a); and
- Groundwater ingestion rate of 1 L/day for adult exposure (USEPA 1989, 1991).

The inhalation of vapor exposure scenario was evaluated using the USEPA (2004a) soil gas versions of the Johnson & Ettinger model spreadsheets.

5.2.2.2 Hypothetical Future Construction Worker

Construction workers may be present in the future to work on new construction or excavation activities; therefore, this exposure scenario was evaluated based on a

hypothetical construction project. The construction project was assumed to take 6 months (130 working days) to complete. As discussed above, construction workers could have direct contact with constituents in the surface and subsurface soils and could inhale dusts derived from those soils. While construction workers would work in the subsurface environment, they are unlikely to come into contact with constituents in groundwater, given its depth. Thus only direct contact with soil and inhalation of dusts were evaluated for this exposure scenario.

The exposure assumptions for this potential receptor are included in **Table 5-8** and are summarized as follows:

- Adult body weight of 70 kg (USEPA 1991; 1989);
- Exposure duration 1 year (professional judgment);
- Exposure frequency of 130 days/year (5 workdays/week for 6 months) (professional judgment);
- Incidental soil ingestion rate of 330 mg/day (USEPA 2002c);
- Exposed skin surface area of 3,300 cm^2, which is the sum of the mean values for hands, forearms, and face for an adult (USEPA 2004b; 2002c);
- Soil adherence rate of 0.3 mg/cm^2/day (USEPA 2004b; 2002c); and
- Exposure time for inhalation exposure of 8 hr/day (USEPA 1991; 2009a).

5.2.2.3 Hypothetical Future Adult and Child Resident

Residential development is not expected to occur as the current land use associated with RAAP-047 is not expected to change. However, hypothetical future residential use of the site was considered in this risk assessment to provide a conservative evaluation of potential future exposures under unrestricted uses. Exposures of both young children and adults to soil (ingestion, dermal contact and inhalation of dust), soil gas (via vapor intrusion) and groundwater (via tap water ingestion) were evaluated. The exposure assumptions for the hypothetical future resident are presented in **Table 5-8** and are summarized below.

- Adult body weight of 70 kg and a young child body weight of 15 kg (USEPA, 1991; 1989);
- Exposure duration of 6 years for a young child and 30 years for an adult (professional judgment) (USEPA, 1989; 1991);
- Exposure frequency of 350 days/year (USEPA, 1991; 1989);
- Soil ingestion rate of 100 mg/day for adults and 200 mg/kg for young children (USEPA, 1991; 1989);
- Exposed skin surface area for soil of 5,700 cm^2 for adults and 2,800 cm^2 for young children (USEPA, 2004b);
- Soil to skin adherence rate of 0.07 mg/cm^2/day for adults and 0.2 mg/cm^2/day for young children (USEPA, 2004b);
- Exposure time for inhalation exposure of 24 hours/day (USEPA 1991, 2009);
- Groundwater ingestion rate of 2 L/day for adult exposure and 1 L/day for child exposure (USEPA 1989, 1991).
- Exposed skin surface area for groundwater used for showering/bathing of 18,000 cm^2 for adults and 6,600 cm^2 for young children (USEPA, 2004b);
- Event frequency of one showering/bathing event per day (USEPA, 2004b); and
- Event time of 0.58 hour for adult dermal exposure to groundwater and 1 hour for child dermal exposure to groundwater (USEPA, 2004b).

5.3 Toxicity Assessment

This section discusses the two general categories of toxic effects (non-carcinogenic and carcinogenic) and constituent-specific toxicity values used to calculate potential risks for these two types of toxic effects. Toxicity values for potential non-carcinogenic and carcinogenic effects are identified from available databases. For this risk assessment, toxicity values were obtained from the following tiered sources established by USEPA, in order of priority:

- USEPA's IRIS online database (USEPA 2009b).

- USEPA's Provisional Peer Reviewed Toxicity Value (PPRTV) Database (USEPA 2009c). This source was consulted when toxicity values were unavailable in IRIS.

- Other toxicity values, including values obtained from the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) Toxicity Criteria Database (Cal/EPA 2009), Agency for Toxic Substances and Disease Registry (ATSDR 2008) Minimal Risk Levels, and USEPA (1997b) Health Effects Assessment Summary Tables (HEAST).

5.3.1 Non-carcinogenic Effects

For many non-carcinogenic effects, protective mechanisms must be overcome before an effect is manifested. Therefore, a finite dose (threshold), below which adverse effects will not occur, exists for non-carcinogens. COPCs may exhibit their toxic effects at the point of application or contact (local effect) or at other sites (systemic effects) after they have been distributed throughout the body. Most COPCs can produce more than one type of toxic effect, depending on the dose and the susceptibility of the exposed individual or receptor. The goal of toxicity studies for application in risk assessment is to identify the most sensitive toxic effect and the exposure levels that are expected to be safe. The potential for non-carcinogenic effects is estimated by comparing a calculated dose with a reference dose (RfD) and/or a calculated average exposure concentration with a reference concentration (RfC) for each individual constituent. The RfD (or RfC) represents a daily exposure level that is expected to be protective of human health, even for sensitive individuals or subpopulations.

Chronic RfDs and RfCs are used to assess long-term exposures ranging from 7 years to a lifetime. Subchronic RfDs and RfCs are used to evaluate the potential for adverse health effects associated with exposure to constituents over a period of 2 weeks to 7 years.

Table 5-13 presents the RfDs used to assess oral and dermal exposure, and **Table 5-14** presents the RfCs used to assess inhalation exposure. **Tables 5-13** and **5-14** also present the target sites associated with the non-carcinogenic toxicity values for each constituent varying with the exposure route. Confidence ratings and uncertainty factors associated with the RfDs and RfCs also are listed, where available. The uncertainty factor represents areas of uncertainty inherent in the extrapolation from the available

data. The confidence levels (low, medium, high) assess the degree of confidence in the extrapolation using available data.

5.3.2 Carcinogenic Effects

Cancer induction in humans and animals by chemicals proceeds through a complex series of reactions and processes. Carcinogenic constituents may produce tumors at the point of application or contact, or they may produce tumors in other tissues after they have been distributed throughout the body. Some constituents are associated only with one or two tumor types while others may cause tumors at many different sites.

Constituents are classified as known, probable, or possible human carcinogens based on a USEPA weight-of-evidence scheme in which they are systematically evaluated for their ability to cause cancer in humans or laboratory animals. The USEPA classification scheme (USEPA, 1986) contains five classes based on the weight of available evidence, as follows:

A known human carcinogen;

B probable human carcinogen:

- B1 probable human carcinogen—limited evidence in humans;
- B2 probable human carcinogen—sufficient evidence in animals and inadequate data in humans;

C possible human carcinogen—limited evidence in animals;

D inadequate evidence to classify; and

E evidence of noncarcinogenicity.

Constituents in Classes A, B1, and B2 generally are evaluated as carcinogens in risk assessments; however, Class C carcinogens may be evaluated on a case-by-case basis (USEPA, 1989). Two COPCs were identified as Class A carcinogens (benzene and arsenic), 11 COPCs were identified as Class B2 carcinogens (bromodichloromethane; 1,3-butadiene; carbon tetrachloride; chloroform; PCE; benzo[a]anthracene; benzo[a]pyrene; benzo[b]fluoranthene; dibenzo[a,h]anthracene; indeno[1,2,3-cd]pyrene; and Aroclor 1254), one COPC was identified as a Class C carcinogen (dibromochloromethane), and three COPCs were identified as Class D (bromomethane; ethylbenzene and manganese). The other constituents were not classified.

For carcinogens, the current risk assessment guidelines (USEPA, 1989) use a conservative approach in which it is assumed that any level of exposure could cause cancer. Based on this assumption, USEPA extrapolates from laboratory animal data using a mathematical model known as the linear multi-stage model. This model plots a line through the zero point and, based on the slope of this dose-response line, assigns a risk level for increasingly smaller doses of a particular compound. The 95 percent UCL for the slope of this line, called the cancer slope factor (CSF), is used to calculate the probability of an effect associated with a given dose. A CSF represents the 95 UCL of the slope of the dose-response curve. A unit risk factor (URF) expresses the dose-response relationship in terms of risk per unit concentration of a constituent in an environmental medium, such as air, where exposure may occur. USEPA's carcinogenic toxicity factors are thus determined by a methodology that is likely to overestimate real risk. An even greater problem may lie in the USEPA assumption of dose and response additivity for carcinogenic effects. Research by USEPA has suggested that summing upper-bound excess cancer risks from several carcinogens may overestimate a true upper-bound risk for the mixture (Cogliano, 1997).

Tables 5-15 and **5-16** present the carcinogenic toxicity values for oral and dermal exposure and inhalation exposure (respectively) to the COPCs at the site. The carcinogenic toxicity values used in the calculation of potential cancer risks are the CSF and URF, which are derived from the conservative assumption that any dose level has a possibility of causing cancer. The cumulative dose, regardless of the particular exposure period, determines the risk; therefore, separate CSFs and URFs are not derived for subchronic and chronic exposure periods.

5.3.3 Dermal Toxicity Values and Dermal Absorption

Whenever possible, route-specific toxicity values have been used; however, USEPA has not yet developed toxicity values for dermal exposures. For this reason, the oral toxicity values (RfD_o and CSF_o) and the oral absorption efficiency were used to derive adjusted toxicity values (RfD_a and CSF_a) (adjusted to the absorbed dose) for use in assessing dermal exposure (USEPA, 2004b):

$$RfD_a = RfD_o \times \text{Oral Absorption Efficiency}$$

$$CSF_a = CSF_o / \text{Oral Absorption Efficiency}$$

The adjusted toxicity values represent the theoretical toxicity of the orally absorbed dose of the constituent. The USEPA (2004b) guidance recommends that the oral

toxicity values for organic constituents and many inorganic constituents should not be adjusted to assess dermal exposure (i.e., oral absorption efficiency = 1) and presents recommended oral absorption efficiencies for a few inorganics. **Table 5-13** presents the oral absorption efficiency values and the RfD_as used to assess risk for the dermal exposure route. **Table 5-15** presents the CSF_as. Uncertainty is associated with the adjusted toxicity values and with the dermal risks derived using these values due to the uncertainty in the oral toxicity values combined with the uncertainty in the oral absorption efficiency default and constituent-specific values. However, the calculated dermal risks are expected to be conservative estimates, and therefore, will likely overestimate human health risks.

5.4 Risk Characterization

Potential risks to human health are evaluated quantitatively by combining calculated exposure levels and toxicity data. A distinction is made between non-carcinogenic and carcinogenic endpoints, and two general criteria are used to describe the hazard quotient (HQ) for non-carcinogenic effects and excess lifetime cancer risk (ELCR) for constituents evaluated as human carcinogens.

The results of the risk characterization step are discussed by building and by receptor because the COPCs in soil and soil gas for each building are different. However estimated hazards and risk from hypothetical future exposure to groundwater are consistent for each building, because groundwater exposure is estimated based on the maximum detected concentrations. Within the context of each building area considered, the potential receptors are site workers, hypothetical future construction workers and hypothetical future adult and child residents.

5.4.1 Hazard Quotient for Noncancer Hazard

Exposure doses are averaged over the expected exposure period to evaluate non-carcinogenic effects. The HQ is the ratio of the estimated dose or average exposure concentration and the non-cancer toxicity value. Thus, an HQ greater than 1 indicates that the estimated exposure level for that constituent is greater than the non-cancer toxicity value. This ratio does not provide the probability of an adverse effect. Although an HQ less than 1 indicates that health effects should not occur, an HQ above 1 does not imply that health effects will occur, but instead that health effects are possible.

The sum of the HQs is the hazard index (HI). A limitation with the HI approach is that the assumption of dose additivity is applied to compounds that may induce different effects by different mechanisms of action. Consequently, the summing of HIs for a number of compounds that are not expected to induce the same type of effects or that do not act by the same mechanism may overestimate the potential for toxic effects. Consistent with USEPA risk assessment guidelines for chemical mixtures, in the event that the total HI for an exposure scenario is greater than 1, it is incumbent on a risk assessor to segregate HQs by target organ/critical effect (USEPA, 1989). Therefore, if the calculated HI is greater than 1 as a consequence of summing several HQs for constituents not expected to induce the same type of effects or that do not act by the same mechanism, the HIs may be segregated by effect and mechanism of action to derive separate HIs for each target-organ/critical-effect group (USEPA, 1989).

5.4.2 Excess Lifetime Cancer Risk

The ELCR is an estimate of the potential increased risk of cancer that results from lifetime exposure, at specified average daily dosages, to constituents detected in media at a site. Estimated doses or lifetime exposure concentrations for each constituent are averaged over the hypothetical lifetime of 70 years. It is assumed that a large dose received over a short period is equivalent to a smaller dose received over a longer period, as long as the total doses are equal. The ELCR is calculated as the product of the dose or lifetime average exposure concentration and the cancer toxicity value. The risk estimate is considered to be an upper-bound estimate; therefore, it is likely that the true risk is far less than that predicted by the model. The individual pathway ELCRs are summed to calculate a total ELCR. The risk estimate is compared to USEPA's generally acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$.

5.4.2.1 Building 1034

Direct contact with soil was evaluated for the current/future site worker, future construction worker, and hypothetical future resident. In addition, inhalation of indoor air and ingestion of groundwater were evaluated for the site worker and hypothetical future residential scenario. **Table 5-17** summarizes the calculation results, and the individual risk calculation sheets are provided in Appendix E.

Site Worker

Under the current use exposure scenario, which includes direct contact with soil and inhalation of indoor air, the estimated potential total ELCR is $2\times10^{-5}$and the estimated HI is 0.1 (**Table 5-17)**. The ELCR is approximately at the midpoint of the USEPA generally acceptable risk range and the HI is well below the benchmark of 1. These risks and hazards are primarily due to direct contact with soil as the ELCR for the vapor intrusion pathway was 2×10^{-7} and the HI for that pathway was 0.0003, both well below benchmark levels. Given that the area surrounding Building 1034 is primarily paved, the estimated total ELCR for soil exposure is likely overstated.

Under the hypothetical future exposure scenario, a site worker could also contact groundwater through the ingestion pathway, if groundwater is used for potable purposes. The total calculated ELCR and HI for the hypothetical future site worker, including the ingestion of groundwater, were 9×10^{-5} and 3, respectively (**Table 5-17)**. The ELCR is within the USEPA generally acceptable risk range. The HI is marginally greater than the benchmark of 1; however, when the HI was segregated by target organ/critical effect, each individual HI was less than or equal to 1 (**Table 5-17**), indicating potential adverse effects are unlikely.

Construction Worker

A construction worker was assumed to contact soil during construction activities around Building 1034. The calculated ELCR for soil exposure was 2×10^{-6} which is at the low end of the generally acceptable risk range, as seen on **Table 5-17**. The HI was calculated to be 0.9 which is below the benchmark HI of 1.

Adult Resident

For the hypothetical future residential exposure scenario, adult and child residents could potentially have direct contact with soil, inhale vapors migrating into homes, or

ingest groundwater. **Table 5-17** summarizes the calculated risks of adult resident direct contact exposure to soil, exposure to soil gas through the inhalation of vapor pathway, and through groundwater ingestion and dermal contact.

The total calculated ELCR for exposure to the adult resident is 3×10^{-4} and the HI is 9. These values exceed the USEPA's generally acceptable risk range and target HI, respectively, due to the assumed ingestion of groundwater (ELCR of 2×10^{-4} and HI of 8). Excluding the groundwater ingestion pathway, total risks to the adult resident would be 5×10^{-5} and the HI would be 0.4, which are within the generally acceptable risk range.

The calculated risks for the groundwater ingestion pathway are solely attributable to the arsenic detected in a single filtered groundwater sample (1041HP020 25-30) at 12.3 ug/L. As noted, even after filtration this sample was still visibly turbid and metals concentrations in this sample are likely elevated due to the presence of very fine colloidal particles. Arsenic was not detected in the other three samples collected at the site and the use of the maximum detected concentration as the EPC is a conservative measure recommended by current guidance. Therefore, it is likely that potential risks are overstated.

The HI for the groundwater ingestion pathway is greater than the benchmark of 1 even when evaluated by target organ/critical effect. These hypothetical hazards are driven by arsenic, cobalt, and iron , which are likely due to localized geology, as these metals were not detected in any of the other filtered groundwater samples that were collected. Therefore, it is likely that potential hazards are also overstated.

Child Resident

The risks and hazards of hypothetical future exposure of young children to soil, soil gas, and groundwater is summarized in **Table 5-17**, and the calculation tables are included in Appendix E. The total calculated ELCR and HI for the child resident are $2x10^{-04}$ and 39, respectively. Both of these values exceed USEPA benchmarks. Excluding the groundwater pathway, the potential risk is 9×10^{-5} and the HI is 3, due to direct contact exposures with soils. This calculated ELCR is within the generally acceptable risk range while the HI was greater than the noncancer benchmark. However, when the HI was reevaluated by segregating the constituents by critical effect/target organ, the recalculated HIs were all equal to or less than the benchmark of 1, except the HI for the liver (2), which marginally exceeded the benchmark of 1. The elevated HI is primarily associated with the presence of iron in the soil. As shown in

Table 5-17, inhalation of vapors had a negligible contribution to the ELCR and HI (3×10^{-7} and 0.002, respectively).

As discussed for the hypothetical future adult resident, the elevated ELCR due to groundwater is solely attributable to the arsenic concentration detected in a single sample (1041-20), which is likely to be related to localized geology. Therefore, potential risks may be overstated. The HI is greater than the benchmark of 1, even when evaluated by target organ/critical effect. However, this HI is driven by the concentrations of iron, cobalt and arsenic at 1041-20 and is likely elevated due to localized geology, because these metals were not detected in any of the other filtered groundwater samples. Therefore, potential hazards are also likely overstated.

Table 5-17 summarizes the results of the risk characterization step for Building 1034. Excluding the estimated risks and hazards from exposure to groundwater which are likely driven by concentrations of arsenic, iron and cobalt that result from localized geological characteristics surrounding a single sample location, the calculated risks and hazards are within the generally acceptable limits for unrestricted use.

5.4.2.2 Building 1041

Direct contact with soil was evaluated for the current/future site worker, future construction worker, and hypothetical future resident at Building 1041. In addition, inhalation of indoor air and ingestion of groundwater were evaluated for the site worker and hypothetical future residential scenario. **Table 5-18** summarizes the calculation results, and the individual risk calculation sheets are provided in Appendix E.

Site Worker

Under the current site worker exposure scenario, which includes direct contact with soil and inhalation of indoor air, the estimated potential total ELCR is 1×10^{-6} and the estimated HI is 0.1 (**Table 5-18)**. The ELCR is at the lower limit of the USEPA target risk range and the HI is well below the benchmark of 1. These risks and hazards are primarily due to direct contact with soil as the ELCR for the vapor intrusion pathway was 2×10^{-8} and the HI for that pathway was 0.00009, both of which are well below benchmark levels. Given that the area surrounding Building 1041 is primarily paved, the estimated total ELCR for soil exposure is likely overstated.

Under the hypothetical future site worker scenario, a site worker could also contact groundwater through the ingestion pathway, if groundwater is used for potable

purposes. The total calculated ELCR and HI for the hypothetical future site worker, including the ingestion of groundwater, were 7×10^{-5} and 3, respectively (**Table 5-18)**. The ELCR is near the upper end but still within the USEPA target risk range. The HI is marginally greater than the benchmark of 1; however, when the HI was segregated by target organ/critical effect, each individual HI was less than or equal to 1 (**Table 5-18**), indicating no potential adverse effects.

Construction Worker

A construction worker was assumed to contact soil during construction activities around Building 1041. The calculated ELCR for soil exposure was 2×10^{-7} which is below the target risk range, as seen on **Table 5-18**. The HI was calculated to be 0.8 which is below the benchmark HI of 1.

Adult Resident

For the hypothetical future residential exposure scenario, adult and child residents could potentially have direct contact with soil, inhale vapors migrating into homes, or ingest groundwater. **Table 5-18** summarizes the calculated risks of adult resident direct contact exposure to soil, exposure to soil gas through the inhalation of vapor pathway, and through groundwater ingestion and dermal contact.

The total calculated ELCR for exposure to the adult resident is 2×10^{-4} and the HI is 9. These values exceed the USEPA's target risk range and target HI, respectively, due to the assumed ingestion of groundwater (ELCR of 2×10^{-4} and HI of 8). Excluding the groundwater ingestion pathway, the calculated risk for the adult resident is 4×10^{-6} and the HI is 0.4, both of which are within generally acceptable levels.

As discussed for Building 1034, the calculated risk and hazard for the groundwater ingestion pathway are solely attributable to the arsenic concentration detected in a single filtered groundwater sample (1041HP020 25-30), which was the concentration used for the risk calculation. However, it is important to note that arsenic was not detected in any of the other four filtered groundwater samples that were analyzed. This would appear to indicate that the elevated arsenic concentration in that sample may have been due to localized geological characteristics immediately surrounding that sample location. Therefore, it is likely that potential risks are overstated.

The HI for the groundwater ingestion pathway is greater than the benchmark of 1 even when evaluated by target organ/critical effect. These hypothetical hazards are driven

by iron, cobalt and arsenic, which also may be present due to localized geology, since these metals were not detected in any of the other four filtered groundwater samples that were collected. Therefore, it is likely that potential hazards are also overstated.

Child Resident

The risks and hazards of hypothetical future exposure of young children to soil, soil gas, and groundwater is summarized in **Table 5-18**, and the calculation tables are included in Appendix E. The total calculated ELCR and HI for the child resident are 2×10^{-4} and 38, respectively. Both of these values exceed USEPA benchmarks. Without the ingestion of groundwater, however, the risks would be 7×10^{-6} and the HI would be 3, due to direct contact exposures with soils. This calculated ELCR is at the upper end but still within the target risk range while the HI was greater than the noncancer benchmark. However, when the HI was reevaluated by segregating the constituents by critical effect/target organ, the recalculated HIs were all equal to or less than the benchmark of 1. As shown in **Table 5-18,** inhalation of vapors had a negligible contribution to the ELCR and HI (4×10^{-8} and 0.0006, respectively).

As discussed for the hypothetical future adult resident, the elevated ELCR due to groundwater is solely attributable to the arsenic concentration detected in a single sample, which is likely to be related to localized geology. Therefore, potential risks may be overstated. The HI including groundwater is greater than the benchmark of 1, even when evaluated by target organ/critical effect. However, this HI is driven by the concentrations of iron, cobalt and arsenic at a single sampling location and may be elevated due to localized geology, since these metals were not detected in any of the other four filtered groundwater samples. Therefore, potential hazards are also likely overstated.

Table 5-18 summarizes the results of the risk characterization step for Building 1041. Given that estimated risks and hazards from exposure to groundwater are likely driven by concentrations of arsenic, iron and cobalt that result from localized geological characteristics surrounding a single sample location, the calculated risks and hazards are within the generally acceptable limits for unrestricted use.

5.4.2.3 Building 1549

Direct contact with soil was evaluated for the current/future site worker, future construction worker, and hypothetical future resident at Building 1549. In addition, inhalation of indoor air and ingestion of groundwater were evaluated for the

current/future site worker and hypothetical future residential scenario. **Table 5-19** summarizes the calculation results, and the individual risk calculation sheets are provided in Appendix E.

Site Worker

Under the current site worker exposure scenario, which includes direct contact with soil and inhalation of indoor air, the estimated potential total ELCR is 2×10^{-6} and the estimated HI is 0.1 (**Table 5-19)**. The ELCR is at the lower end of the USEPA target risk range and the HI is well below the benchmark of 1. These risks and hazards are primarily due to direct contact with soil as the ELCR for the vapor intrusion pathway was 2×10^{-9} and the HI for that pathway was 0.0002, both of which are well below benchmark levels. Given that the area surrounding Building 1034 is primarily paved, the estimated total ELCR for soil exposure is likely overstated.

Under the hypothetical future site worker scenario, a site worker could also contact groundwater through the ingestion pathway, if groundwater is used for potable purposes. The total calculated ELCR and HI for the hypothetical future site worker, including the ingestion of groundwater, were 7×10^{-5} and 3, respectively (**Table 5-19)**. When segregated by target organ/critical effect, the HIs are equal to or less than one indicating that adverse effects are unlikely. The ELCR is near the upper end but still within the generally acceptable risk range (**Table 5-19**).

Construction Worker

A construction worker was assumed to contact soil during construction activities around Building 1549. The calculated ELCR for soil exposure was 2×10^{-7} which is below the target risk range, as seen on **Table 5-19**. The HI was calculated to be 0.7 which is below the benchmark HI of 1.

For the hypothetical future residential exposure scenario, adult and child residents could potentially have direct contact with soil, inhale vapors migrating into homes, or ingest groundwater. **Table 5-19** summarizes the calculated risks of adult resident direct contact exposure to soil, exposure to soil gas through the inhalation of vapor pathway, and through groundwater ingestion and dermal contact.

Adult Resident

The total calculated ELCR for exposure to the adult resident is 2×10^{-4} and the HI is 9. These values exceed the USEPA's target risk range and target HI, respectively, due to the assumed ingestion of groundwater (ELCR of 2×10^{-4} and HI of 8). Without the groundwater ingestion pathway, total risks to the adult resident would be 6×10^{-6} and the HI would be 0.3. These estimated risk and hazards are due primarily to direct contact with soil (ELCR of 6×10^{-6} and an HI of 0.3) with negligible contribution from the vapor inhalation pathway (ELCR of 1×10^{-8} and HI of 0.001). Without the groundwater ingestion pathway, risks and hazards are within USEPA's acceptable levels.

As discussed for Building 1034, the elevated risk and HI for the groundwater ingestion pathway are solely attributable to the presence of metals detected in a single filtered groundwater sample (1041HP020 25-30). This sample was visibly turbid even after filtration and the metals are likely associated with the presence of very fine colloidal particles in the sample. Therefore, it is likely that potential risks are overstated.

Child Resident

The risks and hazards of hypothetical future exposure of young children to soil, soil gas, and groundwater is summarized in **Table 5-19**, and the calculation tables are included in Appendix E. The total calculated ELCR and HI for the child resident are 2×10^{-4} and 32, respectively. Both of these values exceed USEPA benchmarks. Without the ingestion of groundwater, however, the risks would be 1×10^{-5} and the HI would be 3, due to direct contact exposures with soils. This calculated ELCR is at the midpoint of the target risk range while the HI was greater than the noncancer benchmark. However, when the HI was reevaluated by segregating the constituents by critical effect/target organ, the recalculated HIs were all equal to or less than the benchmark of 1. As shown in **Table 5-19,** inhalation of vapors had a negligible contribution to the ELCR and HI (3×10^{-9} and 0.001, respectively).

As discussed for the hypothetical future adult resident, the elevated ELCR associated with exposure to groundwater is solely attributable to the metals detected in a single turbid sample, which are likely related to localized geology. Therefore, potential risk and hazard may be overstated.

Table 5-19 summarizes the results of the risk characterization step for Building 1549. Given that estimated risks and hazards from exposure to groundwater are likely driven by concentrations of arsenic, iron and cobalt that result from localized geological characteristics surrounding a single sample location, the calculated risks and hazards are within the generally acceptable limits for unrestricted use.

5.5 Uncertainty Analysis

Key uncertainties associated with the risk assessment include the use of conservative land and water use assumptions, the use of primarily default reasonable maximum exposure (RME) assumptions to assess potential exposure, and the use of maximum detected concentrations of metals in a filtered groundwater sample that was still visibly turbid even after filtration to assess potential exposure. These uncertainties primarily affect the risk characterization by overestimating risk, as discussed below.

Land and water use assumptions for this risk assessment were conservative. Although the area surrounding Buildings 1549, 1041 and 1034 is primarily paved, thereby substantially limiting potential for direct contact, default assumptions regarding direct contact with soil and inhalation of vapors/particulates have been included in the current exposure scenario for the site worker. This assumption may also be conservative for the hypothetical future site worker, if building demolition, construction and site re-grading does not occur. In addition, although groundwater use is unlikely to occur in the future, exposure to groundwater as a potable water supply has been evaluated for both hypothetical future site workers and residents in the risk assessment for conservatism and for risk management decision-making. The addition of these unlikely exposure pathways into the risk calculations likely contributes to an overestimate of actual exposure and risk for each of these receptors.

Due to changes in toxicity values selected by USEPA to generate the May 2009 RSLs, one additional constituent, 1,4-dioxane, would have been selected as a COPC for Building 1549 if the May 2009 RSLs had been used, since the maximum detected concentration of 1,4-dioxane in soil gas at Building 1549 (5.5 ug/m^3) is greater than the updated residential air RSL adjusted by a factor of 10 to 3.2 ug/m^3. However, this exceedance is marginal. Assuming a conservative building attenuation factor of 0.1, estimated ELCRs for the vapor intrusion pathway would be $3x10^{-7}$, $2x10^{-6}$ and $3x10^{-7}$ for the current and hypothetical future site worker, hypothetical future adult resident and hypothetical future child resident due to 1,4-dioxane. The inclusion of this as a COPC, therefore, would result in cumulative risks less than or equal to the target risk range for this pathway, and total cumulative risks across evaluated pathways would also remain within or below the target risk range. Estimated HIs would be over three orders of magnitude less than 1 for each receptor, and therefore, HIs would also be acceptable if this constituent were included, Given that attenuation factors calculated for Building 1549 are less than 0.1 (Appendix E), the estimated risks presented here are likely overestimates of potential risks and hazards from exposure to 1,4-dioxane from the vapor intrusion pathway.

Groundwater EPCs were estimated using the maximum detected concentrations of COPCs in filtered groundwater samples obtained from sample 1041HP020 (25-30). This sample was visibly turbid even after filtration and the presence of very fine colloidal particles in the sample are likely the reason for the slightly elevated metals that were detected. Metals concentrations in this filtered groundwater sample were marginally greater than background concentrations (e.g., arsenic was detected at 12 ug/L and background concentrations range between 1 and 10 ug/L) and consistent with sporadic detections of cobalt observed in groundwater across the site. Potential risks and hazards were driven by the presence of arsenic, cobalt and iron, however, these metals were not detected in the other filtered groundwater samples. Thus, the exclusion of this sample would result in potential risks and hazards that would be within the generally acceptable levels. Therefore, average long-term exposure may be significantly overstated by using maximum detected concentrations.

Primarily default values for RME were used to estimate exposure, consistent with USEPA guidance. Use of default values can reduce unwarranted variability in exposure assumptions used to perform risk assessments across different sites, but when available, site-specific values should be used instead of upper-end default values to prevent overestimation of exposure. Values specified in USEPA guidance documents are intentionally conservative to ensure that risks are not underestimated. Thus, they would likely lead to an overestimation of potential exposure and risk. Specific values are discussed below.

A soil adherence rate of 0.1 milligrams per square centimeter per day (mg/cm^2-day) was selected to evaluate the current and future hypothetical site worker, based on the description in the guidance for a groundskeeper with limited direct soil contact (USEPA, 2004b; 2002c). This value is likely to overestimate potential exposure for current site worker traversing the area, given that the area surrounding Buildings 1034, 1041 and 1549 is paved. However, it was selected to ensure that it would also be protective of future outdoor workers at the site in the event that pavement were to be removed or individuals engage in daily outdoor activities there.

5.6 Risk Assessment Summary

The risk assessment quantitatively evaluated current and future exposure to soil and soil gas under current/future industrial and future hypothetical residential land uses.

Under current and future land-use scenarios, the potential risks and hazards for the site worker, and hypothetical construction worker, and hypothetical residents were

within the USEPA target risk range ($1x10^{-4}$ to $1x10^{-6}$) or less than or equal to the benchmark hazard index threshold of 1, with the exception of exposure to groundwater. However, estimated risks and hazards from exposure to groundwater are driven by concentrations of arsenic, iron and cobalt that likely result from localized geology. Therefore, no unacceptable risks were identified.

It is also important to note that the carcinogenic risks and non-carcinogenic HI presented in this HHRA are based upon conservative default assumptions that are intended to be protective of human health by overestimating potential exposures and risks. Therefore, it is likely that the risks presented in this report are overstated, and actual risks are likely to be lower than those presented here.

The site is in an industrialized area. It does not provide a suitable habitat for ecological receptors.

6.0 Recommendations

Based on the data presented in this report, clean closure with no further action is recommended for Buildings 1034, 1041 and 1549. No further action is appropriate based on the following major findings:

- No potential ongoing sources were indentified and the hypothesis that one or more of the buildings is (or was formerly) a source of chlorinated VOCs to groundwater is not supported by the data. It was concluded using data gathered during this investigation and additional downgradient investigations that the source of the TCE in groundwater was HWMU 5, and that there is no evidence of TCE migrating from any potential upgradient source, specifically the buildings investigated under this RFI.

- There are no unacceptable risks at RAAP-47 for either industrial or the hypothetical future residential use scenarios, with the exception of the groundwater ingestion pathway under the future residential land use scenario. Based on the sampling information available for groundwater, the elevated risks and hazards due to this exposure pathway are likely due to the localized geological characteristics associated with a single groundwater sample that was still visibly turbid after filtration. Detectable concentrations of arsenic, cobalt and iron were present in this sample and were not detected in the other filtered groundwater samples that were collected from the site. Their presence is likely due to the very fine colloidal particles that were present in the filtered sample.

7.0 References

ARCADIS, U.S., Inc. (ARCADIS). 2008a. Internal Draft Health and Safety Plan Addendum, Radford Army Ammunition Plant. April.

ARCADIS, U.S., Inc. (ARCADIS). 2008b. Internal Draft Quality Assurance Plan Addendum, Radford Army Ammunition Plant. April.

ARCADIS, U.S., Inc. (ARCADIS). 2008c. Work Plan Addendum 25, RFI Work Plan RAAP-047, Radford Army Ammunition Plant. May.

ASTM International (ASTM). 1995. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. E 1739-95. West Conshohocken, PA.

Agency for Toxic Substances and Disease Registry. 2008. Minimal Risk Levels (MRLs). December. http://www.atsdr.cdc.gov/mrls.html.

California Environmental Protection Agency. 2009. Toxicity Criteria Database. Office of Environmental Health Hazard Assessment. http://oehha.ca.gov/risk/ChemicalDB/index.asp.

Cogliano, V.J. 1997. Plausible Upper Bounds: Are Their Sums Plausible? Risk Analysis, 17 (1): 77-84.

Draper Aden. 2007. Draft Alternate Source Demonstration for Trichloroethene, Hazardous Waste Management Unit 5, Radford Army Ammunition Plant, Radford, Virginia. April.

Draper Aden. 2008. 2007 Groundwater Monitoring Report Hazardous Waste Management Units 5 and 7, Radford Army Ammunition Plant, Radford Virginia. February.

IT. 2001. Final Facility Wide Background Study Report. Radford Army Ammunition Plant. December.

Johnson, P.C., and R.A. Ettinger, 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings. Environ. Sci. Technol., 25:8, pp. 1445-1452.

Oak Ridge National Laboratory (ORNL). 2008. Regional Screening Levels. May. http://epa-prgs.ornl.gov/chemicals/download.shtml

URS, 2003, Final Master Work Plan, Radford Army Ammunition Plant, Radford, Virginia. August.

U.S. Environmental Protection Agency (USEPA). 1986. Guidelines for Carcinogen Risk Assessment. Risk Assessment Forum, Washington, D.C. EPA/630/R-00/004. September.

U.S. Environmental Protection Agency (USEPA). 1989. Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Volume 1, Part A. Interim Final. Office of Emergency and Remedial Response, Washington, DC. EPA/540/1-89/002. December.

U.S. Environmental Protection Agency (USEPA). 1991. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual. Supplemental Guidance, "Standard Default Exposure Factors." Interim Final. Office of Emergency and Remedial Response, Washington, DC. OSWER Directive 9285.6-03. March 25.

U.S. Environmental Protection Agency (USEPA). 1997a. Exposure Factors Handbook. Exposure Assessment Group, Office of Research and Development. National Center for Environmental Assessment, Washington, DC. EPA 600/P-95-002. 002FA. August.

U.S. Environmental Protection Agency (USEPA). 1997b. Health Effects Assessment Summary Tables (HEAST), FY-1997 Update. Office of Research and Development and Office of Emergency and Remedial Response, Washington, DC. EPA/540/R-97/036. OERR 9200.6-303(97-1). NTIS No. PB97-921199. July.

U.S. Environmental Protection Agency (USEPA). 2001. Radford Army Ammunition Plant Site Screening Process, October 26.

U.S. Environmental Protection Agency (USEPA). 2002a. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). EPA530-D-02-004. November.

U.S. Environmental Protection Agency (USEPA). 2002b. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. December.

U.S. Environmental Protection Agency (USEPA). 2002c. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Emergency and Remedial Response, Washington, DC. OSWER 9355.4-24. December.

U.S. Environmental Protection Agency (USEPA). 2002d. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington DC. EPA 540-R-01-003. September.

U.S. Environmental Protection Agency (USEPA). 2004a. User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings. Office of Emergency and Remedial Response, Washington, DC. June 19.

U.S. Environmental Protection Agency (USEPA). 2004b. Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment, EPA/540/R-99/005. Office of Superfund Remediation and Technology Innovation, Washington, D.C., July.

U.S. Environmental Protection Agency (USEPA). 2007. ProUCL Version 4.0. Statistical Software to Compute Upper Confidence Limits of the Unknown Population Mean. Available at http://www.epa.gov/nerleds1/tsc/software. June.

U. S. Environmental Protection Agency (USEPA). 2008a. Regional Screening Levels. June. URL: http://epa-prgs.ornl.gov/chemicals/download.shtml

U.S. Environmental Protection Agency (USEPA). 2009a. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment), EPA-540-R-070-002. Office of Superfund Remediation and Technology Innovation, Washington, D.C., January.

U.S. Environmental Protection Agency (USEPA), 2009b. Integrated Risk Information System (IRIS). Office of Research and Development, National Center of Environmental Assessment (NCEA). Internet access: [http://www.epa.gov/iris].

United States Environmental Protection Agency. 2009c. Provisional Peer-Reviewed Toxicity Values (PPRTVs). Office of Research and Development, Superfund Health Risk Technical Support Center.

Virginia Department of Environmental Quality (VDEQ). 2008. Voluntary Remediation Program Risk Assessment Guidance. September. URL: http://www.deq.virginia.gov/vrprisk/raguide.html

Tables

Table 2-1. Summary of Completed Borings
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virgina

Location	Total Depth Advanced (feet bgs)	Soil Gas Sample Depth (ft bgs)	Soil Sample Interval (feet bgs)	Groundwater Sample Interval (feet bgs)	Location Description
Phase 1 Borings					
1041-A	6	6	NS	NS	Subslab gas point inside Building 1041
1041-1	28	4	0.5 - 1.5 7 - 8	24 - 28	West side of Building 1041, center.
1041-2	57	4	1 - 2 7 - 8	22 - 24	North side of Building 1041, center.
1041-3	24	4	0.5 - 1.5 7 - 8	20 - 24	East side of Building 1041, center.
1041-4	21	4	0- 1 7 - 8	17 - 21	South side of Building 1041, center.
1034-A	0.5	0.5	NS	NS	Subslab gas point inside Building 1034
1034-B	0.5	0.5	NS	NS	Subslab gas point inside Building 1034
1034-1	36	3.5	0.5 - 1.5 7 - 8	32 - 36 *	West side of Building 1034, center of south half.
1034-2	4	4	NS	NS	West of Building 1034, center of north half.
1034-4	8	3.5	0.5 - 1.5 5 - 6	NS	North side of Building, center, outside of doorway.
1034-6	22	4	0.5 - 1.5 7 - 8	NS	Northeast corner of Building 1034.
1034-7	8	4	0.5 - 1.5 7 - 8	NS	Southeast corner of Building 1034.
1034-8	22	4	0.5 - 1.5 4 - 5	NS	South side of Building 1034, center.
1549-A	0.5	0.5	NS	NS	Subslab gas point inside Building 1549
1549-1	32	5	0.5 - 1.5 7 - 8	28 - 32 *	West side of Building 1549
1549-3	49.5	5	0.5 - 1.5 5 - 6	23 - 27 *	North side of Building 1549, center of west half
1549-4	8	5	0.5 - 1.5 5 - 6	4 - 8 *	North side of Building 1549, center of east half.
1549-6	8	5	0.5 - 1.5 5 - 6	NS	East side of Building 1549.
1549-7	4	4	NS	NS	Approximatley 35 feet north of northwest corner of Building 1549
1549-8	30	3	NS	25-30 (SC)	Approximatley 35 feet north of northeast corner of Building 1549
Phase 2 Borings					
1041-1A	28	NS	NS	25 - 28 (SC)	Groundwater confirmation sample at 1041-1.
1041-6	1	NS	0.5 - 1	NS	PCB delineation sample; west of 1041-4
1041-7	1	NS	0.5 - 1	NS	PCB delineation sample; south of 1041-4
1041-8	1	NS	0.5 - 1	NS	PCB delineation sample; east of 1041-4
1041-9	10	NS	7 - 8	NS	Delineation sample; southeast of 1041-3.
1041-10	10	NS	7 - 8	NS	Delineation sample; east of 1041-3.
1041-11	10	NS	8 - 9	NS	Delineation sample; northeast of 1041-3.
1041-14	10	NS	6 - 7	NS	Delineation sample; southeast of 1041-3.
1041-15	20	NS	NS	15-20 (SC)	North side of street; westernmost point in transect.
1041-16	28.5	NS	NS	17-28 (SC)	South side of street; 2nd location from west in transect.
1041-17	34	NS	NS	22 - 25 30 - 33	South side of street; Center location in transect.
1041-18	38.5	NS	6 - 7	22 - 25 31 - 34	South side of street; 2nd location from east in transect.
1041-19	28.5	NS	6 - 7	18-28 (SC)	South side of street; easternmost point in transect.
Phase 3 Borings					
1041-20	30	NS	NS	25 - 30 (SC)	
1041-21	26	NS	NS	21 - 26 (SC)	
1549-9	29	NS	NS	19 - 29 (SC)	
1549-10	30	NS	NS	20 - 30 (SC)	

Notes:

SC = sample collected from temporary 5 ft or 10 ft screen PVC well; all other samples collected using a Hydropunch™ sampler.

NS = no sample collected

* Hydropunch screen interval set, but no water

Table 3-1. Summary of Analytical Data for Detected Compounds in Soil Gas at Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Shallow Soil Gas Screening - Residential	Shallow Soil Gas Screening - Industrial	Units	1034SG001 05/08/08	1034SG002 05/08/08	1034SG004 05/08/08	1034SG006 05/08/08	1034SG007 05/08/08	1034SG008 05/08/08	1034SLB00A 05/08/08	1034SLB00B 05/08/08
Volatile Organics											
1,1,1-Trichloroethane	5,200 {nc}	22,000 {nc}	ug/m3	<7.2	<7.3	4.0 J	<7.0	<7.0	<29	1.6 J	<5.3
1,2,4-Trimethylbenzene	7.3 {nc}	31 {nc}	ug/m3	**17**	<6.6	0.95 J	2.1 J	3.4 J	<26	<4.5	<4.8
1,3,5-Trimethylbenzene	- -	- -	ug/m3	14	<6.6	<6.5	<6.3	2.9 J	<26	<4.5	<4.8
1,3-Butadiene	0.81 {ca*}	4.1 {ca*}	ug/m3	**4.8**	**8.8**	**16**	**17**	**5.6**	**31**	<2.0	<2.2
2-Butanone	5,200 {nc}	22,000 {nc}	ug/m3	92	16	11	28	14	25	3.8	1.6 J
2-Hexanone	- -	- -	ug/m3	15 J	2.2 J	1.4 J	2.7 J	2.9 J	<87	1.0 J	<16
2-Propanol	- -	- -	ug/m3	5.9 J	<13	<13	3.3 J	5.6 J	<52	1.3 J	<9.6
4-Ethyltoluene	- -	- -	ug/m3	11	<6.6	<6.5	1.8 J	1.9 J	<26	<4.5	<4.8
4-Methyl-2-pentanone	3,100 {nc}	13,000 {nc}	ug/m3	7.5	1.4 J	0.86 J	1.8 J	1.4 J	<22	<3.7	<4.0
Acetone	320,000 {max}	1,400,000 {max}	ug/m3	620	97	52	280	68	120	16	7.9 J
Benzene	3.1 {ca*}	16 {ca*}	ug/m3	**4.3**	**5.1**	**7.9**	**18**	2.8 J	**15 J**	0.67 J	0.75 J
Bromodichloromethane	- -	- -	ug/m3	<8.8	21	<8.8	<8.6	<8.6	58	52	39
Bromomethane	5.2 {nc}	22 {nc}	ug/m3	<5.1	<5.2	<5.1	**5.7**	<5.0	<20	<3.6	<3.8
Carbon Disulfide	730 {nc}	3,100 {nc}	ug/m3	2.6 J	8	10	16	30	25	0.45 J	0.71 J
Carbon Tetrachloride	1.6 {ca}	8.2 {ca}	ug/m3	<8.3	<8.5	<8.3	<8.1	<8.1	**9.4 J**	<5.8	<6.2
Chloroform	1.1 {ca}	5.3 {ca}	ug/m3	**2.3 J**	**400**	**190**	<6.3	**54**	**8,800**	**940**	**650**
Chloromethane	14 {ca*}	68 {ca*}	ug/m3	2.6 J	<11	<11	6.3 J	<11	<44	<7.6	<8.1
Cyclohexane	6,300 {nc}	26,000 {nc}	ug/m3	6	2.0 J	<4.5	3.0 J	4.2 J	8.9 J	<3.1	<3.4
Dibromochloromethane	- -	- -	ug/m3	<11	<11	<11	<11	<11	<45	1.9 J	2.5 J
Dichlorodifluoromethane	210 {nc}	880 {nc}	ug/m3	<6.5	<6.6	<6.5	<6.4	<6.4	<26	5.3	7.8
Ethanol	- -	- -	ug/m3	36	23	6.4 J	14	3.8 J	7.0 J	2.7 J	<7.4
Ethylbenzene	9.7 {ca}	49 {ca}	ug/m3	2.4 J	2.6 J	1.3 J	2.9 J	<5.6	<23	<4.0	<4.2
Heptane	- -	- -	ug/m3	14	3.5 J	4.1 J	26	4.2 J	11 J	<3.7	<4.0
Hexane	730 {nc}	3,100 {nc}	ug/m3	9	6.8	<4.6	34	<4.5	16 J	<3.2	1.7 J
Isopropylbenzene	420 {nc}	1,800 {nc}	ug/m3	<6.5	<6.6	<6.5	<6.3	0.78 J	<26	<4.5	<4.8
m,p-Xylene	- -	- -	ug/m3	8.2	3.7 J	1.8 J	8	2.0 J	9.1 J	1.1 J	<4.2
Methylene Chloride	52 {ca}	260 {ca}	ug/m3	<4.6	1.8 J	<4.6	1.4 J	<4.5	21	2.1 J	5
n-Propylbenzene	- -	- -	ug/m3	<6.5	<6.6	<6.5	1.7 J	<6.3	<26	<4.5	<4.8
o-Xylene	730 {nc}	3,100 {nc}	ug/m3	2.6 J	2.1 J	1.3 J	2.8 J	2.3 J	4.6 J	<4.0	<4.2
Styrene	1,000 {nc}	4,400 {nc}	ug/m3	1.3 J	<5.7	1.2 J	3.1 J	<5.5	3.7 J	<3.9	<4.2
Tetrachloroethene	4.1 {ca}	21 {ca}	ug/m3	<9.0	<9.1	3.3 J	<8.8	**4.8 J**	<36	1.9 J	1.7 J
Tetrahydrofuran	- -	- -	ug/m3	3.6 J	3.4 J	<3.9	3.2 J	<3.8	12 J	<2.7	<2.9
Toluene	5,200 {nc}	22,000 {nc}	ug/m3	3.9 J	8.3	7.7	11	2.8 J	16 J	2.5 J	1.3 J
Trichloroethene	12 {ca}	61 {ca}	ug/m3	3.0 J	5.2 J	1.2 J	**22**	**13**	**17 J**	**17**	9.9
Trichlorofluoromethane	730 {nc}	3,100 {nc}	ug/m3	2.2 J	3.4 J	3.1 J	3.3 J	2.6 J	<30	1.7 J	2.0 J
Xylenes (total)	100 {nc}	440 {nc}	ug/m3	11 J	5.8 J	3.1 J	11 J	4.3 J	14 J	1.1 J	<4.2

Notes:

(a) USEPA (2008) redidential and industrial air Regional Screening Levels (RSLs) Following USEPA (2002) guidance, air RSLs were adjusted by a factor of 10 to account for attenuation from shallow soil gas and subslab soil gas to indoor air.

Bold - results detected above Residential Soil Shallow Soil Gas Screening

Shaded - results detected above Industrial Shallow Soil Gas Screening

Results in brackets [##] represent duplicate sample concentrations.

J - concentration is estimated

Region Screening Level Key

ca - RSL based on cancer endpoint

nc - RSL basedon non-cancer endpoint

max - RSL based on ceiling limit

sat - RSL based on saturation limit

ca* - where nc screening level < 100X ca screening level

ca** - where nc screening level < 10X ca screening level

Table 3-2. Summary of Laboratory Analytical Results for Detected Compounds in Soil at Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Adjusted Soil Screening Values-Industrial	Soil to Groundwater SSL (DAF 20)	Facility-Wide Background Values	Units	1034SB001 0.5 - 1.5 05/08/08	1034SB001 7 - 8 05/08/08	1034SB004 0.5 - 1.5 05/08/08	1034SB004 5 - 6 05/08/08	1034SB006 0.5 - 1.5 05/09/08	1034SB006 7 - 8 05/09/08	1034SB007 0.5 - 1.5 05/09/08	1034SB007 7 - 8 05/09/08	1034SB008 0.5 - 1.5 05/08/08	1034SB008 4 - 5 05/08/08
Volatile Organics														
Acetone	110,000 {sat}	88	- -	mg/kg	<0.011	<0.012	<0.017	<0.016	0.065 J [0.056 J]	<0.016	<0.012	<0.012	<0.013	<0.010
Carbon Disulfide	260 {sat}	5.4	- -	mg/kg	0.00032 J	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Chloroform	1.5 {ca}	0.0011	- -	mg/kg	<0.0056	*0.0058 J*	<0.0086	0.00084 J	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	*0.0042 J*
Chloromethane	8.4 {ca*}	0.0092	- -	mg/kg	<0.0056	<0.00061 B	<0.0086	<0.0082	0.00071 J [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Dichlorodifluoromethane	78 {nc}	12.2	- -	mg/kg	<0.0056	<0.0061	0.0044 J	0.0096	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	0.014	0.017
Methylcylohexane	71 {sat}	280	- -	mg/kg	0.00090 J	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Xylenes (total)	300 {sat}	220	- -	mg/kg	0.0012 J	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Semivolatile Organics														
Acenaphthene	3,300 {nc}	540	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.049
Acenaphthylene	3,300 {nc}	- -	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	0.40 J	0.64
Anthracene	170,000 {max}	9,000	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.30
Benzo(a)anthracene	2.1 {ca**}	0.28	- -	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	*1.8*	*2.6*
Benzo(a)pyrene	0.21 {ca**}	6.2	- -	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	3.0	4.0
Benzo(b)fluoranthene	2.1 {ca**}	0.94	- -	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	0.052 J	<0.15	*2.7*	*4.0 J*
Benzo(g,h,i)perylene	1,700 {nc}	- -	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	2.1 J	3.1
Benzo(k)fluoranthene	21 {ca**}	9.2	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	2.4 J	2.6
Caprolactam	310,000 {max}	114	- -	mg/kg	0.19 J	<0.45	0.19 J	<0.52	0.20 J [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Chrysene	210 {ca**}	28	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	2.3 J	3.0
Dibenzo(a,h)anthracene	0.21 {ca**}	0.3	- -	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	*2.2*	*1.2*
Dibenzofuran	- -	- -	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.033
Diethylphthalate	490,000 {max}	260	- -	mg/kg	<0.42	<0.45	<0.58	0.067	<0.42 [<0.43]	0.094	<0.41	0.054	<4.0	<0.39
Di-n-Butylphthalate	6,200 {nc}	220	- -	mg/kg	0.055 J	<0.45	0.056 J	<0.52	<0.042 B [<0.040 B]	<0.41	<0.047 B	<0.37	<4.0	<0.39
Fluoranthene	2,200 {nc}	4,200	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	3.3 J	4.7
Fluorene	2,200 {nc}	660	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.14
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	- -	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	2.8	2.3
Naphthalene	67 {nc}	0.48	- -	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.046
Pyrene	1,700 {nc}	3,000	- -	mg/kg	<0.42	<0.45 J	<0.58	<0.52 J	<0.42 [<0.43]	<0.41 J	<0.41	<0.37 J	3.9 J	5.3 J
Explosives														
None Detected	- -	- -	- -	- -	- -	- -	- -	- -	- - [- -]	- -	- -	- -	- -	- -
PCBs														
Aroclor-1254	0.74 {ca*}	0.102	- -	mg/kg	<0.021	<0.022	<0.029	<0.026	<0.020 [<0.021]	<0.020	0.048	<0.018	<0.020	<0.019
Aroclor-1260	0.74 {ca**}	0.28	- -	mg/kg	0.064	<0.022	<0.029	<0.026	<0.020 [<0.050 B]	<0.020	<0.0089 B	<0.018	0.012 J	0.024
Inorganics														
Aluminum	990,000 {max}	- -	40,041	mg/kg	33,300	**41,000**	**61,700**	34,000	**44,300 [32,200]**	14,600	29,000	12,600	29,700	12,800
Arsenic	1.6 {ca}	- -	15.8 {C}	mg/kg	3.40	1.90	10.1	4.40	4.10 [4.90]	3.80	1.60	4.30	4.00	11.7
Barium	190,000 {max}	- -	209 {N}	mg/kg	59.4	74.7	91.4	47.7	43.9 [66.1]	25.8	73.3	48.7	75.1	174
Beryllium	200 {nc}	- -	1.02 {N}	mg/kg	0.770 J	**1.10**	**1.60 J**	**2.30**	0.620 [0.740]	0.670	**1.10**	0.710	0.930 J	1.00
Cadmium	81 {nc}	- -	0.69 {N}	mg/kg	<1.30	0.310	<1.80	0.690	<1.30 J [0.320 J]	<1.20	<1.20	<1.10	<1.20	0.300
Calcium	- -	- -	- -	mg/kg	2,440 J	764	2,820 J	546	541 J [1,360 J]	<1,190	2,070 J	<1,090	6,100 J	771
Chromium	1,460 {ca**}	- -	65.3 {N}	mg/kg	37.7	47.4	46.4	25.1	37.5 [39.6]	45.0	59.1	30.1	36.2	13.7
Cobalt	30 {nc}	- -	72.3	mg/kg	8.20	8.00	10.2	34.5	3.90 [6.20]	5.50	11.0	10.4	11.6	10.8
Copper	4,100 {nc}	- -	53.5 {N}	mg/kg	20.1	28.8	**79.0**	29.7	11.7 J [39.9 J]	10.4	27.6	6.30	22.2	13.6
Iron	720,000 {max}	- -	50,962 {N}	mg/kg	46,800	47,600	**76,800**	49,500	50,200 [42,700]	25,300	**90,500**	23,500	48,100	49,300
Lead	750 { }	- -	26.8	mg/kg	14.3	20.7	**60.8**	**102**	15.2 [21.7]	8.10	**29.2**	4.50	15.7	4.60
Magnesium	- -	- -	- -	mg/kg	2,100 J	2,530	2,750 J	9,880	1,040 [1,290]	525	1,410	467	4,300 J	768
Manganese	2,300 {nc}	- -	2,543 {N}	mg/kg	214 J	164 J	108 J	979 J	59.4 J [276 J]	92.4 J	1,130	356 J	329 J	1,090 J
Mercury	3.1 {sat}	2	0.13	mg/kg	0.0450 J	0.0170 J	**0.490 J**	<0.0510 J	**0.250 [0.140]**	<0.0420 J	0.130	<0.0370 J	**0.350 J**	**0.250 J**
Nickel	2,000 {nc}	- -	62.8 {N}	mg/kg	13.5	19.9	26.1	30.3	11.1 [10.0]	9.80	11.7	10.1	15.4	10.5
Potassium	- -	- -	- -	mg/kg	1,270	2,210	1,950	6,270	922 [955]	598	1,010	549	1,670	735
Vanadium	520 {nc}	- -	108 {N}	mg/kg	73.9	101	**133**	76.0	81.7 [77.4]	39.5	89.1	27.2	76.8	37.1
Zinc	310,000 {max}	- -	202 {N}	mg/kg	36.6	56.3	149	182	25.0 J [82.7 J]	27.0	53.9	18.0	47.2	26.6

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
Bold - results detected above facility-wide background values
Italics - results detected above Protection of Groundwater SSL
Shaded - results detected above adjusted Industrial Soil RSL
Results in brackets [##] represent duplicate sample concentrations.
NA - parameter not analyzed
J - concentration is estimated

Region Screening Level Key
ca - RSL based on cancer endpoint
nc - RSL basedon non-cancer endpoint
max - RSL based on ceiling limit
sat - RSL based on saturation limit
ca* - where nc screening level < 100X ca screening level
ca** - where nc screening level < 10X ca screening level

Table 3-3. Summary of Laboratory Analytical Results for Detected Compounds in Soil Gas at Building 1041
RAAP-047 RFI, Report Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Shallow Soil Gas Screening - Residential	Shallow Soil Gas Screening - Industrial	Units	1041SG001 05/08/08	1041SG002 05/08/08	1041SG003 05/08/08	1041SG004 05/08/08	1041SLB00A 05/06/08
Volatile Organics								
1,1,1-Trichloroethane	5,200 {nc}	22,000 {nc}	ug/m3	3.5 J	5.9 J	480	<7.5	6.8
1,1-Dichloroethene	210 {nc}	880 {nc}	ug/m3	<5.0	<5.1	52	<5.5	<3.5
1,3-Butadiene	0.81 {ca*}	4.1 {ca*}	ug/m3	**29**	**20**	**24**	**37**	<2.0
2-Butanone	5,200 {nc}	22,000 {nc}	ug/m3	20	11	11	21	1.5 J
2-Hexanone	- -	- -	ug/m3	<21	1.5 J	<56	2.1 J	<15
2-Propanol	- -	- -	ug/m3	<12	0.99 J	<34	<14	0.96 J
4-Ethyltoluene	- -	- -	ug/m3	<6.2	<6.3	<17	1.6 J	<4.4
4-Methyl-2-pentanone	3,100 {nc}	13,000 {nc}	ug/m3	1.3 J	1.3 J	<14	<5.6	<3.7
Acetone	320,000 {max}	1,400,000 {max}	ug/m3	190	59	97	100	9.8
Benzene	3.1 {ca*}	16 {ca*}	ug/m3	**15**	**5.6**	**8.6 J**	**21**	<2.8
Bromomethane	5.2 {nc}	22 {nc}	ug/m3	3.9 J	<5.0	<13	<5.4	<3.5
Carbon Disulfide	730 {nc}	3,100 {nc}	ug/m3	20	4.6	9.4 J	25	1.3 J
Chloroform	1.1 {ca}	5.3 {ca}	ug/m3	**10**	**370**	**6.7 J**	**2.7 J**	**170**
Chloromethane	14 {ca*}	68 {ca*}	ug/m3	<10	<11	<28	2.2 J	<7.4
Cyclohexane	6,300 {nc}	26,000 {nc}	ug/m3	1.5 J	2.7 J	<12	3.0 J	<3.1
Dichlorodifluoromethane	210 {nc}	880 {nc}	ug/m3	2.4 J	3.5 J	<17	<6.8	3.3 J
Ethanol	- -	- -	ug/m3	23	4.6 J	8.4 J	11	1.4 J
Ethylbenzene	9.7 {ca}	49 {ca}	ug/m3	2.2 J	<5.6	<15	3.7 J	<3.9
Heptane	- -	- -	ug/m3	9.7	5.8	48	15	<3.7
Hexane	730 {nc}	3,100 {nc}	ug/m3	13	7.6	57	22	<3.2
m,p-Xylene	- -	- -	ug/m3	2.4 J	<5.6	1.9 J	4.6 J	<3.9
Methylene Chloride	52 {ca}	260 {ca}	ug/m3	<4.4	<4.5	4.2 J	<4.8	1.3 J
o-Xylene	730 {nc}	3,100 {nc}	ug/m3	1.5 J	0.98 J	3.4 J	2.4 J	<3.9
Styrene	1,000 {nc}	4,400 {nc}	ug/m3	2.0 J	<5.5	<15	2.4 J	<3.8
Tetrachloroethene	4.1 {ca}	21 {ca}	ug/m3	<8.6	**5.6 J**	**540**	<9.4	3.2 J
Tetrahydrofuran	- -	- -	ug/m3	2.7 J	<3.8	7.1 J	2.9 J	<2.6
Toluene	5,200 {nc}	22,000 {nc}	ug/m3	13	5.4	7.4 J	19	1.8 J
Trichloroethene	12 {ca}	61 {ca}	ug/m3	5.4 J	**18**	**3,300**	<7.4	**46**
Trichlorofluoromethane	730 {nc}	3,100 {nc}	ug/m3	<7.1	3.4 J	<19	<7.8	1.3 J
Xylenes (total)	100 {nc}	440 {nc}	ug/m3	3.9 J	0.98 J	5.3 J	7.0 J	<3.9

Notes:

(a) USEPA (2008) redidential and industrial air Regional Screening Levels (RSLs) Following USEPA (2002) guidance, air RSLs were adjusted by a factor of 10 to account for attenuation from shallow soil gas and subslab soil gas to indoor air.

Bold - results detected above Residential Soil Shallow Soil Gas Screening

Shaded - results detected above Industrial Shallow Soil Gas Screening

Results in brackets [##] represent duplicate sample concentrations.

J - concentration is estimated

Region Screening Level Key

ca - RSL based on cancer endpoint

nc - RSL basedon non-cancer endpoint

max - RSL based on ceiling limit

sat - RSL based on saturation limit

ca* - where nc screening level < 100X ca screening level

ca** - where nc screening level < 10X ca screening level

Table 3-4. Summary of Laboratory Analytical Results for Detected Compounds in Soil at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Adjusted Soil Screening Values-Industrial	Soil to Groundwater SSL (DAF 20)	Facility-Wide Background Values	Units	1041SB001 0.5 - 1.5 05/09/08	1041SB001 7 - 8 05/09/08	1041SB002 1 - 2 05/08/08	1041SB002 7 - 8 05/08/08	1041SB003 0.5 - 1.5 05/09/08	1041SB003 7 - 8 05/09/08	1041SB004 0 - 1 05/08/08	1041SB004 7 - 8 05/08/08	1041SB006 0.5 - 1 06/25/08
Volatile Organics													
Acetone	110,000 {sat}	88	- -	mg/kg	<0.011	<0.016	<0.011	<0.011	0.010 J	<0.015	<0.013	<0.016	NA
Chloroform	1.5 {ca}	0.0011	- -	mg/kg	<0.0056	<0.0080	<0.0053	*0.0063*	<0.0058	<0.0077	<0.0066	<0.0078	NA
Dichlorodifluoromethane	78 {nc}	12.2	- -	mg/kg	<0.0056	<0.0080	0.0030 J	<0.0054	<0.0058	<0.0077	0.0083	<0.0078	NA
Methylene Chloride	54 {ca}	0.026	- -	mg/kg	<0.0069 B	<0.020 B	<0.0098 B	<0.0065 B	<0.0093 B	<0.016 B	<0.0061 B	<0.014 B	NA
Toluene	930 {sat}	15.2	- -	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	0.00070 J	<0.0066	<0.0078	NA
Trichloroethene	14 {ca}	0.038	- -	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	0.0015 J	0.0011 J	<0.0066	<0.0078	NA
Semivolatile Organics													
bis(2-Ethylhexyl)phthalate	120 {ca*}	40	- -	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	0.051 J	<0.48	NA
Caprolactam	310,000 {max}	114	- -	mg/kg	0.14 J	0.11	0.14 J	<0.43	<0.41	0.15	0.16 J	<0.48	NA
Diethylphthalate	490,000 {max}	260	- -	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	0.12	0.045 J	<0.48	NA
Di-n-Butylphthalate	6,200 {nc}	220	- -	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	0.077 J	<0.48	NA
Explosives													
None Detected	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	NA
PCBs													
Aroclor-1254	0.74 {ca*}	0.102	- -	mg/kg	<0.021	<0.025	0.033	<0.021	<0.020	<0.025	*0.21*	<0.024	<0.020
Aroclor-1260	0.74 {ca**}	0.28	- -	mg/kg	<0.021	<0.025	0.028	<0.021	<0.020	<0.025	0.092	<0.024	<0.020
Inorganics													
Aluminum	990,000 {max}	- -	40,041	mg/kg	26,300	31,800	28,300	23,900	13,200	22,000	25,300	29,200	NA
Arsenic	1.6 {ca}	- -	15.8 {C}	mg/kg	4.20	1.60	3.50	3.70	1.30	<2.90	4.10	1.90	NA
Barium	190,000 {max}	- -	209 {N}	mg/kg	137	146	60.1	73.3	32.3	35.5	87.8	76.3	NA
Beryllium	200 {nc}	- -	1.02 {N}	mg/kg	**1.30**	**2.30**	0.740 J	0.830	0.410	**1.50**	0.820 J	**2.50**	NA
Cadmium	81 {nc}	- -	0.69 {N}	mg/kg	<1.20	0.540	<1.30	0.370	<1.20	<1.50	0.270 J	0.490	NA
Calcium	- -	- -	- -	mg/kg	7,110	994	6,490 J	5,080	16,600	645	1,420 J	653	NA
Chromium	1,460 {ca**}	- -	65.3 {N}	mg/kg	30.4	29.4	29.0	27.2	15.5	16.8	28.1	38.3	NA
Cobalt	30 {nc}	- -	72.3	mg/kg	37.3	25.5	9.90	12.4	6.50	8.00	9.80	13.3	NA
Copper	4,100 {nc}	- -	53.5 {N}	mg/kg	14.6	5.00	20.2	13.4	5.00	4.00	20.4	9.00	NA
Iron	720,000 {max}	- -	50,962 {N}	mg/kg	35,700	**60,500**	37,700	36,900	14,000	41,600	42,700	**60,900**	NA
Lead	750 { }	- -	26.8	mg/kg	19.1	2.00	13.3	10.2	6.20	1.90	**34.9**	2.50	NA
Magnesium	- -	- -	- -	mg/kg	4,830	8,030	3,450 J	3,890	9,670	1,470	1,480 J	7,190	NA
Manganese	2,300 {nc}	- -	2,543 {N}	mg/kg	**3,300**	1,530 J	276 J	538 J	449	487 J	715 J	893 J	NA
Mercury	3.1 {sat}	2	0.13	mg/kg	0.0770	<0.0510 J	0.130 J	0.0570 J	0.0350 J	<0.0480 J	**0.270 J**	<0.0410 J	NA
Nickel	2,000 {nc}	- -	62.8 {N}	mg/kg	17.4	30.7	12.4	12.2	5.80	14.5	11.9	24.7	NA
Potassium	- -	- -	- -	mg/kg	1,360	1,390	1,180	1,230	538	2,140	1,280	5,150	NA
Vanadium	520 {nc}	- -	108 {N}	mg/kg	54.2	45.3	57.9	49.9	17.5	29.0	59.4	67.4	NA
Zinc	310,000 {max}	- -	202 {N}	mg/kg	40.9	64.2	30.0	24.7	15.1	16.0	78.6	57.3	NA

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
Bold - results detected above facility-wide background values
Italics - results detected above Protection of Groundwater SSL
Shaded - results detected above adjusted Industrial Soil RSL
Results in brackets [##] represent duplicate sample concentrations.
J - concentration is estimated

Region Screening Level Key
ca - RSL based on cancer endpoint
nc - RSL basedon non-cancer endpoint
max - RSL based on ceiling limit
sat - RSL based on saturation limit
ca* - where nc screening level < 100X ca screening level
ca** - where nc screening level < 10X ca screening level

Table 3-4. Summary of Laboratory Analytical Results for Detected Compounds in Soil at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Adjusted Soil Screening Values-Industrial	Soil to Groundwater SSL (DAF 20)	Facility-Wide Background Values	Units	1041SB007 0.5 - 1 06/25/08	1041SB008 0.5 - 1 06/25/08	1041SB009 7 - 8 06/26/08	1041SB010 7 - 8 06/26/08	1041SB011 8 - 9 06/26/08	1041SB014 6 - 7 06/26/08	1041SB018 6 - 7 06/27/08	1041SB019 6 - 7 06/27/08
Volatile Organics												
Acetone	110,000 {sat}	88	- -	mg/kg	NA	NA	<0.014	<0.014	<0.014 [<0.014]	<0.014	<0.016	0.0034
Chloroform	1.5 {ca}	0.0011	- -	mg/kg	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	*0.0038 J*	<0.0057
Dichlorodifluoromethane	78 {nc}	12.2	- -	mg/kg	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Methylene Chloride	54 {ca}	0.026	- -	mg/kg	NA	NA	0.012	0.011	0.015 [0.011]	0.0098	0.0065	0.0049
Toluene	930 {sat}	15.2	- -	mg/kg	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Trichloroethene	14 {ca}	0.038	- -	mg/kg	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Semivolatile Organics												
bis(2-Ethylhexyl)phthalate	120 {ca*}	40	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	310,000 {max}	114	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	490,000 {max}	260	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-Butylphthalate	6,200 {nc}	220	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Explosives												
None Detected	- -	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
PCBs												
Aroclor-1254	0.74 {ca*}	0.102	- -	mg/kg	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.74 {ca**}	0.28	- -	mg/kg	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Inorganics												
Aluminum	990,000 {max}	- -	40,041	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.6 {ca}	- -	15.8 {C}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Barium	190,000 {max}	- -	209 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	200 {nc}	- -	1.02 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	81 {nc}	- -	0.69 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	1,460 {ca**}	- -	65.3 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	30 {nc}	- -	72.3	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Copper	4,100 {nc}	- -	53.5 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Iron	720,000 {max}	- -	50,962 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Lead	750 { }	- -	26.8	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	2,300 {nc}	- -	2,543 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	3.1 {sat}	2	0.13	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	2,000 {nc}	- -	62.8 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	520 {nc}	- -	108 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	310,000 {max}	- -	202 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
Bold - results detected above facility-wide background values
Italics - results detected above Protection of Groundwater SSL
Shaded - results detected above adjusted Industrial Soil RSL
Results in brackets [##] represent duplicate sample concentrations.
J - concentration is estimated

Region Screening Level Key
ca - RSL based on cancer endpoint
nc - RSL basedon non-cancer endpoint
max - RSL based on ceiling limit
sat - RSL based on saturation limit
ca* - where nc screening level < 100X ca screening level
ca** - where nc screening level < 10X ca screening level

Table 3-5. Summary of Laboratory Analytical Results for Detected Compounds in Groundwater at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(): Filtered or Unfiltered: Date Collected:	Tap Water Screening Values	MCL	HWMU-5 Calculated Background Values	Units	1041HP001 unfiltered 05/09/08	1041HP001A unfiltered 06/29/08	1041HP002 unfiltered 05/08/08	1041HP003 unfiltered 05/09/08	1041HP004 unfiltered 05/09/08	1041HP015 unfiltered 06/27/08	1041HP016 17 - 28 unfiltered 06/27/08	1041HP017 22 - 25 unfiltered 06/27/08	1041HP017 30 - 33 unfiltered 06/27/08	1041HP018 22 - 25 unfiltered 06/27/08	1041HP018 31 - 34 unfiltered 06/27/08	1041HP019 18 - 28 unfiltered 06/30/08
Volatile Organics																
2-Butanone	7,100 {nc}	- -	- -	ug/L	<10	NA	<10	<10	<10	8.7 J	<10	<10	<10	<10 [<10]	<10	<10
Acetone	22,000 {nc}	- -	- -	ug/L	3.8 J	NA	<10	2.8 J	<10	45	1.4	15	13	9.7 [8.6]	19	2.7
Chloroform	0.19 {ca}	80	- -	ug/L	35	NA	42	42	44	1.1	51	38	52	38 [37]	48	31
Trichloroethene	1.7 {ca}	5	- -	ug/L	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 [<1.0]	0.32 J	<1.0
Semivolatile Organics																
None Detected	- -	- -	- -	- -	- -	NA	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA
Explosives																
None Detected	- -	- -	- -	- -	- -	NA	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA
PCBs																
Aroclor-1260	0.034 {ca**}	0.5	- -	ug/L	*1.8*	<0.50	<0.53	<0.48	<0.48	NA	NA	NA	NA	NA	NA	NA
Inorganics																
Aluminum	37,000 {nc}	- -	- -	ug/L	53,800	NA	2,120	32,000	12,000	NA	NA	NA	NA	NA	NA	NA
Antimony	15 {nc}	6	3	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.045 {ca}	10	1	ug/L	***16.8***	NA	1.00 J	***27.6***	**5.80 J**	NA	NA	NA	NA	NA	NA	NA
Barium	7,300 {nc}	2,000	173	ug/L	**618**	NA	36.6	**226**	80.3	NA	NA	NA	NA	NA	NA	NA
Beryllium	73 {nc}	4	0.7	ug/L	***4.90 J***	NA	0.330 J	***4.40 J***	<5.00	NA	NA	NA	NA	NA	NA	NA
Cadmium	18 {nc}	5	1.45	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	- -	- -	- -	ug/L	23,500	NA	17,500	18,800	27,000	NA	NA	NA	NA	NA	NA	NA
Chromium	- -	100	- -	ug/L	*139*	NA	4.70	*144*	38.4	NA	NA	NA	NA	NA	NA	NA
Cobalt	- -	- -	7	ug/L	**55.0**	NA	3.10 J	**129**	5.30 J	NA	NA	NA	NA	NA	NA	NA
Copper	1,500 {nc}	1,300	18	ug/L	**95.2**	NA	10.8	**222**	<25.0	NA	NA	NA	NA	NA	NA	NA
Iron	26,000 {nc}	- -	- -	ug/L	170,000	NA	6,230	205,000	25,000	NA	NA	NA	NA	NA	NA	NA
Lead	- -	15	10	ug/L	**14.3**	NA	1.10 J	***43.0***	5.40	NA	NA	NA	NA	NA	NA	NA
Magnesium	- -	- -	- -	ug/L	37,100	NA	7,740	18,600	23,800	NA	NA	NA	NA	NA	NA	NA
Manganese	880 {nc}	- -	- -	ug/L	4,490	NA	148	3,740	301	NA	NA	NA	NA	NA	NA	NA
Mercury	0.63 {nc}	2	0.9	ug/L	<0.200	NA	<0.200	<0.200	0.230	NA	NA	NA	NA	NA	NA	NA
Nickel	730 {nc}	- -	106	ug/L	**171**	NA	3.20	**205**	30.6	NA	NA	NA	NA	NA	NA	NA
Potassium	- -	- -	- -	ug/L	16,100	NA	2,530	16,200	4,280 J	NA	NA	NA	NA	NA	NA	NA
Selenium	180 {nc}	50	1	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	180 {nc}	- -	2.3	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	- -	- -	- -	ug/L	15,400	NA	11,400	13,300	13,000	NA	NA	NA	NA	NA	NA	NA
Thallium	2.4 {nc}	2	2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	180 {nc}	- -	17	ug/L	**109**	NA	6.50 J	**246**	**27.2 J**	NA	NA	NA	NA	NA	NA	NA
Zinc	11,000 {nc}	- -	75	ug/L	**226**	NA	8.50	**210**	26.4	NA	NA	NA	NA	NA	NA	NA
Field Parameters																
pH	--	--	2.79 - 7.47	SU	NA	6.72	NA	NA	NA	6.86	6.87	6.61	6.01	6.2	6.04	4.61
Conductivity	--	--	0.450	mS/cm	NA	0.340	NA	NA	NA	0.366	0.249	0.214	0.268	0.178	0.210	0.175
Turbidity	--	--	--	NTU	NA	8.9	NA	NA	NA	>800	>800	293	>800	>800	>800	>1100

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
Shaded - results detected above Tap Water RSL
Italics - results detected above MCL
Bold - results detected above HWMU-5 calculated background values
Results in brackets [##] represent duplicate sample concentrations.
NA - parameter not analyzed
J - concentration is estimated
filtered samples field filtered through 0.45 micron filter

Region Screening Level Key
ca - RSL based on cancer endpoint
nc - RSL basedon non-cancer endpoint
max - RSL based on ceiling limit
ca* - where nc screening level < 100X ca screening level
ca** - where nc screening level < 10X ca screening level

Region Screening Level Key
ca - RSL based on cancer endpoint
nc - RSL basedon non-cancer endpoint
max - RSL based on ceiling limit
ca* - where nc screening level < 100X ca screening level

Table 3-5. Summary of Laboratory Analytical Results for Detected Compounds in Groundwater at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(): Filtered or Unfiltered: Date Collected:	Tap Water Screening Values	MCL	HWMU-5 Calculated Background Values	Units	1041HP020 25 - 30 unfiltered 07/08/09	1041HP020 25 - 30 filtered 07/08/09	1041HP021 21 - 26 unfiltered 07/08/09	1041HP021 21 - 26 filtered 07/08/09
Volatile Organics								
2-Butanone	7,100 {nc}	- -	- -	ug/L	NA	NA	NA	NA
Acetone	22,000 {nc}	- -	- -	ug/L	NA	NA	NA	NA
Chloroform	0.19 {ca}	80	- -	ug/L	NA	NA	NA	NA
Trichloroethene	1.7 {ca}	5	- -	ug/L	NA	NA	NA	NA
Semivolatile Organics								
None Detected	- -	- -	- -	- -	NA	NA	NA	NA
Explosives								
None Detected	- -	- -	- -	- -	NA	NA	NA	NA
PCBs								
Aroclor-1260	0.034 {ca**}	0.5	- -	ug/L	NA	NA	NA	NA
Inorganics								
Aluminum	37,000 {nc}	- -	- -	ug/L	349000	13100	1090000 [1020000]	< 200 [< 200]
Antimony	15 {nc}	6	3	ug/L	< 150	< 15	< 150 [< 150]	< 15 [< 15]
Arsenic	0.045 {ca}	10	1	ug/L	***124***	***12.9***	***188 [157]***	< 10 [< 10]
Barium	7,300 {nc}	2,000	173	ug/L	***4220***	***184***	***6420 [5880]***	*52.9 [53.8]*
Beryllium	73 {nc}	4	0.7	ug/L	***42***	**1.4 J**	***54.4 [50.7]***	< 5 [< 5]
Cadmium	18 {nc}	5	1.45	ug/L	***10.2 UB***	< 5	***14.6 J [16.8 J]***	< 5 [< 5]
Calcium	- -	- -	- -	ug/L	67200 J	18800 J	348000 J [317000 J]	20900 J [20600 J]
Chromium	- -	100	- -	ug/L	*716*	24	*2720 [2520]*	< 10 [< 10]
Cobalt	- -	- -	7	ug/L	**1080**	**33**	**1090 [994]**	< 15 [< 15]
Copper	1,500 {nc}	1,300	18	ug/L	***1040***	***37***	***852 [826]***	< 10 [< 10]
Iron	26,000 {nc}	- -	- -	ug/L	2000000	82600 J	2570000 [2330000]	< 100 [< 100]
Lead	- -	15	10	ug/L	***220***	7.5	***230 [219]***	< 3 [< 3]
Magnesium	- -	- -	- -	ug/L	186000	13000	823000 [747000]	11400 [11400]
Manganese	880 {nc}	- -	- -	ug/L	57800 J	2180	41300 J [37800 J]	133 [130]
Mercury	0.63 {nc}	2	0.9	ug/L	0.47	< 0.2	0.52 [0.47]	< 0.2 [< 0.2]
Nickel	730 {nc}	- -	106	ug/L	**2340**	83.5	**3220 [2860]**	< 10 [3.8 J]
Potassium	- -	- -	- -	ug/L	23700	8210	134000 [128000]	6840 [6960]
Selenium	180 {nc}	50	1	ug/L	< 50	< 5	< 50 [< 50]	< 5 [< 5]
Silver	180 {nc}	- -	2.3	ug/L	< 100	< 10	< 100 [< 100]	< 10 [< 10]
Sodium	- -	- -	- -	ug/L	20700 J	19400	15500 J [16000 J]	14800 [15100]
Thallium	2.4 {nc}	2	2	ug/L	< 100	< 10	< 100 [< 100]	< 10 [< 10]
Vanadium	180 {nc}	- -	17	ug/L	**1390**	**53**	**2700 [2510]**	< 10 [< 10]
Zinc	11,000 {nc}	- -	75	ug/L	**1800**	61.3	**2190 [1950]**	< 20 [< 20]
Field Parameters								
pH	--	--	2.79 - 7.47	SU	NA	NA	NA	NA
Conductivity	--	--	0.450	mS/cm	NA	NA	NA	NA
Turbidity	--	--	--	NTU	>1100	NA	>1100	NA

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
Shaded - results detected above Tap Water RSL
Italics - results detected above MCL
Bold - results detected above HWMU-5 calculated background values
Results in brackets [##] represent duplicate sample concentrations.
NA - parameter not analyzed
J - concentration is estimated
filtered samples field filtered through 0.45 micron filter

Table 3-6. Summary of Laboratory Analytical Results for Detected Compounds in Soil Gas at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Date Collected:	Shallow Soil Gas Screening - Residential	Shallow Soil Gas Screening - Industrial	Units	1549SG001 05/07/08	1549SG003 05/07/08	1549SG004 05/07/08	1549SG006 05/07/08	1549SG007 05/07/08	1549SG008 05/07/08	1549SLB00A 05/06/08
Volatile Organics										
1,1,1-Trichloroethane	5,200 {nc}	22,000 {nc}	ug/m3	<7.0	<6.9	3.1 J	<7.2	<7.9	<7.3	<6.3
1,1-Dichloroethane	15 {ca}	77 {ca}	ug/m3	<5.2	<5.1	2.0 J	<5.3	<5.8	<5.4	<4.6
1,2,4-Trimethylbenzene	7.3 {nc}	31 {nc}	ug/m3	1.2 J	3.2 J	**7.8**	<6.5	1.5 J	**110**	4.2 J
1,2-Dichlorobenzene	210 {nc}	880 {nc}	ug/m3	5.4 J	<7.6	7.9 J	<7.9	<8.7	<8.1	<6.9
1,3,5-Trimethylbenzene	- -	- -	ug/m3	<6.3	2.0 J	<7.3	<6.5	<7.1	94	2.6 J
1,3-Butadiene	0.81 {ca*}	4.1 {ca*}	ug/m3	**10**	**12**	**10**	**12**	**14**	**43**	<2.5
1,3-Dichlorobenzene	- -	- -	ug/m3	0.87 J	<7.6	<8.9	<7.9	<8.7	<8.1	<6.9
1,4-Dichlorobenzene	2.2 {ca}	11 {ca}	ug/m3	**3.2 J**	<7.6	**2.5 J**	<7.9	<8.7	<8.1	<6.9
1,4-Dioxane	3,800 {nc}	16,000 {nc}	ug/m3	<18	<18	5.5 J	<19	<21	<19	<16
2,2,4-Trimethylpentane	- -	- -	ug/m3	<6.0	<5.9	<6.9	<6.2	<6.8	180	<5.4
2-Butanone	5,200 {nc}	22,000 {nc}	ug/m3	82	40	89	100	33	62	4
2-Hexanone	- -	- -	ug/m3	6.8 J	<21	11 J	15 J	2.3 J	<22	<19
2-Propanol	- -	- -	ug/m3	<13	4.1 J	17	8.6 J	<14	3.6 J	0.76 J
4-Ethyltoluene	- -	- -	ug/m3	<6.3	2.7 J	6.0 J	1.0 J	1.6 J	54	2.2 J
4-Methyl-2-pentanone	3,100 {nc}	13,000 {nc}	ug/m3	4.8 J	4.2 J	8.5	10	2.1 J	<5.5	<4.7
Acetone	320,000 {max}	1,400,000 {max}	ug/m3	370	260	720	500	120	260	48
Benzene	3.1 {ca*}	16 {ca*}	ug/m3	**5.8**	**7.9**	**7.7**	**9.5**	**8.2**	**34**	1.3 J
Carbon Disulfide	730 {nc}	3,100 {nc}	ug/m3	2.0 J	2.8 J	9.3	<4.1	12	16	1.5 J
Chloromethane	14 {ca*}	68 {ca*}	ug/m3	<11	<10	4.2 J	<11	<12	<11	<9.5
cis-1,2-Dichloroethene	- -	- -	ug/m3	<5.1	<5.0	29	<5.2	<5.7	<5.3	<4.6
Cyclohexane	6,300 {nc}	26,000 {nc}	ug/m3	<4.4	34	22	1.5 J	1.4 J	56	0.73 J
Dichlorodifluoromethane	210 {nc}	880 {nc}	ug/m3	<6.4	3.0 J	<7.3	2.6 J	<7.1	2.8 J	1.6 J
Ethanol	- -	- -	ug/m3	120	49	90	21	6.1 J	7.4 J	<8.7
Ethylbenzene	9.7 {ca}	49 {ca}	ug/m3	<5.6	3.8 J	2.9 J	2.2 J	3.2 J	**9.8**	4.4 J
Heptane	- -	- -	ug/m3	<5.2	18	50	16	6.8	64	1.9 J
Hexane	730 {nc}	3,100 {nc}	ug/m3	<4.5	<4.4	30	<4.6	<5.1	61	2.8 J
Isopropylbenzene	420 {nc}	1,800 {nc}	ug/m3	<6.3	1.1 J	1.3 J	<6.5	1.0 J	10	<5.6
m,p-Xylene	- -	- -	ug/m3	1.3 J	8.3	5.8 J	3.4 J	3.0 J	28	17
Methyl tert-butyl ether	94 {ca}	470 {ca}	ug/m3	<4.6	<4.6	<5.3	<4.8	<5.2	42	<4.1
Methylene Chloride	52 {ca}	260 {ca}	ug/m3	<4.5	1.1 J	2.0 J	<4.6	<5.0	1.0 J	1.2 J
n-Propylbenzene	- -	- -	ug/m3	<6.3	1.4 J	2.0 J	<6.5	<7.1	16	1.1 J
o-Xylene	730 {nc}	3,100 {nc}	ug/m3	0.70 J	5.5	4.9 J	1.8 J	1.9 J	29	7.7
Styrene	1,000 {nc}	4,400 {nc}	ug/m3	0.82 J	1.9 J	1.3 J	1.9 J	1.4 J	<5.7	<4.9
Tetrachloroethene	4.1 {ca}	21 {ca}	ug/m3	<8.8	<8.6	4.1 J	<9.0	<9.8	<9.1	<7.8
Tetrahydrofuran	- -	- -	ug/m3	15	<3.7	4.1 J	<3.9	<4.3	<4.0	1.8 J
Toluene	5,200 {nc}	22,000 {nc}	ug/m3	4.1 J	9.7	7.1	11	6.9	37	2.4 J
Trichloroethene	12 {ca}	61 {ca}	ug/m3	<6.9	3.7 J	3.6 J	<7.1	<7.8	<7.2	<6.2
Trichlorofluoromethane	730 {nc}	3,100 {nc}	ug/m3	1.5 J	1.7 J	7.1 J	<7.4	4.5 J	2.0 J	1.9 J
Xylenes (total)	100 {nc}	440 {nc}	ug/m3	2.0 J	14	11 J	5.2 J	4.9 J	57	25

Notes:

(a) USEPA (2008) redidential and industrial air Regional Screening Levels (RSLs) Following USEPA (2002) guidance, air RSLs were adjusted by a factor of 10 to account for attenuation from shallow soil gas and subslab soil gas to indoor air.

Bold - results detected above Residential Soil Shallow Soil Gas Screening

Shaded - results detected above Industrial Shallow Soil Gas Screening

Results in brackets [##] represent duplicate sample concentrations.

J - concentration is estimated

Region Screening Level Key

ca - RSL based on cancer endpoint

nc - RSL basedon non-cancer endpoint

max - RSL based on ceiling limit

sat - RSL based on saturation limit

ca* - where nc screening level < 100X ca screening level

ca** - where nc screening level < 10X ca screening level

Table 3-7. Summary of Laboratory Analytical Results for Detected Compounds in Soil at Building 1549
RAAP-047 RFI Report, Radford Army Ammunititon Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Adjusted Soil Screening Values-Industrial	Soil to Groundwater SSL (DAF 20)	Facility-Wide Background Values	Units	1549SB001 0.5 - 1.5 05/07/08	1549SB001 7 - 8 05/07/08	1549SB003 0.5 - 1.5 05/07/08	1549SB003 5 - 6 05/07/08	1549SB004 0.5 - 1.5 05/07/08	1549SB004 5 - 6 05/07/08	1549SB006 0.5 - 1.5 05/07/08	1549SB006 5 - 6 05/07/08
Volatile Organics												
2-Butanone	28,000 {sat}	30	- -	mg/kg	<0.012	<0.012	0.0053 J [<0.013]	0.010 J	<0.0094	0.036 J	0.0036 J	0.0053 J
Acetone	110,000 {sat}	88	- -	mg/kg	0.022	0.035	0.044 [0.033]	0.034	0.017	0.14	0.027	<0.010
Carbon Disulfide	260 {sat}	5.4	- -	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	0.00036 J	<0.0051	0.00048 J
Dichlorodifluoromethane	78 {nc}	12.2	- -	mg/kg	0.012	0.00098 J	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Methylcylohexane	71 {sat}	280	- -	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	0.00034 J	<0.0057	<0.0051	<0.0052
Toluene	930 {sat}	15.2	- -	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	0.00044 J	<0.0051	<0.0052
Semivolatile Organics												
Caprolactam	310,000 {max}	114	- -	mg/kg	<0.44	<0.39	0.10 J [<0.14 J]	<0.38	0.14 J	<0.42	0.12 J	<0.42
Di-n-Butylphthalate	6,200 {nc}	220	- -	mg/kg	<0.44	<0.39	0.043 J [<0.42 J]	<0.38	0.042 J	<0.42	<0.42	<0.42
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	- -	mg/kg	0.18	<0.16	<0.17 [<0.17 J]	<0.15	<0.16	<0.17	<0.17	<0.17
Explosives												
Nitroglycerine	6.2 {nc}	0.034	- -	mg/kg	<5	<5	<5 *[2.5 J]*	<10	<5	<5	<5	<5
PCBs												
Aroclor-1254	0.74 {ca*}	0.102	- -	mg/kg	0.093	<0.020	<0.022 J [0.095 J]	<0.019	<0.020	0.021	<0.021	<0.020
Aroclor-1260	0.74 {ca**}	0.28	- -	mg/kg	<0.022	<0.020	<0.022 J [0.16 J]	<0.019	<0.020	<0.021	<0.021	<0.020
Inorganics												
Aluminum	990,000 {max}	- -	40,041	mg/kg	35,400	15,000	33,000 **[40,700]**	7,080	26,200	21,500	27,100	27,100
Arsenic	1.6 {ca}	- -	15.8 {C}	mg/kg	6.7	1.7	4.70 [5.30]	1.5	2.9	4.1	5.8	5.2
Barium	190,000 {max}	- -	209 {N}	mg/kg	70.1	41.6	80.6 [60.3]	59.9	56.9	68.7	82.9	78.8
Beryllium	200 {nc}	- -	1.02 {N}	mg/kg	**1.70 J**	0.23	1.00 J [0.610 J]	0.36	0.470 J	0.78	**1.20 J**	**1.2**
Cadmium	81 {nc}	- -	0.69 {N}	mg/kg	<1.30	0.26	<1.30 [<1.30]	<1.10	<1.20	0.54	<1.20	0.64
Calcium	- -	- -	- -	mg/kg	3,550 J	320	6,620 J [1,140 J]	1,560	3,280 J	16,000	9,460 J	953
Chromium	1,460 {ca**}	- -	65.3 {N}	mg/kg	35.3	19.8	33.8 [40.0]	10	31.7	25.8	31.7	35.5
Cobalt	30 {nc}	- -	72.3	mg/kg	11.8	1.7	8.40 J [3.40 J]	3.4	6	8.8	9.8	10.1
Copper	4,100 {nc}	- -	53.5 {N}	mg/kg	23.3	5.1	17.2 [19.5]	3.5	11.7	29.5	14.9	20
Iron	720,000 {max}	- -	50,962 {N}	mg/kg	42,100	19,400	35,100 **[53,100]**	7,490	30,400	25,100	30,300	34,500
Lead	750 { }	- -	26.8	mg/kg	16.4	10.2	15.4 [15.0]	11.2	13.6	**62.2**	15.8	13.4
Magnesium	- -	- -	- -	mg/kg	5,690 J	654	6,480 J [1,180 J]	980	2,160 J	10,600	8,230 J	3,890
Manganese	2,300 {nc}	- -	2,543 {N}	mg/kg	258 J	83.6 J	347 J [143 J]	201 J	457 J	341 J	154 J	147 J
Mercury	3.1 {sat}	2	0.13	mg/kg	0.0800 J	0.0540 J	0.0610 J [0.130 J]	<0.0360 J	0.0630 J	0.0690 J	0.0410 J	0.0650 J
Nickel	2,000 {nc}	- -	62.8 {N}	mg/kg	23.2	3.1	15.4 [10.8]	2.5	8.3	11.6	16.8	17.5
Potassium	- -	- -	- -	mg/kg	2,640	559	1,680 [1,030]	301	835	1,200	1,940	1,970
Selenium	510 {nc}	- -	- -	mg/kg	<1.30	<1.10	<1.30 [<1.30]	<1.10	0.880 J	<1.30	<1.20	<1.20
Sodium	- -	- -	- -	mg/kg	<1,290	<1,140	<1,270 J [275 J]	<1,140	272	<1,270	312	<1,240
Vanadium	520 {nc}	- -	108 {N}	mg/kg	67.5	41.2	65.6 [99.5]	19.8	60.5	47.8	55.6	59.7
Zinc	310,000 {max}	- -	202 {N}	mg/kg	44.1	16.7	37.3 [41.7]	14.3	26.3	40.4	39.8	28.4

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
Bold - results detected above facility-wide background values
Italics - results detected above Protection of Groundwater SSL
Shaded - results detected above adjusted Industrial Soil RSL
Results in brackets [##] represent duplicate sample concentrations.
J - concentration is estimated

Region Screening Level Key
ca - RSL based on cancer endpoint
nc - RSL basedon non-cancer endpoint
max - RSL based on ceiling limit
sat - RSL based on saturation limit
ca* - where nc screening level < 100X ca screening level
ca** - where nc screening level < 10X ca screening level

Table 3-8. Summary of Laboratory Analytical Results Groundwater at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(): Filtered or Unfiltered: Date Collected:	Tapwater Screening Values	MCL	HWMU-5 Calculated Background Values	Units	1549 HP008 unfiltered 05/10/08	1549 HP009 19 - 29 unfiltered 07/08/09	1549 HP009 19 - 29 filtered 07/08/09	1549 HP010 20 - 30 unfiltered 07/08/09	1549 HP010 20 - 30 filtered 07/08/09
Volatile Organics									
None Detected	- -	- -	- -	- -	- -	- -	- -	- -	- -
Explosives									
None Detected	- -	- -	- -	- -	- -	- -	- -	- -	- -
PCBs									
None Detected	- -	- -	- -	- -	- -	- -	- -	- -	- -
Inorganics									
Aluminum	37,000 {nc}	- -	- -	ug/L	179,000	3600000	< 200	1460000	< 200
Antimony	15 {nc}	6	3	ug/L	NA	< 750	< 15	< 150	< 15
Arsenic	0.045 {ca}	10	1	ug/L	***35.0***	***1380***	< 10	***935***	< 10
Barium	7,300 {nc}	2,000	173	ug/L	**507**	***11500***	*96.5*	***5320***	*84.4*
Beryllium	73 {nc}	4	0.7	ug/L	***6.60***	***212***	< 5	***102***	< 5
Cadmium	18 {nc}	5	1.45	u	NA	***123 J***	< 5	***21.7 J***	< 5
Calcium	- -	- -	- -	ug/L	34,300	530000 J	60200 J	212000 J	71100 J
Chromium	- -	100	- -	ug/L	*150*	*5070*	< 10	*1690*	< 10
Cobalt	- -	- -	7	ug/L	**213**	**2960**	< 15	**1090**	< 15
Copper	1,500 {nc}	1,300	18	ug/L	**113**	***4890***	< 10	***2450***	< 10
Iron	26,000 {nc}	- -	- -	ug/L	197,000	6150000	< 100	3530000	< 100
Lead	- -	15	10	ug/L	***90.5***	***2100***	< 3	***786***	< 3
Magnesium	- -	- -	- -	ug/L	26,800	2780000	28600	1080000	29900
Manganese	880 {nc}	- -	- -	ug/L	7,660	95700 J	164	69100 J	172
Mercury	0.63 {nc}	2	0.9	ug/L	0.360	***5***	< 0.2	***2.6***	< 0.2
Nickel	730 {nc}	- -	106	ug/L	87.5	**6390**	3.8 J	**3050**	< 10
Potassium	- -	- -	- -	ug/L	11,000	180000	3570 J	55800	3380 J
Selenium	180 {nc}	50	1	ug/L	NA	< 250	< 5	< 50	< 5
Silver	180 {nc}	- -	2.3	ug/L	NA	< 500	< 10	< 100	< 10
Sodium	- -	- -	- -	ug/L	11,900	30200 J	21600	13300 J	11900
Thallium	2.4 {nc}	2	2	ug/L	NA	< 500	< 10	< 100	< 10
Vanadium	180 {nc}	- -	17	ug/L	**353**	**5950**	< 15	**2930**	< 15
Zinc	11,000 {nc}	- -	75	ug/L	**387**	**4990**	< 20	**12300**	8.4 UB

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
Shaded - results detected above Tap Water RSL
Italics - results detected above MCL
Bold - results detected above HWMU-5 calculated background values
Results in brackets [##] represent duplicate sample concentrations.
NA - parameter not analyzed
J - concentration is estimated
filtered samples field filtered through 0.45 micron filter

Region Screening Level Key
ca - RSL based on cancer endpoint
nc - RSL basedon non-cancer endpoint
max - RSL based on ceiling limit
ca* - where nc screening level < 100X ca screening level
ca** - where nc screening level < 10X ca screening level

Table 5-1. Selection of Constituents of Potential Concern for Soil Gas
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Constituent	CASN	Maximum Concentrations			Residential Air Screening Level Calculated Using 0.1 Attenuation [a]			Is Constituent a Soil Gas COPC? [b]		
		Building 1034	Building 1041	Building 1549				Building 1034	Building 1041	Building 1549
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)		surrogate	(YES, no)	(YES, no)	(YES, no)
1,1,1-Trichloroethane	71-55-6	4	480	3.1	5200	n		no	no	no
1,1-Dichloroethane	75-34-3	–	–	2	15	c		no	no	no
1,1-Dichloroethene	75-35-4	–	52	–	210	n		no	no	no
1,2,4-Trimethylbenzene	95-63-6	17	–	110	7.3	n		**YES**	no	**YES**
1,2-Dichlorobenzene	95-50-1	–	–	7.9	210	n		no	no	no
1,3,5-Trimethylbenzene	108-67-8	14	–	94	6.3	n		**YES**	no	**YES**
1,3-Butadiene	106-99-0	31	37	43	0.81	c		**YES**	**YES**	**YES**
1,3-Dichlorobenzene	541-73-1	–	–	0.87	210	n	1,2-Dichlorobenzene	no	no	no
1,4-Dichlorobenzene	106-46-7	–	–	3.2	2.2	c		no	no	**YES**
1,4-Dioxane	123-91-1	–	–	5.5	3800	n		no	no	no
2,2,4-Trimethylpentane	540-84-1	–	–	180	NA			no	no	**YES**
2-Butanone	78-93-3	92	21	100	5200	n		no	no	no
2-Hexanone	591-78-6	15	2.1	15	NA			**YES**	**YES**	**YES**
Isopropanol	67-63-0	5.9	0.99	17	NA			**YES**	**YES**	**YES**
4-Ethyltoluene	622-96-8	11	1.6	54	NA			**YES**	**YES**	**YES**
4-Methyl-2-pentanone	108-10-1	7.5	1.3	10	3100	n		no	no	no
Acetone	67-64-1	620	190	720	32000	n		no	no	no
Benzene	71-43-2	18	21	34	3.1	c		**YES**	**YES**	**YES**
Bromodichloromethane	75-27-4	58	–	–	NA			**YES**	no	no
Bromomethane	74-83-9	5.7	3.9	–	5.2	n		**YES**	no	no
Carbon Disulfide	75-15-0	30	25	16	730	n		no	no	no
Carbon Tetrachloride	56-23-5	9.4	–	–	1.6	c		**YES**	no	no
Chloroform	67-66-3	8800	370	–	1.1	c		**YES**	**YES**	no
Chloromethane	74-87-3	6.3	2.2	4.2	14	c		no	no	no
cis-1,2-Dichloroethene	156-59-2	–	–	29	63	n	trans-1,2-Dichloroethene	no	no	no
Cyclohexane	110-82-7	8.9	3	56	6300	n		no	no	no
Dibromochloromethane	124-48-1	2.5	–	–	NA			**YES**	no	no
Dichlorodifluoromethane	75-71-8	7.8	3.5	3	210	n		no	no	no
Ethanol	64-17-5	36	23	120	NA			**YES**	**YES**	**YES**
Ethylbenzene	100-41-4	2.9	3.7	9.8	9.7	c		no	no	**YES**
Heptane	142-82-5	26	48	64	NA			**YES**	**YES**	**YES**
n-Hexane	110-54-3	34	57	61	730	n		no	no	no
Isopropylbenzene	98-82-8	0.78	–	10	420	n		no	no	no
m,p-Xylene	136777612	9.1	4.6	28	100	n	Xylenes (total)	no	no	no
Methyl tert-butyl ether	1634-04-4	–	–	42	94	c		no	no	no
Methylene Chloride	75-09-2	21	4.2	2	52	c		no	no	no
n-Propylbenzene	103-65-1	1.7	–	16	140	n	(USEPA 2002)	no	no	no
o-Xylene	95-47-6	4.6	3.4	29	730	n		no	no	no
Styrene	100-42-5	3.7	2.4	1.9	1000	n		no	no	no
Tetrachloroethene	127-18-4	4.8	540	4.1	4.1	c		**YES**	**YES**	no
Tetrahydrofuran	109-99-9	12	7.1	15	NA			**YES**	**YES**	**YES**
Toluene	108-88-3	16	19	37	5200	n		no	no	no
Trichloroethene	79-01-6	22	3300	3.7	12	c		**YES**	**YES**	no
Trichlorofluoromethane	75-69-4	3.4	3.4	7.1	730	n		no	no	no
Xylenes (total)	1330-20-7	14	7	57	100	n		no	no	no

Notes:
CASN = Chemical Abstracts Service Number.
COPC = Constituent of Potential Concern
µg/m^3 = Micrograms per cubic meter.
– = Not detected/ not analyzed/ not applicable.

[a] The screening levels used were residential air Regional Screening Levels (USEPA, 2008a) assuming an attenuation factor of 10 or soil gas screening levels (USEPA, 2002a) where indicated. Screening levels based on non-cancer effects were reduced by a factor of 10. n = noncancer, c = cancer.
[b] Constituents detected with maximum concentrations greater than screening levels or those without identified screening levels were considered COPCs.

Table 5-2. Selection of Constituents of Potential Concern for Soil
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	CASN	Maximum Concentrations			Adjusted Residential Soil Regional Screening Level [a]			Background Level [b]	Is Constituent a Soil COPC? [c]		
		Building 1034 (mg/kg)	Building 1041 (mg/kg)	Building 1549 (mg/kg)	(mg/kg)		Surrogate	(mg/kg)	Building 1034 (YES, no)	Building 1041 (YES, no)	Building 1549 (YES, no)
Explosives											
Nitroglycerine	55-63-0	–	–	2.5	0.61	n		–	no	no	**YES**
Polychlorinated Biphenyls											
Aroclor 1254	11097-69-1	0.048	0.21	0.095	0.11	c**		–	no	**YES**	no
Aroclor 1260	11096-82-5	0.064	0.092	0.16	0.22	c		–	no	no	no
Volatile Organic Compounds											
2-Butanone	78-93-3	–	–	0.036	2,800	ns		–	no	no	no
Acetone	67-64-1	0.065	0.01	0.14	6,100	n		–	no	no	no
Carbon Disulfide	75-15-0	0.00032	–	0.00048	67	ns		–	no	no	no
Chloroform	67-66-3	0.0058	0.0063	–	0.3	c		–	no	no	no
Chloromethane	74-87-3	0.00071	–	–	1.7	c*		–	no	no	no
Dichlorodifluoromethane	75-71-8	0.017	0.0083	0.012	19	n		–	no	no	no
Methyl cyclohexane	108-87-2	0.0009	–	0.00034	720	ns	Cyclohexane	–	no	no	no
Methylene Chloride	75-09-2	–	0.015	–	11	c		–	no	no	no
Toluene	108-88-3	–	0.0007	0.00044	500	ns		–	no	no	no
Trichloroethene	79-01-6	–	0.0015	–	3	c		–	no	no	no
Xylenes (total)	1330-20-7	0.0012	–	–	60	ns		–	no	no	no
Semi-Volatile Organic Compounds											
Acenaphthene	83-32-9	0.049	–	–	340	n		–	no	no	no
Acenaphthylene	208-96-8	0.64	–	–	340	n	Acenaphthene	–	no	no	no
Anthracene	120-12-7	0.3	–	–	1,700	n		–	no	no	no
Benzo(a)anthracene	56-55-3	2.6	–	–	0.2	c		–	**YES**	no	no
Benzo(a)pyrene	50-32-8	4.0	–	–	0.02	c		–	**YES**	no	no
Benzo(b)fluoranthene	205-99-2	4.0	–	–	0.2	c		–	**YES**	no	no
Benzo(g,h,i)perylene	191-24-2	3.1	–	–	170	n	Pyrene	–	no	no	no
Benzo(k)fluoranthene	207-08-9	2.6	–	–	2	c		–	**YES**	no	no
bis(2-Ethylhexyl)phthalate	117-81-7	–	0.051	–	35	c*		–	no	no	no
Caprolactam	105-60-2	0.20	0.16	0.14	3,100	n		–	no	no	no
Chrysene	218-01-9	3.0	–	–	15	c		–	no	no	no
Dibenzo(a,h)anthracene	53-70-3	2.2	–	–	0.02	c		–	**YES**	no	no
Dibenzofuran	132-64-9	0.033	–	–	8	n	Furan	–	no	no	no
Diethylphthalate	84-66-2	0.094	0.12	–	4,900	n		–	no	no	no
Di-n-Butylphthalate	84-74-2	0.056	0.077	0.043	610	n		–	no	no	no
Fluoranthene	206-44-0	4.7	–	–	230	n		–	no	no	no
Fluorene	86-73-7	0.14	–	–	230	n		–	no	no	no
Indeno(1,2,3-cd)pyrene	193-39-5	2.8	–	0.18	0.2	c		–	**YES**	no	**YES**
Naphthalene	91-20-3	0.046	–	–	4	c*		–	no	no	no
Pyrene	129-00-0	5.3	–	–	170	n		–	no	no	no
Inorganics											
Aluminum	7429-90-5	61,700	31,800	40,700	7,700	n		40,041	**YES**	**Yes_BKG**	**YES**
Arsenic	7440-38-2	11.7	4.2	6.7	0.4	c*		15.8	**Yes_BKG**	**Yes_BKG**	**Yes_BKG**
Barium	7440-39-3	174	146	82.9	1,500	n		209	no	no	no
Beryllium	7440-41-7	2.3	2.5	1.7	16	n		1.02	no	no	no
Cadmium	7440-43-9	0.69	0.54	0.64	7	n		0.69	no	no	no
Calcium	7440-70-2	6,100	16,600	16,000	NA			–	no	no	no
Chromium [d]	7440-47-3	59.1	38.3	40	280	c		65	no	no	no
Cobalt	7440-48-4	34.5	37.3	11.8	2	n		72	**Yes_BKG**	**Yes_BKG**	**Yes_BKG**
Copper	7440-50-8	79	20.4	29.5	310	n		54	no	no	no
Iron	7439-89-6	90,500	60,900	53,100	5,500	n		50,962	**YES**	**YES**	**YES**
Lead	7439-92-1	102	34.9	62.2	400			27	no	no	no
Magnesium	7439-95-4	9,880	9,670	10,600	NA			–	no	no	no
Manganese	7439-96-5	1130	3300	457	180	n		2,543	**Yes_BKG**	**YES**	**Yes_BKG**
Mercury	7439-97-6	0.49	0.27	0.13	0.7	ns		0.13	no	no	no

Table 5-2. Selection of Constituents of Potential Concern for Soil
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	CASN	Maximum Concentrations			Adjusted Residential Soil Regional Screening Level [a]			Background Level [b]	Is Constituent a Soil COPC? [c]		
		Building 1034 (mg/kg)	Building 1041 (mg/kg)	Building 1549 (mg/kg)	(mg/kg)		Surrogate	(mg/kg)	Building 1034 (YES, no)	Building 1041 (YES, no)	Building 1549 (YES, no)
Nickel	7440-02-0	30.3	30.7	23.2	160	n		63	no	no	no
Potassium	7440-09-7	6,270	5,150	2,640	NA			–	no	no	no
Selenium	7782-49-2	–	–	0.88	39	n		–	no	no	no
Sodium	7440-23-5	–	–	312	NA			–	no	no	no
Vanadium	7440-62-2	133	67.4	99.5	55	n		108	**YES**	**Yes_BKG**	**Yes_BKG**
Zinc	7440-66-6	182	78.6	44.1	2,300	n		202	no	no	no

Notes:
CASN = Chemical Abstracts Service Number.
COPC = Constituent of Potential Concern.
mg/kg = Milligrams per kilogram.
– = Not detected/ not analyzed/ not applicable.

[a] The screening levels used were Regional Screening Levels for the residential scenario from USEPA (2008a). Screening levels based on non-cancer effects were adjusted by a factor of 10. For chemicals whose screening levels were based on cancer effects but the noncancer screening level was less than 10x the cancer level (tagged with c**), the non-cancer level was used after adjustment. c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer; m = Concentration may exceed ceiling limit; s = Concentration may exceed saturation concentration (C_{sat}).

[b] Background levels for metals are facility-wide soil background point estimates taken from Facility-Wide Background Study Report (IT Corporation, 2001).

[c] Constituents detected with maximum concentrations greater than screening levels were considered COPCs for human receptors unless they were known laboratory contaminants or essential nutrients. They are tagged "Yes" in COPC column. Metals detected at maximum concentrations greater than screening levels but lower than background were considered COPC and are tagged Yes_BKG in COPC column.

[d] Total chromium (1:6 ratio Cr VI : Cr III) used for soil RSL values and chromium (III) (Insoluble Salts) was used for the tap-water and protection of groundwater RSL values.

Table 5-3. Selection of Constituents of Potential Concern for Groundwater
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	CASN	Maximum Concentrations	Adjusted tap-water Risk Screening Level [a]		Is Constituent a Groundwater COPC? [b]
		µg/l	µg/l		(YES, no)
Volatile Organic Compounds					
2-Butanone	78-93-3	8.7	7.10E+02	n	no
Acetone	67-64-1	45	2.20E+03	n	no
Chloroform	67-66-3	52	1.90E-01	c	**YES [c]**
Trichloroethene	79-01-6	0.32	1.70E+00	c	no
Polychlorinated Biphenyls					
Aroclor 1260	11096-82-5	1.8	3.40E-02	c	**YES [d]**
Inorganics (Filtered Samples)					
Aluminum	7429-90-5	13,100	3.70E+03	n	**YES**
Antimony	7440-36-0	<5	1.50E+01	n	no
Arsenic	7440-38-2	12.9	4.50E-02	c	**YES**
Barium	7440-39-3	184	7.30E+02	n	no
Beryllium	7440-41-7	1.4	7.30E+00	n	no
Calcium	7440-70-2	71,100	–		no
Chromium	7440-47-3	24	5.50E+03	n	no
Cobalt	7440-48-4	33	1.10E+00	n	**YES**
Copper	7440-50-8	37	1.50E+02	n	no
Iron	7439-89-6	82,600	2.60E+03	n	**YES**
Lead	7439-92-1	7.5	1.50E+01	L	no
Magnesium	7439-95-4	29,900	–		no
Manganese	7439-96-5	2,180	8.80E+01	n	**YES**
Nickel	7440-02-0	83.5	7.30E+01	n	**YES**
Potassium	7440-09-7	8,210	–		no
Sodium	7440-23-5	21,600	–		no
Vanadium	7440-62-2	53	2.60E+01	n	**YES**
Zinc	7440-66-6	61.3	1.10E+03	n	no

Notes:
CASN = Chemical Abstracts Service Number.
µg/l = Micrograms per liter.
– = Not detected/ not analyzed/ not applicable.

[a] The screening levels used were tapwater Regional Screening Levels from USEPA (2008a). Screening levels based on non-cancer effects were adjusted by a factor of 10. c = cancer; n = noncancer, L = lead MCL (calculated using different methodology, and therefore, not adjusted).

[b] Constituents detected with maximum concentrations greater than screening levels were considered COPCs unless they were essential nutrients.

[c] Although chloroform was detected at concentrations greater than the tapwater RSL, chloroform present in groundwater samples is associated with leaking potable water supply lines traversing the site and not site-related. Therefore, it was not selected as a COPC.

[d] Although Aroclor 1260 was detected at a concentration greater than the tapwater RSL in one sample, a confirmation sample was collected later using low-stress purging. Aroclor-1260 was not detected in the confirmation sample, indicating Aroclor-1260 is not present in the dissolved phase in the groundwater, and its low level detection in the initial sample was a result of the particulate matter present in the sample. Therefore, it was not selected as a COPC.

Table 5-4. Physical and Chemical Properties
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	Molecular Weight (g/mol)	[ref]	Water Solubility (mg/L 25 °C)	[ref]	Vapor Pressure (mm Hg 25 °C)	[ref]	Henry's Law Constant (atm-m³/mol) (25 °C)	[ref]	Diffusivity in Air (cm²/sec)	[ref]	Diffusivity in Water (cm²/sec)	[ref]	Koc or Kd (mL/g)	[ref]	Log Kow	[ref]
Volatile Organic Compounds													**Koc**			
Acetone	5.81E+01	*SCDM*	1.00E+06	*SCDM*	2.30E+02	*SCDM*	3.88E-05	*SCDM*	1.24E-01	*J&E*	1.14E-05	*J&E*	5.81E-01	*SCDM*	-2.40E-01	*CFATE*
Benzene	7.81E+01	*SCDM*	1.75E+03	*SCDM*	9.50E+01	*SCDM*	5.55E-03	*SCDM*	8.80E-02	*J&E*	9.80E-06	*J&E*	5.90E+01	*SCDM*	2.13E+00	*SCDM*
Bromodichloromethane	1.64E+02	*SCDM*	6.74E+03	*SCDM*	5.00E+01	*SCDM*	1.60E-03	*SCDM*	2.98E-02	*J&E*	1.06E-05	*J&E*	5.50E+01	*SCDM*	2.10E+00	*SCDM*
Bromomethane	9.49E+01	*SCDM*	1.52E+04	*SCDM*	1.62E+03	*SCDM*	6.24E-03	*SCDM*	7.28E-02	*J&E*	1.21E-05	*J&E*	1.05E+01	*SCDM*	1.19E+00	*SCDM*
1,3-Butadiene	5.41E+01	*SCDM*	7.35E+02	*SCDM*	2.11E+03	*SCDM*	7.36E-02	*SCDM*	2.49E-01	*RAIS*	1.08E-05	*RAIS*	4.47E+01	*SCDM*	1.99E+00	*SCDM*
Carbon tetrachloride	1.54E+02	*SCDM*	7.93E+02	*SCDM*	1.15E+02	*SCDM*	3.04E-02	*SCDM*	7.80E-02	*J&E*	8.80E-06	*J&E*	1.74E+02	*SCDM*	2.83E+00	*CFATE*
Chloroform	1.19E+02	*SCDM*	7.92E+03	*SCDM*	1.97E+02	*SCDM*	3.67E-03	*SCDM*	1.04E-01	*J&E*	1.00E-05	*J&E*	3.98E+01	*SCDM*	1.97E+00	*CFATE*
Dibromochloromethane	2.08E+02	*SCDM*	2.60E+03	*SCDM*	4.90E+00	*SCDM*	7.83E-04	*SCDM*	1.96E-02	*J&E*	1.05E-05	*J&E*	6.30E+01	*SCDM*	2.23E+00	*CFATE*
Ethanol	4.61E+01	*EPI*	7.92E+05	*EPI*	6.09E+01	*EPI*	4.66E-06	*EPI*	1.35E-01	*L90-calc'd*	1.20E-05	*L90-calc*	1.00E+00	*EPI*	-3.10E-01	*EPI*
4-Ethyltoluene	1.20E+02	*EPI*	7.96E+01	*EPI*	3.00E+00	*CFATE*	4.55E-03	*EPI*	7.28E-02	*L90-calc*	6.59E-06	*L90-calc*	8.39E+02	*EPI*	3.63E+00	*EPI*
Heptane	1.00E+02	*RAIS*	3.40E+00	*RAIS*	4.60E+01	*RAIS*	1.70E+00	*EPI*	6.49E-02	*RAIS*	7.59E-06	*RAIS*	2.75E+02	*RAIS*	4.66E+00	*RAIS*
2-Hexanone	1.00E+02	*SCDM*	1.75E+04	*SCDM*	1.16E+01	*SCDM*	9.30E-05	*HSDB*	7.82E-02	*L90-calc'd*	7.18E-06	*L90-calc*	2.33E+01	*SCDM*	1.38E+00	*CFATE*
Isopropanol	6.01E+01	*PhysPro*	1.00E+00	*PhysProp*	4.54E+01	*CFATE*	7.89E-06	*CFATE*	1.08E-01	*L90-calc*	9.91E-06	*L90-calc*	1.06E+00	*EPI*	5.00E-02	*PhysProp*
Tetrachloroethene	1.66E+02	*SCDM*	2.00E+02	*SCDM*	1.86E+01	*SCDM*	1.84E-02	*SCDM*	7.20E-02	*J&E*	8.20E-06	*J&E*	1.55E+02	*SCDM*	3.40E+00	*CFATE*
Tetrahydrofuran	7.21E+01	*SCDM*	1.00E+06	*SCDM*	1.62E+02	*SCDM*	2.42E-04	*SCDM*	8.94E-02	*L90-calc'd*	1.00E-05	*est'd*	2.83E+00	*SCDM*	4.60E-01	*SCDM*
Trichloroethene	1.31E+02	*SCDM*	1.10E+03	*SCDM*	7.35E+01	*SCDM*	1.03E-02	*SCDM*	7.90E-02	*J&E*	9.10E-06	*J&E*	1.66E+02	*SCDM*	2.42E+00	*CFATE*
1,2,4-Trimethylbenzene	1.20E+02	*RAIS*	5.70E+01	*RAIS*	2.10E+00	*CFATE*	6.16E-03	*CFATE*	6.44E-02	*RAIS*	7.92E-06	*RAIS*	3.72E+03	*RAIS*	3.78E+00	*RAIS*
1,3,5-Trimethylbenzene	1.20E+02	*RAIS*	4.82E+01	*RAIS*	2.10E+00	*RAIS*	8.78E-03	*RAIS*	6.02E-02	*RAIS*	8.67E-06	*RAIS*	1.62E+03	*RAIS*	3.42E+00	*RAIS*
2,2,4-Trimethylpentane	1.14E+02	*RAIS*	2.44E+00	*RAIS*	4.93E+01	*RAIS*	6.76E-01	*EPI*	5.74E-02	*RAIS*	7.06E-06	*RAIS*	2.76E+02	*RAIS*	4.09E+00	*RAIS*
Semi-Volatile Organic Compounds													**Koc**			
Benzo(a)anthracene	2.28E+02	*CFATE*	9.40E-03	*CFATE*	1.05E-07	*CFATE*	3.35E-06	*CFATE*	5.10E-02	*SSG2*	9.00E-06	*SSG2*	3.98E+05	*SSG2*	5.66E+00	*CFATE*
Benzo(a)pyrene	2.52E+02	*CFATE*	1.62E-03	*CFATE*	5.49E-09	*CFATE*	1.13E-06	*CFATE*	4.30E-02	*SSG2*	9.00E-06	*SSG2*	1.02E+06	*SSG2*	5.97E+00	*CFATE*
Benzo(b)fluoranthene	2.52E+02	*CFATE*	1.50E-03	*CFATE*	5.00E-07	*CFATE*	1.11E-04	*CFATE*	2.26E-02	*SSG2*	5.56E-06	*SSG2*	1.23E+06	*SSG2*	6.12E+00	*CFATE*
Dibenzo(a,h)anthracene	2.78E+02	*CFATE*	2.49E-03	*CFATE*	1.00E-10	*CFATE*	1.47E-08	*CFATE*	2.02E-02	*J&E*	5.18E-06	*J&E*	3.80E+06	*SSG2*	6.50E+00	*CFATE*
Indeno(1,2,3-cd)pyrene	2.76E+02	*CFATE*	2.20E-05	*CFATE*	1.00E-10	*CFATE*	1.60E-06	*CFATE*	1.90E-02	*SSG2*	5.66E-06	*SSG2*	3.47E+06	*SSG2*	6.58E+00	*CFATE*
Polychlorinated Biphenyls													**Koc**			
Aroclor 1254	3.27E+02	*HSDB*	6.00E-02	*RAIS*	6.53E-06	*EPI*	1.45E-04	*EPI*	1.56E-02	*J&E*	5.00E-06	*J&E*	2.00E+05	*RAIS*	6.79E+00	*EPI*
Explosives													**Koc**			
Nitroglycerine	2.27E+02	*EPI*	1.31E+03	*EPI*	2.72E-02	*EPI*	6.23E-06	*EPI*	6.40E-02	*L90-calc'd*	6.29E-06	*L90-calc*	1.31E+02	*EPI*	1.62E+00	*EPI*
Inorganics													**Kd**			
Aluminum	2.70E+01	*SCDM*	insoluble	*SCDM*	—		—		—		—		1.50E+03	*Kd-SCDM*	3.30E-01	*EPI*
Arsenic	7.49E+01	*HSDB*	insoluble	*HSDB*	—		—		—		—		2.90E+01	*Kd-SCDM*	6.80E-01	*SCDM*
Cobalt	5.89E+01	*SCDM*	insoluble	*SCDM*	—		—		—		—		4.50E+01	*Kd-SCDM*	2.30E-01	*EPI*
Copper	6.35E+01	*SCDM*	insoluble	*SCDM*	—		—		—		—		4.28E+02	*Kd-SCDM*	-5.70E-01	*EPI*
Iron	5.58E+01	*SCDM*	insoluble	*SCDM*	—		—		—		—		2.50E+01	*Kd-SCDM*	-7.70E-01	*EPI*
Lead	2.07E+02	*HSDB*	insoluble	*SCDM*	—		—		—		—		9.00E+02	*Kd-SCDM*	7.30E-01	*SCDM*
Manganese	5.49E+01	*SCDM*	insoluble	*SCDM*	—		—		—		—		6.50E+01	*Kd-SCDM*	2.30E-01	*EPI*
Mercury	2.01E+02	*RAIS*	5.60E-02	*HSDB*	1.96E-03	*RAIS*	1.89E-09	*EPI*	3.07E-02	*RAIS*	6.30E-06	*RAIS*	5.20E+01	*Kd-SSG2*	6.20E-01	*RAIS*
Nickel	5.87E+01	*SCDM*	insoluble	*SCDM*	—		—		—		—		6.50E+01	*Kd-SCDM*	-5.70E-01	*EPI*
Vanadium	5.09E+01	*SCDM*	insoluble	*SCDM*	—		—		—		—		1.00E+03	*Kd-SCDM*	2.30E-01	*EPI*

Notes:

References: CFATE (SRC 2008); HSDB (NLM 2008); EPISuite (USEPA 2004); J&E (USEPA 2003); Lyman, et al. (1990); RAIS (USDOE 2008); SCDM (USEPA 2004); SSG2 (USEPA 2002).

–	Not applicable.
atm-m³/mol	Atmospheres × cubic meters per mole.
°C	Degrees Celsius.
cm²/sec	Square centimeters per second.
g/mol	Grams per mole.
Kd	Soil-water distribution coefficient (inorganics).
Koc	Organic carbon partition coefficient (organics).
Kow	Octanol-water partition coefficient.
mg/L	Milligrams per liter.
mL/g	Milliliters per gram.
mm Hg	Millimeters of mercury.
NA	Not available.

Table 5-5. Soil Gas Exposure Point Concentrations
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent of Potential Concern (COPC)		Building 1034		Building 1041		Building 1549	
		COPC?	EPC [a] ($\mu g/m^3$)	COPC?	EPC [a] ($\mu g/m^3$)	COPC?	EPC [a] ($\mu g/m^3$)
1,2,4-Trimethylbenzene	95-63-6	YES	1.70E+01 m	no	–	YES	1.10E+02 m
1,3,5-Trimethylbenzene	108-67-8	YES	1.40E+01 m	no	–	YES	9.40E+01 m
1,3-Butadiene	106-99-0	YES	1.80E+01	YES	3.70E+01 m	YES	3.60E+01
1,4-Dichlorobenzene	106-46-7	no	–	no	–	YES	3.20E+00 m
2,2,4-Trimethylpentane	540-84-1	no	–	no	–	YES	1.80E+02 m
2-Hexanone	591-78-6	YES	1.37E+01	YES	2.10E+00 m	YES	1.50E+01 m
Isopropanol	67-63-0	YES	5.90E+00 m	YES	9.90E-01 m	YES	9.85E+00
4-Ethyltoluene	622-96-8	YES	1.10E+01 m	YES	1.60E+00 m	YES	4.26E+01
Benzene	71-43-2	YES	1.12E+01	YES	2.10E+01 m	YES	2.30E+01
Bromodichloromethane	75-27-4	YES	5.80E+01 m	no	–	no	–
Bromomethane	74-83-9	YES	5.70E+00 m	no	–	no	–
Carbon Tetrachloride	56-23-5	YES	9.40E+00 m	no	–	no	–
Chloroform	67-66-3	YES	6.08E+03	YES	3.70E+02 m	no	–
Dibromochloromethane	124-48-1	YES	2.50E+00 m	no	–	no	–
Ethanol	64-17-5	YES	2.02E+01	YES	2.30E+01 m	YES	7.70E+01
Ethylbenzene	100-41-4	no	–	no	–	YES	5.94E+00
Heptane	142-82-5	YES	1.43E+01	YES	4.09E+01	YES	4.09E+01
Tetrachloroethene	127-18-4	YES	4.80E+00 m	YES	5.40E+02 m	no	–
Tetrahydrofuran	109-99-9	YES	1.20E+01 m	YES	7.10E+00 m	YES	1.50E+01 m
Trichloroethene	79-01-6	YES	1.61E+01	YES	3.30E+03 m	no	–

Notes:
CASN = Chemical Abstracts Service Number.
COPC = Constituent of Potential Concern
$\mu g/m^3$ = Micrograms per cubic meter.

[a] The exposure point concentration (EPC) was the upper confidence level on the mean (UCL) or the maximum concentration where the UCL was incalculable.
EPCs marked with "m" are based on the maximum detected concentration.
The UCLs were calculated using ProUCL 4.2. The UCL used is the one recommended by ProUCL 4.2.
The UCLs were calculated only for datasets with a sample number greater than or equal to 7 with at least 5 detects.

Table 5-6. Soil Exposure Point Concentrations
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent of Potential Concern (COPC)	CASN	Building 1034		Building 1041		Building 1549	
		COPC?	EPC [a] (mg/kg)	COPC?	EPC [a] (mg/kg)	COPC?	EPC [a] (mg/kg)
Explosives							
Nitroglycerine	55-63-0	no	–	no	–	YES	2.50E+00 m
Polychlorinated Biphenyls							
Aroclor 1254	11097-69-1	no	–	YES	2.10E-01 m	no	–
Semi-Volatile Organic Compounds							
Benzo(a)anthracene	56-55-3	YES	2.60E+00 m	no	–	no	–
Benzo(a)pyrene	50-32-8	YES	4.00E+00 m	no	–	no	–
Benzo(b)fluoranthene	205-99-2	YES	1.28E+00	no	–	no	–
Dibenzo(a,h)anthracene	53-70-3	YES	2.20E+00 m	no	–	no	–
Indeno(1,2,3-cd)pyrene	193-39-5	YES	2.80E+00 m	no	–	YES	1.80E-01 m
Inorganics							
Aluminum	7429-90-5	YES	4.03E+04	Yes_BKG	2.88E+04	YES	3.22E+04
Arsenic	7440-38-2	Yes_BKG	7.42E+00	Yes_BKG	3.59E+00	Yes_BKG	5.45E+00
Cobalt	7440-48-4	Yes_BKG	1.68E+01	Yes_BKG	2.44E+01	Yes_BKG	9.84E+00
Iron	7439-89-6	YES	6.25E+04	YES	5.13E+04	YES	3.96E+04
Manganese	7439-96-5	Yes_BKG	8.44E+02	YES	1.92E+03	Yes_BKG	3.33E+02
Vanadium	7440-62-2	YES	9.21E+01	Yes_BKG	5.87E+01	Yes_BKG	7.18E+01

Notes:
– = Not applicable.
CASN = Chemical Abstracts Service Number.
COPC = Constituent of Potential Concern
EPC = Exposure Point Concentration.
mg/kg = Milligrams per kilogram.

[a] The exposure point concentration (EPC) was the upper confidence level on the mean (UCL) or the maximum concentration where the UCL was incalculable.
EPCs marked with "m" are based on the maximum detected concentration.
The UCLs were calculated using ProUCL 4.2. The UCL used is the one recommended by ProUCL 4.2.

Table 5-7. Groundwater Exposure Point Concentrations
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent of Potential Concern (COPC)	CASN	RAAP-047	
		COPC?	EPC [a] µg/l
Inorganics			
Aluminum	7429-90-5	YES	13,100 m
Arsenic	7440-38-2	YES	12.9 m
Cobalt	7440-48-4	YES	33 m
Iron	7439-89-6	YES	82,600 m
Manganese	7439-96-5	YES	2,180 m
Nickel	7440-02-0	YES	83.5 m
Vanadium	7440-62-2	YES	53 m

Notes:
CASN = Chemical Abstract Service Registry Number.
COPC = Constituent of Potential Concern.
EPC = Exposure Point Concentration.
µg/l = Micrograms per liter.

[a] EPCs marked with "m" are based on the maximum detected concentration.

Table 5-8. Receptor-Specific Exposure Parameters
RAAP-047 RFI Report, Radford Army Amunition

Parameter	Symbol	units	Residents				Site Worker		Construction Worker	
			Child		Adult					
General Factors										
Averaging Time (cancer)	ATc	days	25,550	[a]	25,550	[a]	25,550	[a]	25,550	[a]
Averaging Time (noncancer)	ATnc	days	2,190	[a]	10,950	[a]	9,125	[a]	182	[a]
Body Weight	BW	kg	15	[c]	70	[b,c]	70	[b,c]	70	[b,c]
Exposure Frequency	EF	days/year	350	[b,c]	350	[b,c]	250	[b,c]	130	PJ
Exposure Duration	ED	years	6	[b,c]	30	[b,c]	25	[b,c]	1	PJ
Soil - Ingestion (Oral)										
Incidental Soil Ingestion Rate	IRs	mg/day	200	[c]	100	[c]	50	[c]	330	[f]
Fraction Ingested from Souce	FI	unitless	1		1		1		1	
Soil - Dermal Contact										
Exposed Skin Surface Area	SSAs	cm^2	2,800	[d]	5,700	[d]	3,300	[d]	3,300	[d]
Soil-to-Skin Adherence Rate	SAR	$mg/cm^2/day$	0.2	[d]	0.07	[d]	0.1	[d]	0.3	[f]
Soil - Inhalation of Dust										
Exposure Time	ET	hours/day	24	[a,h]	24	[a,h]	8	[c,h]	8	[c,h]
Indoor Air - Inhalation										
Exposure Time	ET	hours/day	24	[a,h]	24	[a,h]	8	[c,h]	8	[c,h]
Groundwater - Ingestion (Oral)										
Groundwater Ingestion Rate	IRgw	L/day	1.5	[b,g]	2	[b,c]	1	[c]	–	
Groundwater - Dermal Contact										
Exposed Skin Surface Area	SSAgw	cm^2	6,600	[d]	18,000	[d]	–		–	
Event Frequency	EV	events/day	1	[d]	1	[d]				
Event Duration	t_{event}	hours/day	1	[d]	0.58	[d]	–		–	

[a] The averaging time for cancer risk is the expected lifespan of 70 years expressed in days.
The averaging time for non-cancer hazard is the total exposure duration expressed in days.
[b] USEPA (1989).
[c] USEPA (1991).
[d] USEPA (2004).
[e] USEPA (1997).
[f] USEPA (2002).
[g] 90th percentile recommended value for ages <3 and 3 to 5 (Table 3-30).
[h] USEPA (2009).

cm Centimeter.
kg Kilogram.
L Liter.
m Meter.
mg Milligram.
PJ Professional judgment (see text).
yr Year.
– Not applicable.

Table 5-9. Risk and Hazard Equations for Exposure to Soil and Soil Gas
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

ROUTE-SPECIFIC RISK/HAZARD:

Oral: $ELCR_o$ *or* HQ_o = $\frac{EPCs \times FI \times IRs \times EF \times ED}{(10^6\ mg/kg) \times BW \times (AT_C\ or\ AT_{NC}) \times ([1/CSF_o]\ or\ RfD_o)}$

Dermal: $ELCR_d$ *or* HQ_d = $\frac{EPCs \times SSAs \times SAR \times ABSd \times EF \times ED}{(10^6\ mg/kg) \times BW \times (AT_C\ or\ AT_{NC}) \times ([1/CSF_a]\ or\ RfD_a)}$

Inhalation (Soil/Dust): $ELCR_i$ *or* HQ_i = $\frac{EPCs / PEF \times ET \times EF \times ED}{(AT_C\ or\ AT_{NC}) \times 24\ hours/day \times ([1/URF \times (10^{-3}\ mg/mg)]\ or\ RfC)}$

$PEF = \frac{Q/C_{wind} \times (3{,}600\ sec/hr)}{RPF \times (1\text{-}V) \times (Um/Ut)^3 \times Fx}$ used for non-VOCs

Inhalation (Soil Gas/Indoor Air): $ELCR_i$ *or* HQ_i = $\frac{EPCia \times (10^{-3}\ mg/\mu g) \times ET \times EF \times ED}{(AT_C\ or\ AT_{NC}) \times 24\ hours/day \times ([1/URF \times (10^{-3}\ mg/\mu g)]\ or\ RfC)}$

TOTAL CANCER RISK: $ELCR = ELCR_o + ELCR_d + ELCR_i$

TOTAL NON-CANCER HAZARD: $HI = HQ_o + HQ_d + HQ_i$

Variable Definitions:

ABSd	Dermal absorption efficiency (unitless) (Table 5-12).
AT_C	Averaging time for cancer effects (days) (Table 5-8).
AT_{NC}	Averaging time for noncancer effects (days) (Table 5-8).
BW	Body weight (kg) (Table 5-8).
CSF	Cancer slope factor for oral (CSF_o) or dermal (adjusted to an absorbed dose, CSF_a) exposure (per mg/kg/day) (Table 5-15).
ED	Exposure duration (years) (Table 5-8).
EF	Exposure frequency (days/year) (Table 5-8).
ELCR	Excess lifetime cancer risk (unitless).
EPCs	Exposure point concentration in soil (mg/kg).
EPCia	Exposure point concentration in indoor air ($\mu g/m^3$), modeled from soil gas exposure point concentration using the Johnson & Ettinger model (Appendix E).
ET	Exposure time for inhalation exposure (hours/day) (Table 5-8).
FI	Fraction ingested from area of concern (unitless) (Table 5-8).
Fx	Function of Ut/Um (unitless); $Fx = 0.18 \times (8x^3 + 12x) \times \exp[-(x^2)]$, where $x = 0.886 \times (Ut/Um)$.
HI	Hazard index for non-cancer effects (unitless); sum of the HQs.
HQ	Hazard quotient for non-cancer effects (unitless).
IRs	Ingestion rate of soil (mg/day) (Table 5-8).
PEF	Particulate emission factor (m^3/kg).
Q/C_{wind}	Particulate emission flux per unit concentration [$(g/m^2/sec)/(kg/m^3)$].
RfC	Reference concentration for inhalation exposure (mg/m^3) (Table 5-14).
RfD	Reference dose for oral (RfD_o) or dermal (adjusted to an absorbed dose, RfD_a) exposure (mg/kg/day) (Table 5-13).
RPF	Respirable particle fraction (0.036 $g/m^2/hr$).
SAR	Soil-to-skin adherence rate ($mg/cm^2/day$) (Table 5-8).
SSAs	Exposed skin surface area for soil contact (cm^2) (Table 5-8).

Table 5-9. Risk and Hazard Equations for Exposure to Soil and Soil Gas
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Um	Mean annual wind speed (m/sec).
URF	Unit risk factor for inhalation exposure (per $\mu g/m^3$) (Table 5-16).
Ut	Equivalent threshold value of windspeed at 7 meters (11.32 m/sec).
V	Fraction of vegetative cover (unitless).
VOCs	Volatile organic compounds.

Table 5-10. Risk and Hazard Equations for Exposure to Groundwater
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

ROUTE-SPECIFIC RISK/HAZARD:

Oral: $ELCR_o$ *or* HQ_o $= \dfrac{EPC_{gw} \times IR_{gw} \times EF \times ED}{BW \times (AT_C \text{ or } AT_{NC}) \times ([1/CSF_o] \text{ or } RfD_o)}$

Dermal: $ELCRd$ *or* HQd $= \dfrac{DA \times SSAgw \times EV \times EF \times ED}{BW \times (ATC \text{ or } ATNC) \times ([1/CSFa] \text{ or } RfDa)}$

Inorganics: $DA = \dfrac{EPC_{gw} \times K_p \times t_{event}}{1000\ cm^3/L}$

TOTAL CANCER RISK: $ELCR = ELCR_o + ELCR_d + ELCR_i$

TOTAL NON-CANCER HAZARD: $HI = HQ_o + HQ_d + HQ_i$

Variable Definitions:	
AT_C	Averaging time for cancer effects (days) (Table 5-8).
AT_{NC}	Averaging time for non-cancer effects (days) (Table 5-8).
BW	Body weight (kg) (Table 5-8).
CSF	Cancer slope factor for oral (CSFo) or dermal (adjusted to an absorbed dose, CSFa) exposure (per mg/kg/day) (Table 5-15).
DA	Absorbed dose per event (mg/cm²/event).
ED	Exposure duration (years) (Table 5-8).
EF	Exposure frequency (days/year) (Table 5-8).
ELCR	Excess lifetime cancer risk (unitless).
EPC_{gw}	Exposure point concentration in groundwater (mg/L) (Table 5-7).
EV	Event frequency (events/day) (Table 5-8).
HI	Hazard index for non-cancer effects (unitless); sum of the HQs.
HQ	Hazard quotient for non-cancer effects (unitless).
IR_{gw}	Ingestion rate of groundwater (L/day) (Table 5-8).
K_p	Permeability coefficient (cm/hour) (Table 5-12).
MW	Molecular weight (g/mol) (Table 5-4).
RfD	Reference dose for oral (RfD_o) or dermal (adjusted to an absorbed dose, RfDa) exposure (mg/kg/day) (Table 5-13).
SSAgw	Exposed skin surface area for groundwater contact (cm²) (Table 5-8).
t_{event}	Event duration (hours/event) (Table 5-8).

Table 5-11. Calculation of the Particulate Emission Factor for Soil Exposure
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Particulate Emission Factor:			
x =	2.138	unitless	Function of Ut/Um; x = 0.886 × (Ut/Um)
Fx =	0.1934	unitless	Function of x; Fx = 0.18 × ($8x^3 + 12x$) × $\exp(-x^2)$
PEF =	1.36E+09	m^3/kg	Particulate emission factor (m^3/kg)
Model Input Parameters:			
Foc =	0.006	unitless	Fraction organic carbon (USEPA 2002c, default)
ρ_b =	1.5	g/cm^3	Soil dry bulk density (USEPA 2002c, default)
θ_T =	0.434	unitless	Total soil porosity (USEPA 2002c, default)
θ_{as} =	0.284	unitless	Air-filled soil porosity [= θ_T - θ_{ws}]
θ_{ws} =	0.15	unitless	Water-filled soil porosity (USEPA 2002c, default)
Q/C_{vol} =	68.18	$(g/m^2/sec)/(kg/m^3)$	Volatilization flux per unit concentration (USEPA 2002c, default)
Q/C_{wind} =	93.77	$(g/m^2/sec)/(kg/m^3)$	Wind-related particulate emission flux per unit concentration (USEPA 2002c, default)
RPF =	0.036	$g/m^2/hour$	Respirable particle fraction (USEPA 2002c).
T =	9.5E+08	sec	Exposure interval (USEPA 2002c)
Um =	4.69	m/sec	Mean annual wind speed for Roanoke, Virginia (USDOE 1986)
Ut =	11.32	m/sec	Equivalent threshold value of windspeed at 7 meters (USEPA 2002c)
V =	0.5	unitless	Fraction vegetative cover (USEPA 2002c, default)

atm	Atmosphere.	kg	Kilogram.	mol	Mole.
cm	Centimeter.	L	Liter.	NA	Not available.
g	Gram.	m	Meter.	sec	Second.
		mL	Milliliter.		

Table 5-12. Dermal Absorption Parameters
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent of Potential Concern	ABSd (1)	Permeability Constant Kp (cm/hour) (2)	
		Value	Source
Semi-Volatile Organic Compounds			
Benzo(a)anthracene	0.13	4.7E-01	DRA
Benzo(a)pyrene	0.13	7.0E-01	DRA
Benzo(b)fluoranthene	0.13	7.0E-01	DRA
Dibenzo(a,h)anthracene	0.13	1.5E+00	DRA
Indeno(1,2,3-cd)pyrene	0.13	1.0E+00	DRA
Polychlorinated Biphenyls			
Aroclor 1254	0.06	1.3E+00	R3
Explosives			
Nitroglycerine	0.10	1.1E-03	DRA
Inorganics			
Aluminum	0.01	1.0E-03	R3
Arsenic	0.03	1.0E-03	DRA
Cobalt	0.01	1.0E-03	R3
Iron	0.01	1.0E-03	R3
Manganese	0.01	1.0E-03	R3
Nickel	0.01	2.0E-04	R3
Vanadium	0.01	1.0E-03	R3

Notes
(1) Dermal absorption efficiency for uptake of constituents from a soil matrix (unitless) (USEPA 2004
(2) Permeability coefficient for dermal contact with constituents in water (centimeters per hour).
DRA = USEPA (2004c)
R3 = USEPA Region 3 (1995, 2003)
cm = Centimeter.
L = Liter.

Table 5-13. Noncarcinogenic Toxicity Values for Oral and Dermal Exposure
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	Oral RfD (mg/kg/day) Subchronic		Oral RfD (mg/kg/day) Chronic		Adjustment Factor [a]	Dermal RfD (mg/kg/day) Subchronic	Dermal RfD (mg/kg/day) Chronic	Target Site/ Critical Effect	Confidence Level/ Uncertainty Factor
Volatile Organic Compounds									
Benzene	1.2E-02	*cx*	4.0E-03	*I*	1	1.2E-02	4.0E-03	blood	medium/300
Bromodichloromethane	2.0E-02	*H*	2.0E-02	*I*	1	2.0E-02	2.0E-02	kidney	medium/1000
Bromomethane	1.4E-02	*H*	1.4E-03	*I*	1	1.4E-02	1.4E-03	forestomach	medium/1000
1,3-Butadiene	NA		NA		1	NA	NA	NA	NA
Carbon tetrachloride	7.0E-03	*cx*	7.0E-04	*I*	1	7.0E-03	7.0E-04	liver	medium/1000
Chloroform	1.0E-02	*H*	1.0E-02	*I*	1	1.0E-02	1.0E-02	liver	medium/1000
Dibromochloromethane	2.0E-01	*H*	2.0E-02	*I*	1	2.0E-01	2.0E-02	liver	medium/1000
Ethanol	NA		NA		1	NA	NA	NA	NA
4-Ethyltoluene	NA		NA		1	NA	NA	NA	NA
Heptane	NA		NA		1	NA	NA	NA	NA
2-Hexanone	NA		NA		1	NA	NA	NA	NA
Isopropanol	NA		NA		1	NA	NA	NA	NA
Tetrachloroethene	1.0E-01	*H*	1.0E-02	*I*	1	1.0E-01	1.0E-02	liver	medium/1000
Tetrahydrofuran	NA		NA		1	NA	NA	NA	NA
Trichloroethene	NA		NA		1	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NA		NA		1	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5.0E-02	*c*	5.0E-02	*P*	1	5.0E-02	5.0E-02	NA	NA
2,2,4-Trimethylpentane	NA		NA		1	NA	NA	NA	NA
Semi-Volatile Organic Compounds									
Benzo(a)anthracene	NA		NA		1	NA	NA	NA	NA
Benzo(a)pyrene	NA		NA		1	NA	NA	NA	NA
Benzo(b)fluoranthene	NA		NA		1	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA		NA		1	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA		NA		1	NA	NA	NA	NA
Polychlorinated Biphenyls									
Aroclor 1254	5.0E-05	*H*	2.0E-05	*I*	1	5.0E-05	2.0E-05	eye, nails, immune system	medium/300
Explosives									
Nitroglycerine	1.0E-04	*c*	1.0E-04	*P*	1	1.0E-04	1.0E-04	NA	NA
Inorganics									
Aluminum	1.0E+00	*c*	1.0E+00	*P*	1	1.0E+00	1.0E+00	developmental NS	NA
Arsenic	3.0E-04	*c*	3.0E-04	*I*	1	3.0E-04	3.0E-04	skin, vascular	medium/3
Cobalt	3.0E-04	*c*	3.0E-04	*P*	1	3.0E-04	3.0E-04	skin	NA
Copper	4.0E-02	*c*	4.0E-02	*H*	1	4.0E-02	4.0E-02	GI	NA
Iron	7.0E-01	*c*	7.0E-01	*P*	1	7.0E-01	7.0E-01	blood, liver, GI	NA
Manganese [b]	1.4E-01/2.4E-02	*c*	1.4E-01/2.4E-02	*I*	0.04	5.6E-03 / 8E-04	5.6E-03 / 8E-04	CNS	medium/1
Nickel [c]	2.0E-02	*H*	2.0E-02	*I*	0.04	8.0E-04	8.0E-04	Non-specific	medium/300
Vanadium	7.0E-03	*H*	7.0E-03	*H*	0.026	1.8E-04	1.8E-04	liver	low/100

References:
A Agency for Toxic Substances Disease Registry (ATDSR) (ATSDR 2008).
H USEPA (1997b) (Health Effects Assessment Summary Tables [HEAST]).
I USEPA (2009b) Integrated Risk Information System (IRIS).
P Provisional Peer Reviewed Toxicity Values (PPRTV) (USEPA 2009c).

c = The chronic value is used if available.
CNS = Central nervous system.
GI = Gastrointestinal tract.
mg/kg/day = Milligrams per kilogram per day.
NA = Not available.
NS = Nervous system.
RfD = Reference dose.
Non-specific = Effects non-specific to a target organ, including increased mortality and changes to body weight.
x = The uncertainty factor for subchronic to chronic extrapolation was removed.

[a] The oral-to-dermal adjustment factor (oral absorption efficiency) (USEPA 2004a) was used to calculate the dermal RfD values, as follows:
RfD (dermal) = RfD (oral) × Adjustment Factor (oral absorption efficiency)
[b] RfDs for exposure via food/water consumption. The RfD for food is used to assess soil exposure. The RfD for water is used to assess groundwater ingestion.
[c] Data are for nickel (soluble salts).

Table 5-14. Noncarcinogenic Toxicity Values for Inhalation Exposure
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	Inhalation RfC (mg/m^3) Subchronic		Chronic		Target Site/ Critical Effect	Confidence Level/ Uncertainty Factor
Volatile Organic Compounds						
Benzene	2.6E-02	*cx*	3.0E-02	*I*	blood	medium/300
Bromodichloromethane	NA		NA		NA	NA
Bromomethane	1.4E-03	*H*	5.0E-03	*I*	nasal	high/100
1,3-Butadiene	2.0E-03	*c*	2.0E-03	*I*	ovaries	medium/1000
Carbon tetrachloride	1.9E-01	*c*	1.9E-01	*A*	liver	NA/30
Chloroform	9.8E-02	*c*	9.8E-02	*A*	liver, kidney, CNS	low-med/100
Dibromochloromethane	NA		NA		NA	NA
1,4-Dichlorobenzene	8.0E-01	*c*	8.0E-01	*I*	liver	medium/100
Ethanol	NA		NA		NA	NA
4-Ethyltoluene	NA		NA		NA	NA
Ethylbenzene	1.0E+00	*c*	1.0E+00	*I*	development	low/300
Heptane	NA		NA		NA	NA
2-Hexanone	NA		NA		NA	NA
Isopropanol	7.0E+00	*c*	7.0E+00	*C*	kidney, development	NA/30
Tetrachloroethene	2.7E-01	*c*	2.7E-01	*A*	NS	NA
Tetrahydrofuran	NA		NA		NA	NA
Trichloroethene	NA		NA		NA	NA
1,2,4-Trimethylbenzene	7.0E-03	*c*	7.0E-03	*P*	NA	NA
1,3,5-Trimethylbenzene	6.0E-03	*c*	6.0E-03	*P*	NA	NA
2,2,4-Trimethylpentane	NA		NA		NA	NA
Semi-Volatile Organic Compounds						
Benzo(a)anthracene	NA		NA		NA	NA
Benzo(a)pyrene	NA		NA		NA	NA
Benzo(b)fluoranthene	NA		NA		NA	NA
Dibenzo(a,h)anthracene	NA		NA		NA	NA
Indeno(1,2,3-cd)pyrene	NA		NA		NA	NA
Polychlorinated Biphenyls						
Aroclor 1254	NA		NA		NA	NA
Explosives						
Nitroglycerine	NA		NA		NA	NA
Inorganics						
Aluminum	5.0E-03	*c*	5.0E-03	*P*	NA	NA
Arsenic	1.5E-05	*c*	1.5E-05	*C*	Development	NA/30
Cobalt	NA		NA		NA	NA
Copper	NA		NA		NA	NA
Iron	NA		NA		NA	NA
Manganese	5.0E-05	*c*	5.0E-05	*I*	CNS	medium/1000
Nickel	NA		NA		NA	NA
Vanadium	NA		NA		NA	NA

References:
A Agency for Toxic Substances Disease Registry (ATDSR), obtained from Oak Ridge National Laboratory (USEPA 2008).
H USEPA (1997b) (Health Effects Assessment Summary Tables [HEAST]).
I USEPA (2009b) Integrated Risk Information System (IRIS).
P Provisional Peer Reviewed Toxicity Values (PPRTV), obtained from Oak Ridge National Laboratory (USEPA 2009c).

c = The chronic value is used if available.
CNS = Central nervous system.
mg/kg/day = Milligrams per kilogram per day.
NA = Not available.

Table 5-15. Carcinogenic Toxicity Values for Oral and Dermal Exposure
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	Oral CSF $(mg/kg/day)^{-1}$		TEF	Adjustment Factor [a]	Dermal CSF [a] $(mg/kg/day)^{-1}$	Tumor Site	Weight of Evidence Classification [b]
Volatile Organic Compounds							
Benzene	5.5E-02	*I*	–	1	5.5E-02	leukemia	A
Bromodichloromethane	6.2E-02	*I*	–	1	6.2E-02	kidney	B2
Bromomethane	NA		–	1	NA	–	D
1,3-Butadiene	3.4E+00	*C*	–	1	3.4E+00	NA	B2
Carbon tetrachloride	1.3E-01	*I*	–	1	1.3E-01	liver	B2
Chloroform	3.1E-02	*C*	–	1	3.1E-02	NA	B2
Dibromochloromethane	8.4E-02	*I*	–	1	8.4E-02	liver	C
Ethanol	NA		–	1	NA	NA	NA
4-Ethyltoluene	NA		–	1	NA	NA	NA
Heptane	NA		–	1	NA	NA	NA
2-Hexanone	NA		–	1	NA	NA	NA
Isopropanol	NA		–	1	NA	NA	NA
Tetrachloroethene	5.4E-01	*C*	–	1	5.4E-01	NA	NA
Tetrahydrofuran	NA		–	1	NA	NA	NA
Trichloroethene	1.3E-02	*C*	–	1	1.3E-02	NA	NA
1,2,4-Trimethylbenzene	NA		–	1	NA	–	NA
1,3,5-Trimethylbenzene	NA		–	1	NA	–	NA
2,2,4-Trimethylpentane	NA		–	1	NA	NA	NA
Semi-Volatile Organic Compounds							
Benzo(a)anthracene	7.3E-01	*	0.1	1	7.3E-01	stomach	B2
Benzo(a)pyrene	7.3E+00	*I*	1	1	7.3E+00	stomach	B2
Benzo(b)fluoranthene	7.3E-01	*	0.1	1	7.3E-01	stomach	B2
Dibenzo(a,h)anthracene	7.3E+00	*	1	1	7.3E+00	stomach	B2
Indeno(1,2,3-cd)pyrene	7.3E-01	*	0.1	1	7.3E-01	stomach	B2
Polychlorinated Biphenyls							
Aroclor 1254	2.0E+00	*I*	–	1	2.0E+00	liver	B2
Explosives							
Nitroglycerine	1.7E-02	*P*	–	1	1.7E-02	NA	NA
Inorganics							
Aluminum	NA		–	1	NA	–	NA
Arsenic	1.5E+00	*I*	–	1	1.5E+00	skin	A
Cobalt	NA		–	1	NA	–	NA
Iron	NA		–	1	NA	–	NA
Manganese	NA		–	0.04	NA	–	D
Nickel	NA		–	0.04	NA	NA	NA
Vanadium	NA		–	0.026	NA	–	NA

References: *C* California Environmental Protection Agency (CalEPA) (CalEPA 2009).
I USEPA (2009b) Integrated Risk Information System (IRIS).
P Provisional Peer Reviewed Toxicity Values (PPRTV), obtained from Oak Ridge National Laboratory (USEPA 2009c).

* = Benzo(a)pyrene used as a surrogate, with the application of TEF values obtained from USEPA (1993).
– = Not applicable.

CSF = Cancer slope factor.
$(mg/kg/day)^{-1}$ = Inverse milligrams per kilogram per day (risk per unit dose).
NA = Not available.
TEF = Benzo(a)pyrene toxicity equivalence factor for carcinogenic polycyclic aromatic hydrocarbons (PAHs).

[a] The oral-to-dermal adjustment factor (oral absorption efficiency) (USEPA 2004a) was used to calculate the dermal CSF values:
CSF (dermal) = CSF (oral) / Adjustment Factor (oral absorption efficiency)
[b] Weight of evidence classification defined in text.

Table 5-16. Carcinogenic Toxicity Values for Inhalation Exposure
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Constituent	Inhalation URF $(\mu g/m^3)^{-1}$		Tumor Site	Weight of Evidence Classification [a]
Volatile Organic Compounds				
Benzene	7.8E-06	*I*	leukemia	A
Bromodichloromethane	NA		–	B2
Bromomethane	NA		–	D
1,3-Butadiene	3.0E-05	*I*	multiple sites	B2
Carbon tetrachloride	1.5E-05	*I*	liver	B2
Chloroform	2.3E-05	*I*	liver	B2
Dibromochloromethane	2.7E-05	*C*	NA	C
1,4-Dichlorobenzene	1.1E-05	*C*	liver	NA
Ethanol	NA		–	NA
Ethylbenzene	2.5E-06	*C*	kidney	D
4-Ethyltoluene	NA		–	NA
Heptane	NA		–	NA
2-Hexanone	NA		–	NA
Isopropanol	NA		NA	NA
Tetrachloroethene	5.9E-06	*C*	liver, kidney	NA
Tetrahydrofuran	NA		liver, kidney	NA
Trichloroethene	2.0E-06	*C*	lung	NA
1,2,4-Trimethylbenzene	NA		–	NA
1,3,5-Trimethylbenzene	NA		–	NA
2,2,4-Trimethylpentane	NA		–	NA
Semi-Volatile Organic Compounds				
Benzo(a)anthracene	1.1E-04	*C*	respiratory	B2
Benzo(a)pyrene	2.7E-02	*C*	respiratory	B2
Benzo(b)fluoranthene	1.1E-04	*C*	respiratory	B2
Dibenzo(a,h)anthracene	1.1E-03	*C*	respiratory	B2
Indeno(1,2,3-cd)pyrene	1.1E-04	*C*	respiratory	B2
Polychlorinated Biphenyls				
Aroclor 1254	5.7E-04	*I*	liver	B2
Explosives				
Nitroglycerine	NA		–	NA
Inorganics				
Aluminum	NA		–	NA
Arsenic	4.3E-03	*I*	lung	A
Cobalt	9.0E-03	*P*	lung	NA
Iron	NA		–	NA
Manganese	NA		–	D
Nickel	NA		–	NA
Vanadium	NA		–	NA

References: *C* California Environmental Protection Agency (CalEPA) Toxicity Criteria Database (CalEPA 2009).
I USEPA (2009b) Integrated Risk Information System (IRIS).
P Provisional Peer Reviewed Toxicity Values (PPRTV), obtained from Oak Ridge National Laboratory (USEPA 2009c).

– = Not applicable.
URF = Unit risk factor.
$(\mu g/m^3)^{-1}$ = per microgram per cubic meter (risk per unit exposure concentration).
NA = Not available.

[a] Weight of evidence classification defined in text.

Figures



Source: USGS Radford North 7.5 Minute Topographic Map

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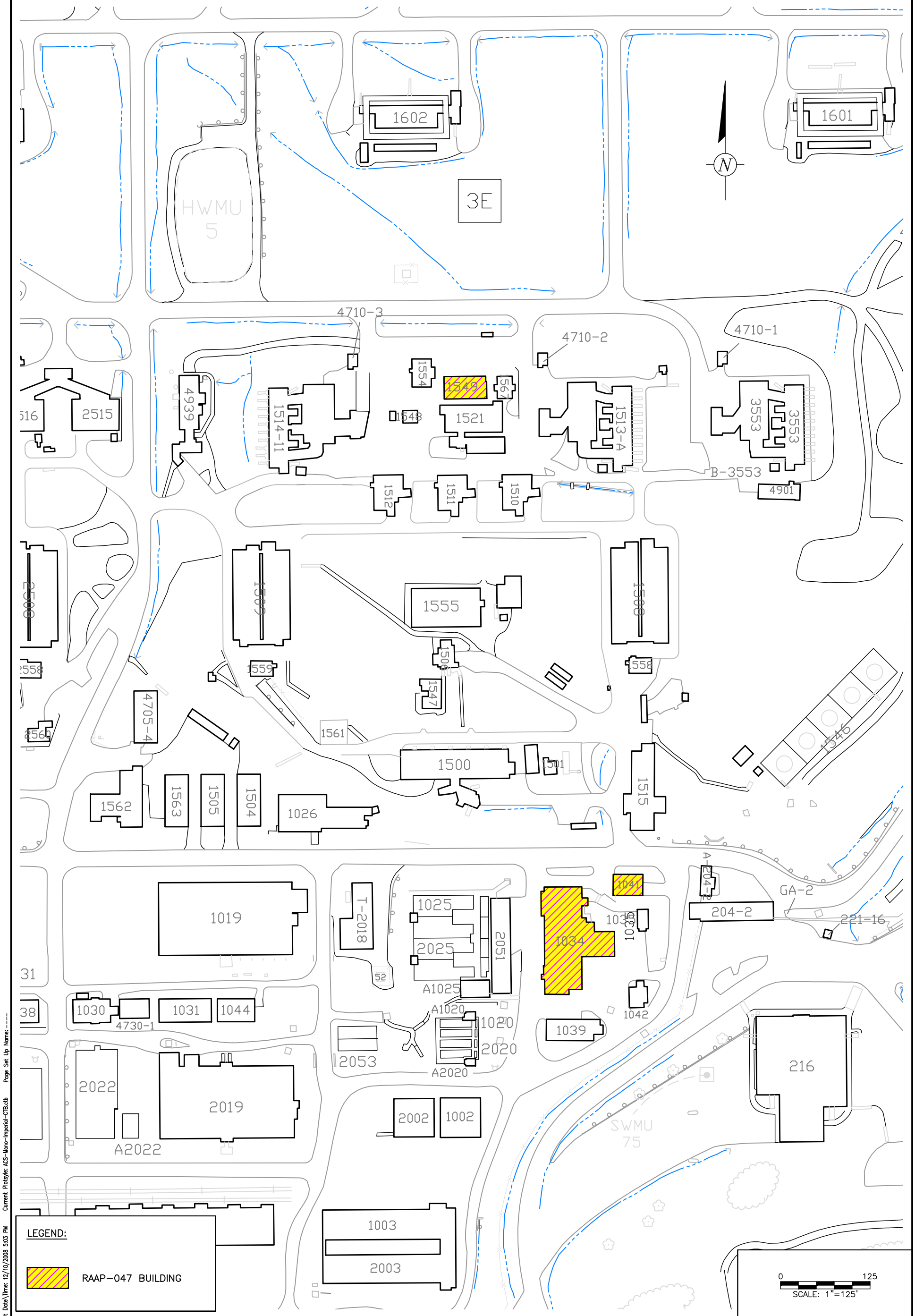
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ARMY ENVIRONMENTAL COMMAND
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SITE LOCATION

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Date	3-DEC-2008
Figure Number	1



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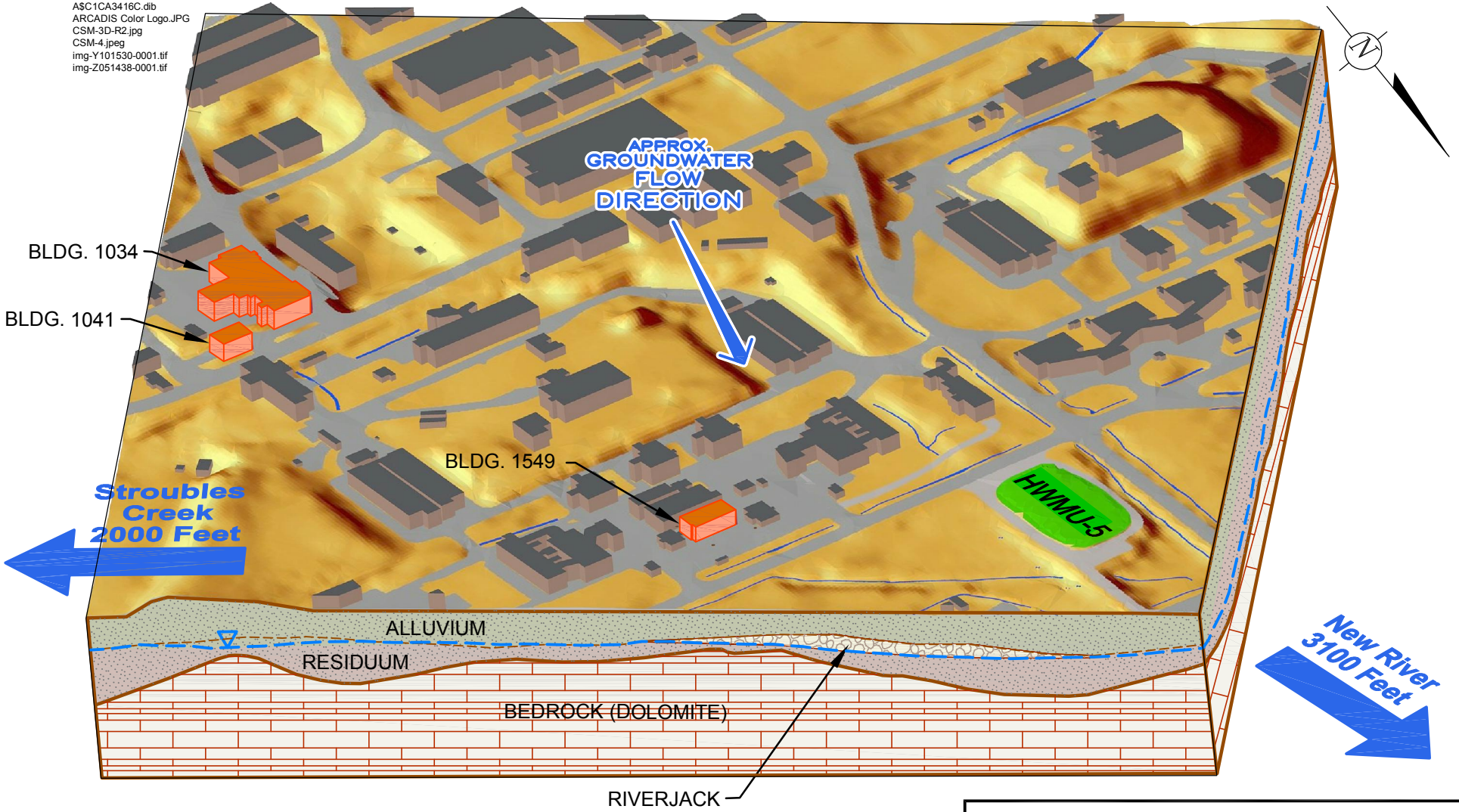
SITE LAYOUT

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	24 NOVEMBER, 2008
Figure	2

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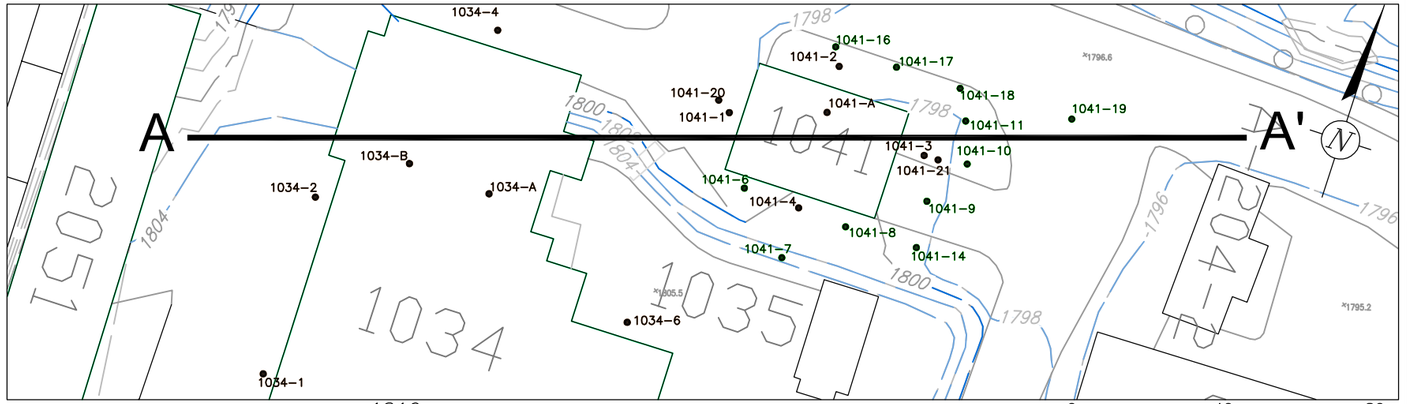


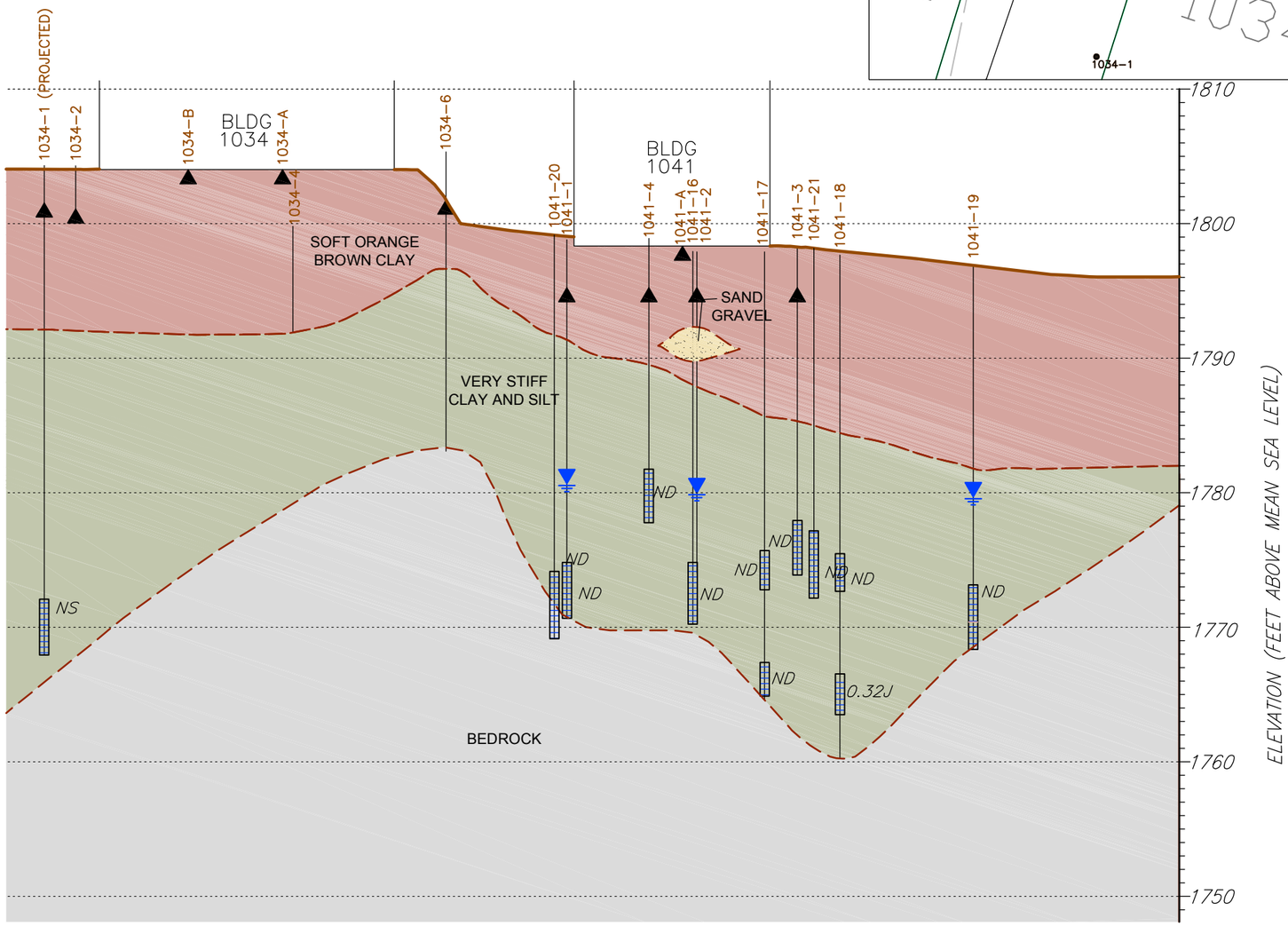
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RAAP-047 RCRA FACILITY INVESTIGATION
RADFORD ARMY AMMUNITION PLANT, RADFORD, VA

CONCEPTUAL MODEL

ARCADIS

FIGURE
3





NOTES:

- SAND GRAVEL
- VERY STIFF CLAY AND SILT
- SOFT ORANGE BROWN CLAY
- BEDROCK

1041-18
- BORING ID
- SOIL GAS SAMPLE DEPTH
- WATER TABLE(2008)
- 0.32 — CONCENTRATION OF TRICHLOROETHENE (TCE) IN GROUNDWATER IN MICROGRAMS PER LITER (ug/L)
- GROUNDWATER SAMPLE INTERVAL

ND = TCE NOT DETECTED

J = REPORTED TCE CONCENTRATION IS AN ESTIMATED VALUE

NS = SAMPLE NOT OBTAINED DUE TO LOW AQUIFER YIELD

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0 10 20
VERTICAL: 1"=10'

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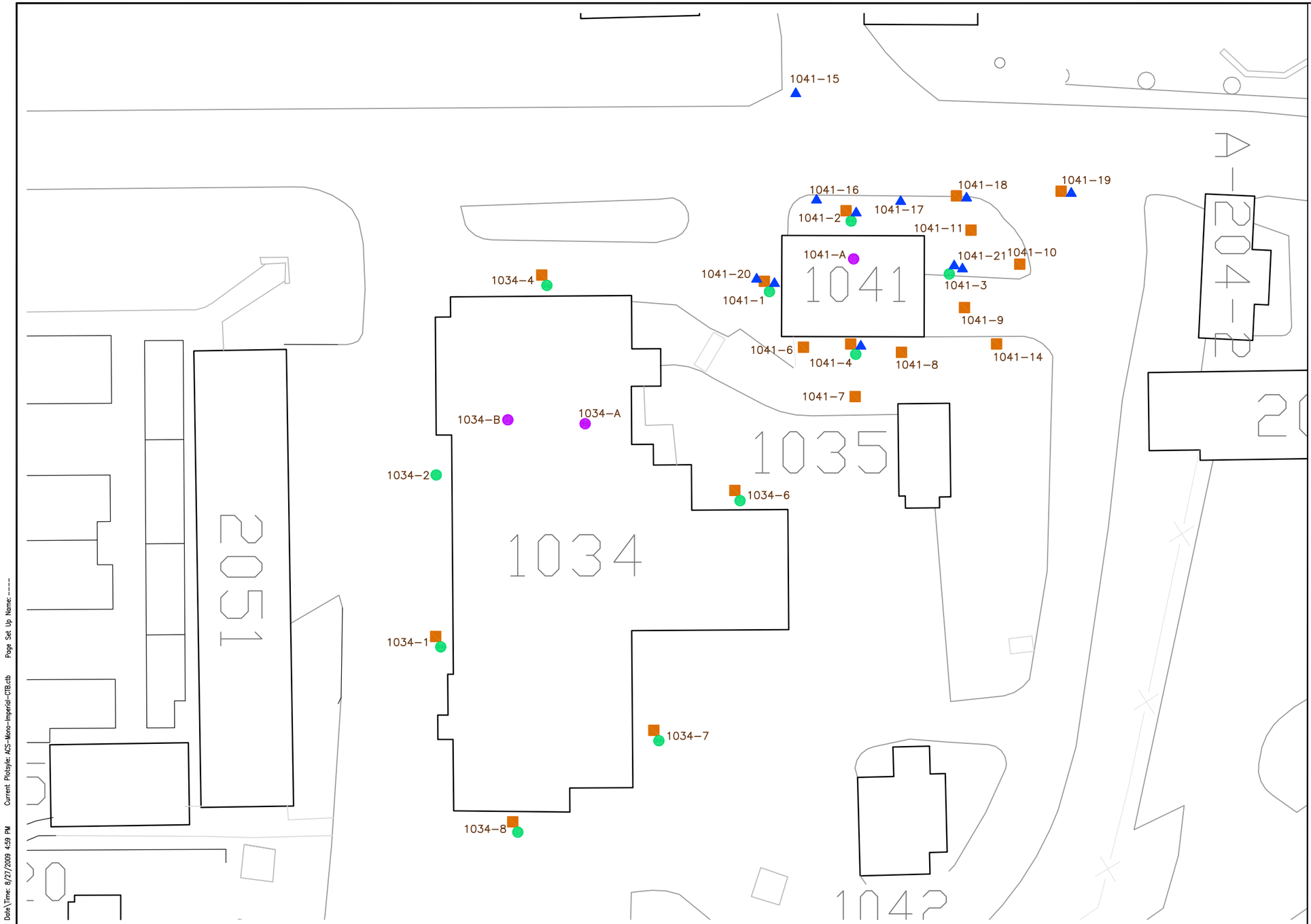
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ARMY ENVIRONMENTAL COMMAND
RAAP-047 RCRA FACILITY INVESTIGATION

CROSS SECTION A-A'

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	05 DECEMBER, 2008
Figure	4



LEGEND:

1041–A	SUBSLAB SOIL GAS SAMPLE LOCATION
1041–1	SOIL GAS SAMPLE LOCATION
1041–3	SOIL SAMPLE LOCATION
1041–4	GROUNDWATER SAMPLE LOCATION

NOTE:

1. AT LOCATIONS WITH MULTIPLE SYMBOLS, MORE THAN ONE MEDIUM WAS SAMPLED.
2. ALL LOCATIONS ARE APPROXIMATE

0 30
SCALE: 1"=30'

Path\Name: G:\APROJECT\RAAP\CADD\RAAP-047\RFI FIGURES\2009-08-28 Revs\FIG-5 INVESTIGATION LOCATIONS AT BLDG 1034, 1041.dwg
Plot Date\Time: 8/27/2009 4:59 PM Current Plotstyle: ACS-Mono-Imperial-CTB.ctb Page Set Up Name: ----
Acad Version: 17.1s (LMS Tech)
User Name: Wasilewski, Matt

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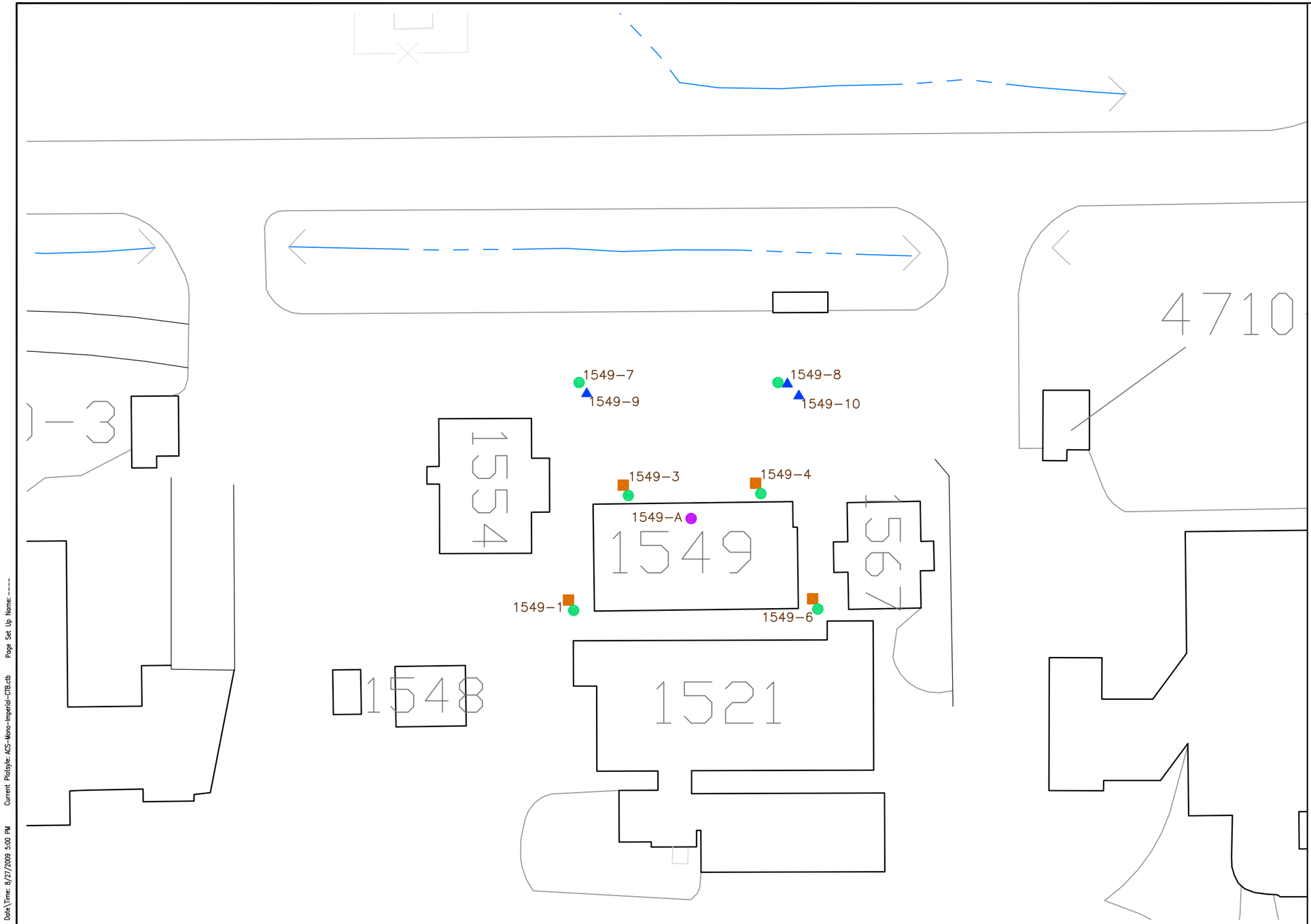
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ARMY ENVIRONMENTAL COMMAND
RAAP-047 RCRA FACILITY INVESTIGATION

INVESTIGATION LOCATIONS AT BUILDING 1034 & 1041

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	5 DECEMBER, 2008
Figure	5



LEGEND:

- 1549-A — SUBSLAB SOIL GAS SAMPLE LOCATION
- 1549-3 — SOIL GAS SAMPLE LOCATION
- 1549-4 — SOIL SAMPLE LOCATION
- 1549-8 — GROUNDWATER SAMPLE LOCATION

NOTE:

1. AT LOCATIONS WITH MULTIPLE SYMBOLS, MORE THAN ONE MEDIUM WAS SAMPLED.
2. ALL LOCATIONS ARE APPROXIMATE

0 30
SCALE: 1"=30'

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Path\Name: G:\PROJECT\RAAP\CADD\RAAP-047\RFI FIGURES\2009-06-28 Revs\FIG-6 INVESTIGATION LOCATIONS AT BLDG 1549.dwg
Plot Date\Time: 8/27/2009 5:00 PM Current Plotstyle: ACS-Mono-Imperial-CTB.ctb Page Set Up Name: ----

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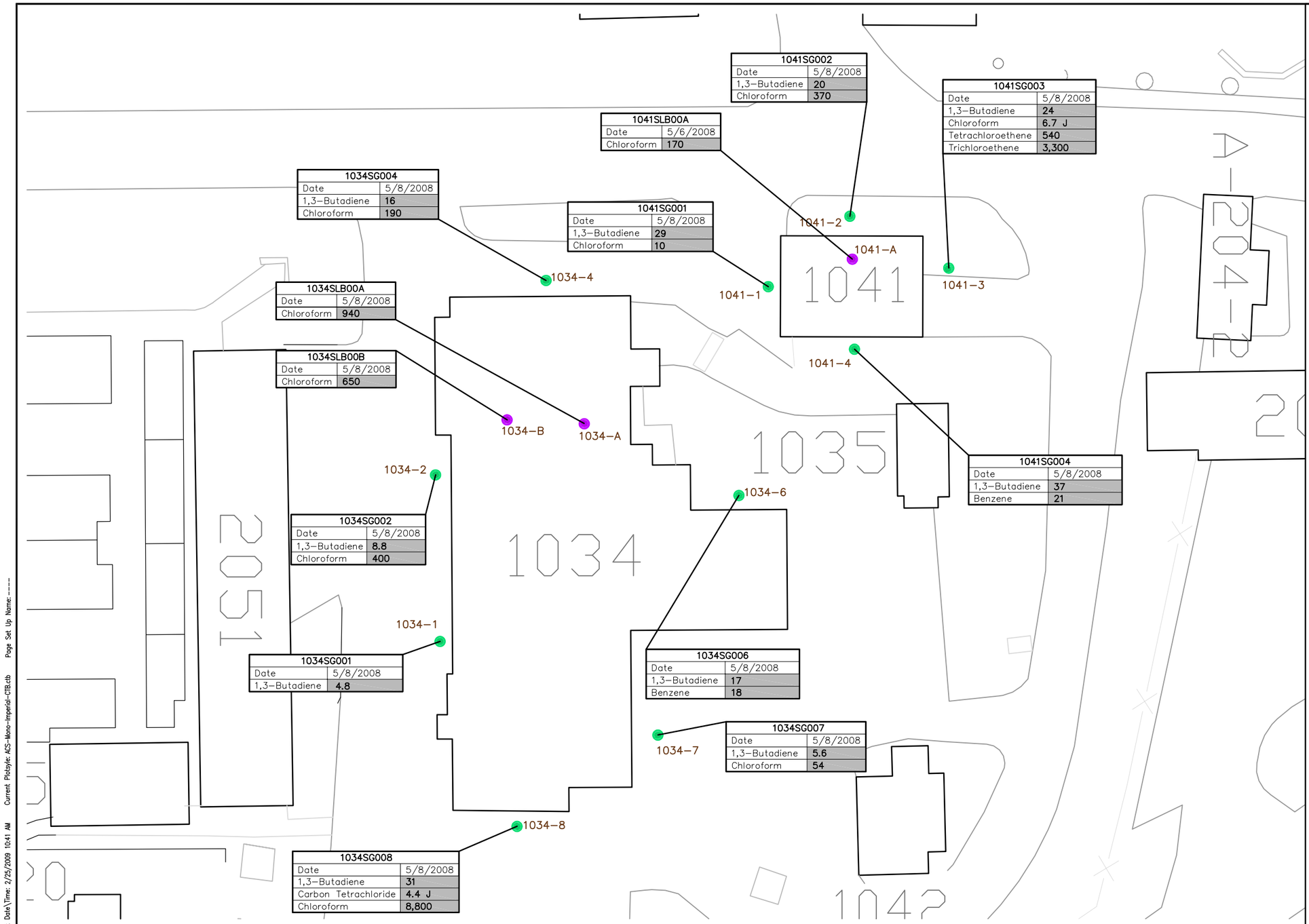
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RAAP-047 RCRA FACILITY INVESTIGATION

INVESTIGATION LOCATIONS AT BUILDING 1549

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	24 NOVEMBER, 2008
Figure	6



Path\Name: G:\PROJECT\RAAP\CADD\RAAP-047\RFI FIGURES\FIG-7 PRELIMINARY RESULTS - SG - 1034, 1041.dwg
Plot Date\Time: 2/25/2009 10:41 AM Current Plotstyle: ACS-Mono-Imperial-CTB.ctb Page Set Up Name: ----
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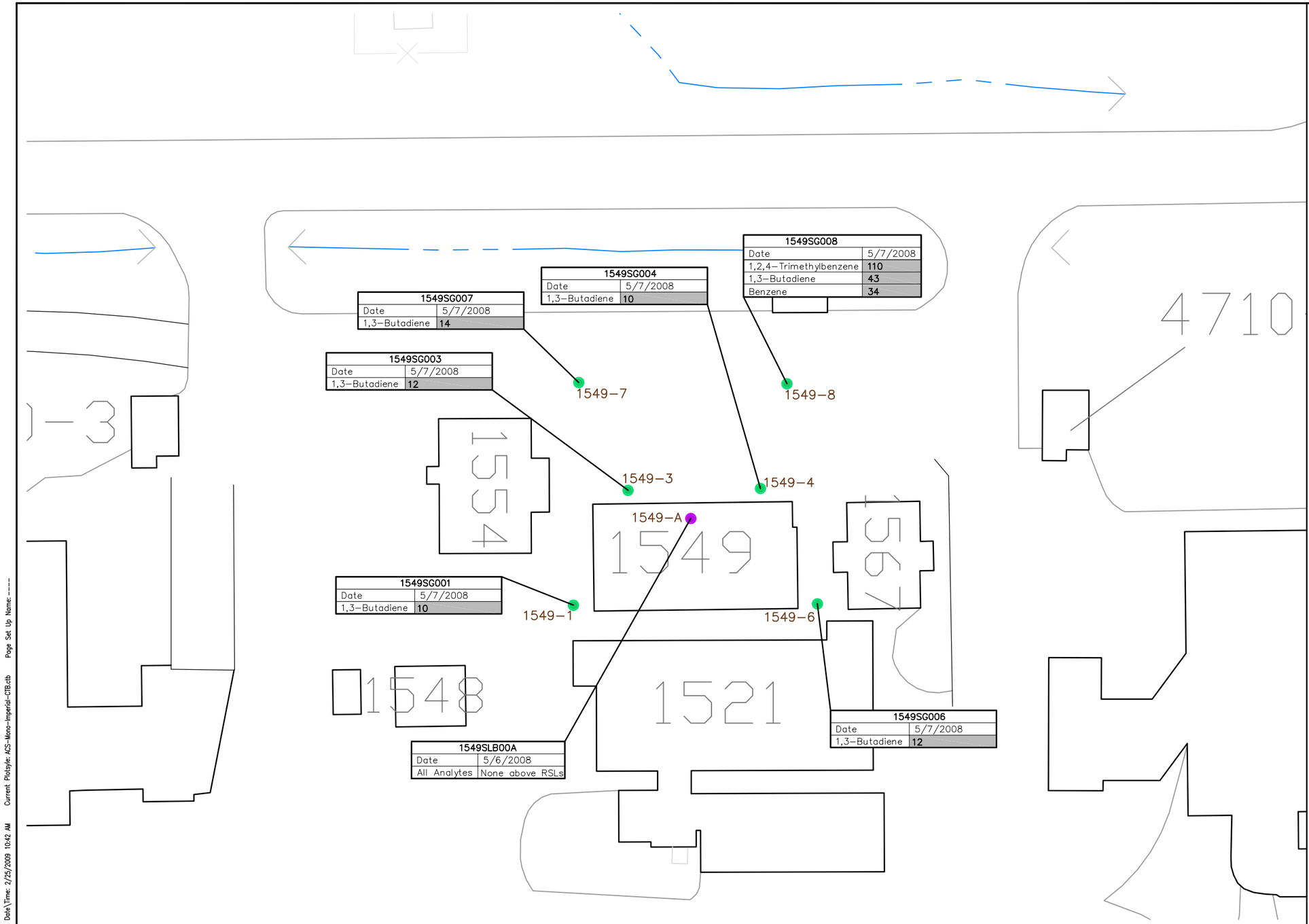
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ARMY ENVIRONMENTAL COMMAND
RAAP-047 RCRA FACILITY INVESTIGATION

SOIL GAS SAMPLING RESULTS BUILDINGS 1034 & 1041

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	24 NOVEMBER, 2008
Figure	7



LEGEND:

1549–A ● SUBSLAB SOIL GAS SAMPLE LOCATION

1549–3 ● SOIL GAS SAMPLE LOCATION

SAMPLE ID

SAMPLE DATE

1549SG008	
Date	5/7/2008
1,3–Butadiene	43

CONSTITUENT

CONCENTRATION (IN MICROGRAMS PER CUBIC METER, BOLD AND SHADED INDICATES CONCENTRATION ABOVE INDUSTRIAL AIR REGIONAL SCREENING LEVEL)

NOTES:

1. ALL RESULTS IN ug/m³
2. NONE ABOVE RSLs – NO REPORTED RESULTS ARE GREATER THAN INDUSTRIAL AIR REGIONAL SCREENING LEVELS.

0 30

SCALE: 1"=30'

Acad Version: 17.1s (LMS Tech) User Name: Wesilewski, Matt
Path\Name: G:\PROJECT\RAAP\CADD\RAAP-047\RFI FIGURES\FIG-8 PRELIMINARY RESULTS - SG -1549.dwg Plot Date\Time: 2/25/2009 10:42 AM Current Plotstyle: ACS-Mono-Imperial-CTB.ctb Page Set Up Name: ----
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ARMY ENVIRONMENTAL COMMAND

RAAP-047 RCRA FACILITY INVESTIGATION

SOIL GAS SAMPLING RESULTS BUILDING 1549

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	24 NOVEMBER, 2008
Figure	8

1041SB003		
Depth(Feet)	(0.5 – 1.5)	(7 – 8)
Date	5/9/2008	5/9/2008
All Analytes	None above RSLs	None above RSLs

1041SB018	
Depth(Feet)	(6 – 7)
Date	6/27/2008
All Analytes	None above RSLs

1041SB002		
Depth(Feet)	(1 – 2)	(7 – 8)
Date	5/8/2008	5/8/2008
All Analytes	None above RSLs	None above RSLs

1041SB011	
Depth(Feet)	(8 – 9)
Date	6/26/2008
All Analytes	None above RSLs

1041SB001		
Depth(Feet)	(0.5 – 1.5)	(7 – 8)
Date	5/9/2008	5/9/2008
Inorganics		
Manganese	3,300	1,530 J

1041SB019	
Depth(Feet)	(6 – 7)
Date	6/27/2008
All Analytes	None above RSLs

1034SB004		
Depth(Feet)	(0.5 – 1.5)	(5 – 6)
Date	5/8/2008	5/8/2008
All Analytes	None above RSLs	None above RSLs

1041006	
Depth(Feet)	(0.5 – 1)
Date	6/25/2008
All Analytes	None above RSLs

1041SB010	
Depth(Feet)	(7 – 8)
Date	6/26/2008
All Analytes	None above RSLs

1041SB009	
Depth(Feet)	(7 – 8)
Date	6/26/2008
All Analytes	None above RSLs

1041SB014	
Depth(Feet)	(6 – 7)
Date	6/26/2008
All Analytes	None above RSLs

1041008	
Depth(Feet)	(0.5 – 1)
Date	6/25/2008
All Analytes	None above RSLs

1041SB004		
Depth(Feet)	(0 – 1)	(7 – 8)
Date	5/8/2008	5/8/2008
PCBS		
Aroclor–1254	0.21*	< 0.024

1041007	
Depth(Feet)	(0.5 – 1)
Date	6/25/2008
All Analytes	None above RSLs

1034SB001		
Depth(Feet)	(0.5 – 1.5)	(7 – 8)
Date	5/8/2008	5/8/2008
All Analytes	None above RSLs	None above RSLs

1034SB006		
Depth(Feet)	(0.5 – 1.5)	(7 – 8)
Date	5/9/2008	5/9/2008
All Analytes	None above RSLs	None above RSLs

1034SB008		
Depth(Feet)	(0.5 – 1.5)	(4 – 5)
Date	5/8/2008	5/8/2008
SVOCs		
Benzo(a)anthracene	1.8	2.6
Benzo(a)pyrene	3.0	4.0
Benzo(b)fluoranthene	2.7	4.0 J
Dibenzo(a,h)anthracene	2.2	1.2
Indeno(1,2,3–cd)pyrene	2.8	2.3

1034SB007		
Depth(Feet)	(0.5 – 1.5)	(7 – 8)
Date	5/9/2008	5/9/2008
All Analytes	None above RSLs	None above RSLs

1041–1 1041–2 1041–3 1041–4 1041–6 1041–7 1041–8 1041–9 1041–10 1041–11 1041–14 1041–18 1041–19

1034–1 1034–4 1034–6 1034–7 1034–8

1041 1035 1034 1042

LEGEND:

1041–3 SOIL SAMPLE LOCATION

SAMPLE ID

SAMPLE DATE

1041SB001		
Depth(Feet)	(0.5 – 1.5)	(7 – 8)
Date	5/9/2008	5/9/2008
Inorganics		
Manganese	3,300	1,530 J

CONSTITUENT

CONCENTRATION (IN MILLIGRAMS PER KILOGRAM, BOLD AND SHADED INDICATES CONCENTRATION ABOVE INDUSTRIAL SOIL REGIONAL SCREENING LEVEL)

NOTES:

1. ALL RESULTS IN mg/kg
2. NONE ABOVE RSLs – NO REPORTED RESULTS ARE GREATER THAN INDUSTRIAL REGIONAL SOIL SCREENING LEVELS.
3. * THE AROCLOR 1254 CONCENTRATION AT SAMPLE 10415B004 (0–1) WAS GREATER THAN SOIL–TO–GROUNDWATER SCREENING LEVELS (DAF 20). THE CONCENTRATION WAS LESS THAN INDUSTRIAL REGIONAL SCREENING LEVELS.
4. METALS CONCENTRATIONS GREATER THAN SCREENING LEVELS NOT SHOWN IF LESS THAN ESTABLISHED FACILITY–WIDE BACKGROUND.

0 30

SCALE: 1"=30'

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Task Manager: C. SHARPE

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ARMY ENVIRONMENTAL COMMAND
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SOIL SAMPLING RESULTS BUILDINGS 1034 & 1041

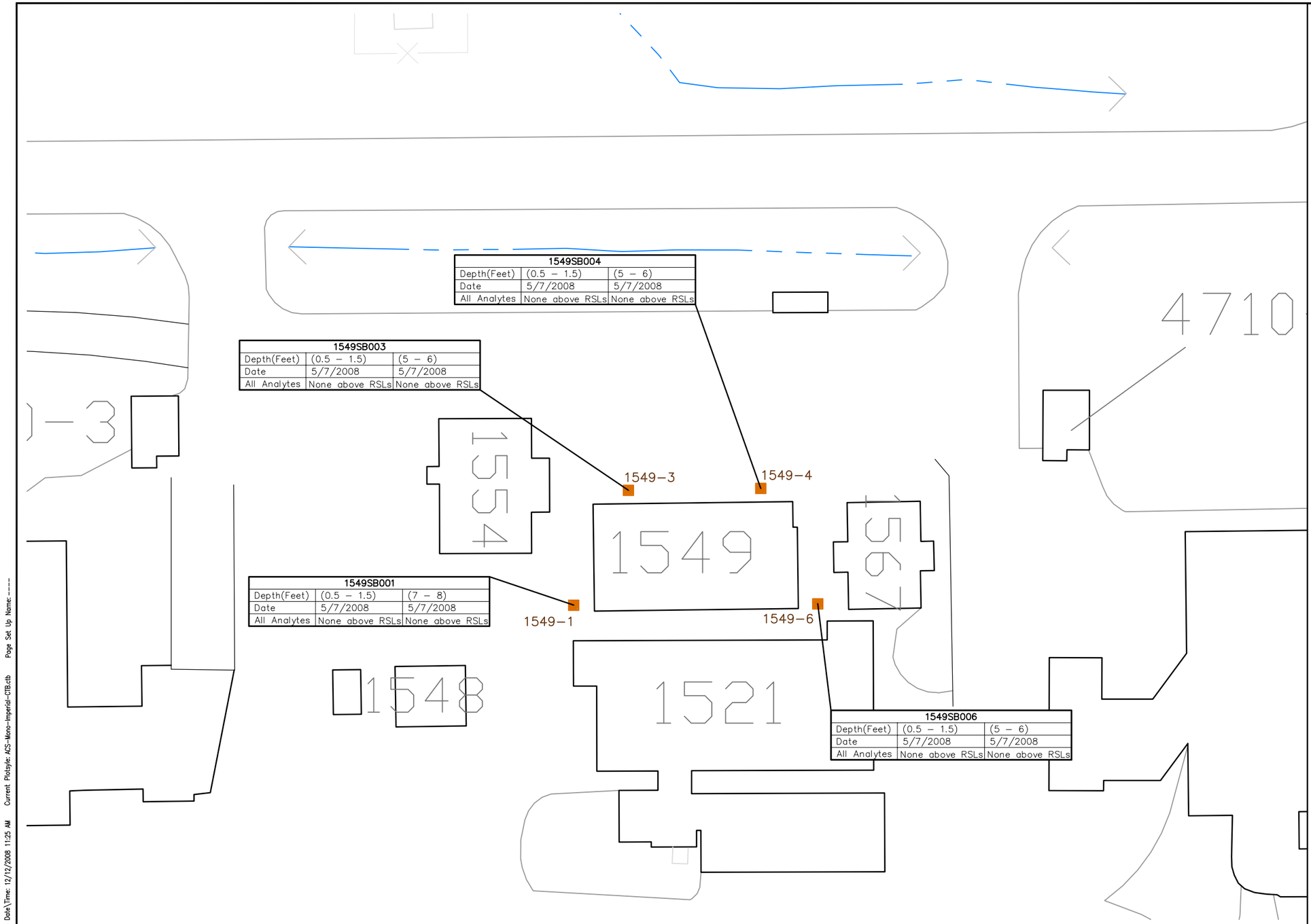
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number: GP08RAAP.0047

Drawing Date: 24 NOVEMBER, 2008

Figure: 9

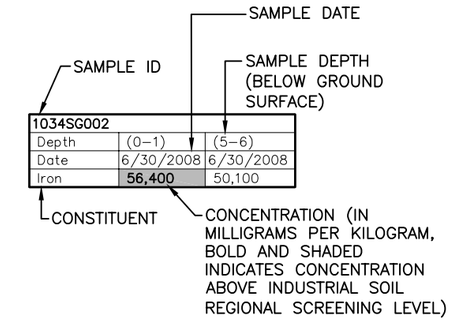
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Acad Version: 17.1s (LMS Tech) User Name: Wasilewski, Matt



N

LEGEND:

1549–4 ■ SOIL SAMPLE LOCATION



NOTES:

1. NO SOIL CONCENTRATIONS AT BUILDING 1549 WERE ABOVE INDUSTRIAL SOIL SCREENING CRITERIA OR (FOR METALS) ESTABLISHED FACILITY–WIDE BACKGROUND.
2. METALS CONCENTRATIONS GREATER THAN SCREENING LEVELS NOT SHOWN IF LESS THAN ESTABLISHED FACILITY–WIDE BACKGROUND.
3. NONE ABOVE RSLs – NO REPORTED RESULTS ARE GREATER THAN INDUSTRIAL REGIONAL SOIL SCREENING LEVELS.

0 30
SCALE: 1"=30'

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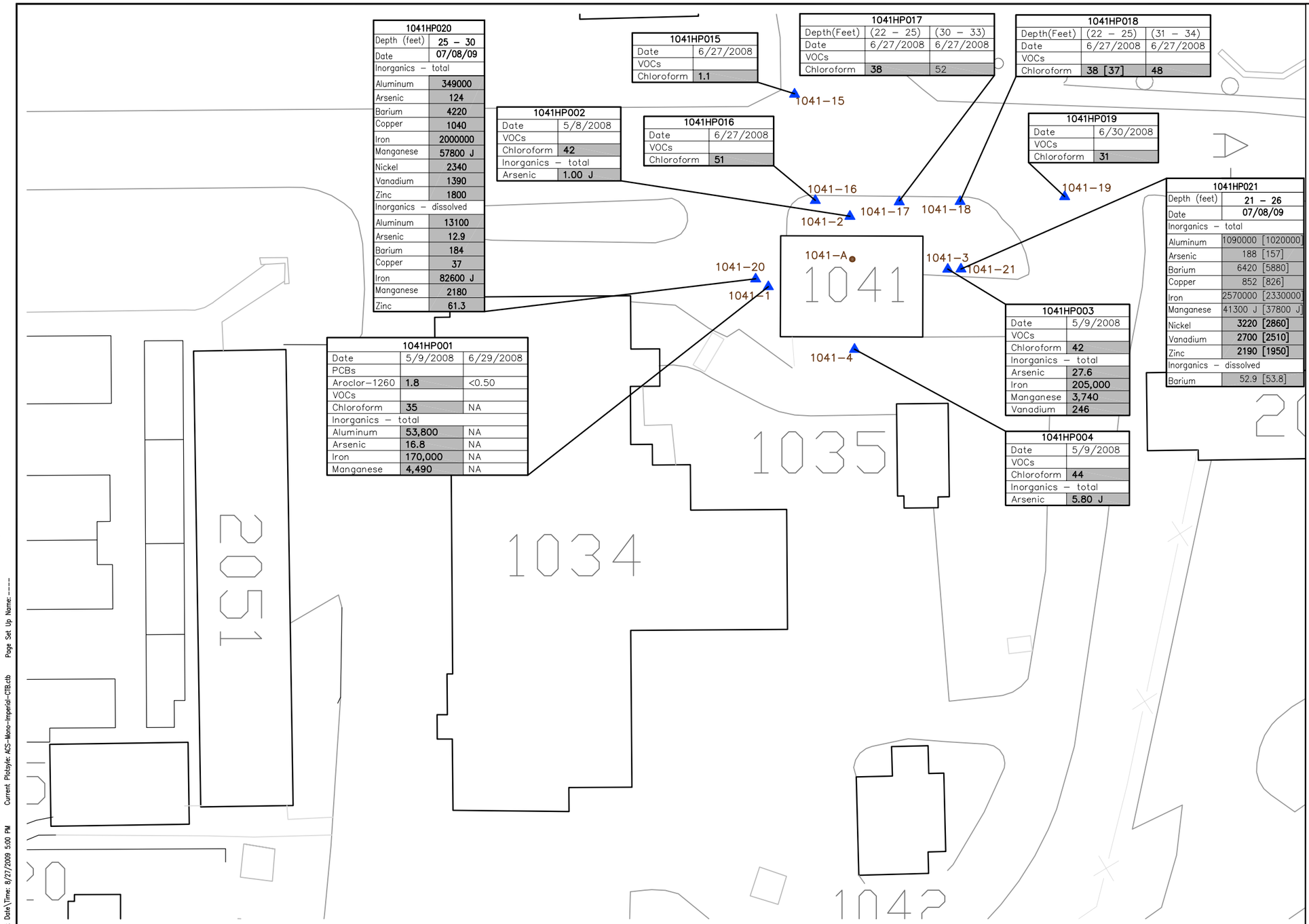
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RAAP-047 RCRA FACILITY INVESTIGATION

SOIL SAMPLING RESULTS BUILDING 1549

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

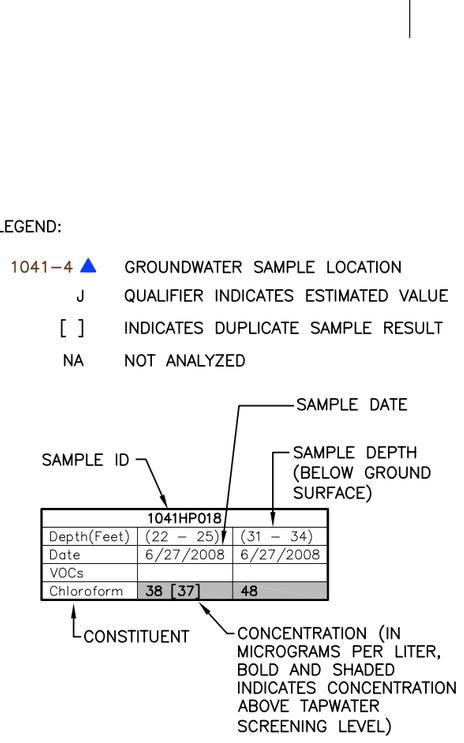
Project Number: GP08RAAP.0047
Drawing Date: 24 NOVEMBER, 2008
Figure: 10

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Plot Date\Time: 12/12/2008 11:25 AM Current Plotstyle: ACS-Mono-Imperial-CTB.ctb Page Set Up Name: ----



LEGEND:

1041–4 ▲		GROUNDWATER SAMPLE LOCATION
	J	QUALIFIER INDICATES ESTIMATED VALUE
	[ ]	INDICATES DUPLICATE SAMPLE RESULT
	NA	NOT ANALYZED



NOTES:

1. ALL RESULTS IN ug/L
2. SHADED VALUES ARE GREATER THAN TAPWATER SCREENING LEVELS.
3. NO GROUNDWATER SAMPLES WERE COLLECTED AT BUILDING 1034.
4. DISSOLVED INORGANICS ANALYZED FROM FIELD FILTERED (0.45 MICRON) SAMPLES. ALL OTHER ANALYTES ANALYZED FROM UNFILTERED SAMPLES.

0 30
SCALE: 1"=30'

Path\Name: G:\PROJECT\RAAP\CADD\RAAP-047\RFI FIGURES\2009-08-26 Revs\FIG-11 PRELIMINARY RESULTS - GW - 1034, 1041.dwg
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User Name: Weslewski, Matt
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ARMY ENVIRONMENTAL COMMAND
RAAP-047 RCRA FACILITY INVESTIGATION

GROUNDWATER SAMPLING RESULTS BUILDINGS 1034 & 1041

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	24 NOVEMBER, 2008
Figure	11

1549 HP009	
Depth (feet)	19 – 29
Date	07/08/09
Inorganics – total	
Aluminum	3600000
Arsenic	1380
Barium	11500
Beryllium	212
Cadmium	123 J
Copper	4890
Iron	6150000
Manganese	95700 J
Mercury	5
Nickel	6390
Vanadium	5950
Zinc	4990
Inorganics – dissolved	
Barium	96.5

1549 HP008	
Date	5/10/2008
Inorganics – dissolved	
Aluminum	179,000
Arsenic	35.0
Iron	197,000
Manganese	7,660
Vanadium	353

1549 HP010	
Depth (feet)	20 – 30
Date	07/08/09
Inorganics – total	
Aluminum	1460000
Arsenic	935
Barium	5320
Beryllium	102
Cadmium	21.7 J
Copper	2450
Iron	3530000
Manganese	69100 J
Mercury	2.6
Nickel	3050
Vanadium	2930
Zinc	12300
Inorganics – dissolved	
Barium	84.4

1549–9

1549–8

1549–10

4710

1549

1548

1521

LEGEND:

1549–8 ▲ GROUNDWATER SAMPLE LOCATION

SAMPLE ID — SAMPLE DATE

1549 HP008	
Date	5/10/2008
Inorganics	
Aluminum	179,000
Arsenic	35.0
Iron	197,000
Manganese	7,660
Vanadium	353

CONSTITUENT

CONCENTRATION (IN MICROGRAMS TO LITER, BOLD AND SHADED INDICATES CONCENTRATION ABOVE TAPWATER SCREENING LEVEL)

NOTES:

1. ALL RESULTS IN ug/L
2. SHADED VALUES ARE GREATER THAN TAPWATER SCREENING LEVELS.
3. DISSOLVED INORGANICS ANALYZED FROM FIELD FILTERED (0.45 MICRON) SAMPLES. ALL OTHER ANALYTES ANALYZED FROM UNFILTERED SAMPLES.

0 30

SCALE: 1"=30'

Path\Name: C:\APROJECT\RAAP\CADD\RAAP-047\RFI FIGURES\2009-08-28 Revs\FIG-12 PRELIMINARY RESULTS - GW -1549.dwg
Plot Date\Time: 8/27/2009 5:01 PM Current PlotStyle: ACS-Mono-Imperial-CTB.ctb Page Set Up Name: ----
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ARMY ENVIRONMENTAL COMMAND
RAAP-047 RCRA FACILITY INVESTIGATION

GROUNDWATER SAMPLING RESULTS BUILDING 1549

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Project Number	GP08RAAP.0047
Drawing Date	24 NOVEMBER, 2008
Figure	12

Appendix A

Historical Documentation of Potential Solvent Use

Reprinted from draft *Alternate Source Demonstration for Trichloroethene*, Draper Aden Associates, April 2007

ATK
ALLIANT TECHSYSTEMS

Fax Cover Sheet

Radford Army Ammunition Plant
PO Box 1, Route 114
Radford, VA 24141-0100

DATE	TIME	PAGES TO FOLLOW	☐ URGENT
1-4-00			

TO	COMPANY
Andy Karsnak	Draper Aden

ADDRESS	

TELEPHONE	FAX
	552 0291

FROM	TELEPHONE	FAX
Jerry Ridder		

NOTE: IF YOU DID NOT RECEIVE A CLEAR TRANSMISSION, PLEASE CALL THE SENDER

COMMENTS

Gary did some looking into possible TCE source. Not much but we can continue to look.

AF-447 PC REV 4/99

00-112

c: Jake
Bolden
B. Jennings
ENV file

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
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http://www.deq.state.va.us

Dennis H. Treacy
Director

(804) 698-4000
1-800-592-5482

1-04-2001
Spoke w/ Bill Bryles about Bldg. 1041 Degreaser House,
- said that he had limited personal knowledge because Scale Shop mainly used this bldg. but that sometimes scales would be brought outside if washed off
- reminded me that Bldg. 1034 was once a laboratory
- said best he could recall was that maintenance shops @ B-line did cleaning & washing of equipment
- said people that worked in these areas are "gone"

December 18, 2000

Ms. Carolyn Jake, Environmental Manager
Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114; P.O. Box 1
Radford, VA 24141-0100

RE: October 18 and October 25 Letters From Alliant
October 31 Conference Meeting Between Alliant and the Department
Hazardous Waste Management Unit 5, Radford Army Ammunition Plant (RAAP), Radford
EPA ID#: VA1210020730

Dear Ms. Jake:

Thank you for talking with the Department's staff on October 31, 2000. As we agreed, RAAP will send the Department more information and materials on the Correction Action Program within the 90 days. After receiving the proposed corrective action program information, the Department will review and offer comments and future recommendations.

Please be advised that if the RAAP believes that TCE was not caused by Unit 5, the RAAP needs demonstrate that fact. Also, emphasizing again, in addition to TCE there are some other hazardous constituents whose concentrations have exceeded their proposed groundwater protection standards. The RAAP has to propose the corrective action methods for all these exceeding constituents in the corrective action program.

Bldg. 1041 Degreaser House

TEC (Trichloroethane 1,1,1) INVESTIGATION
SITE 5

1-4-2001

- Spoke with a senior instrument mechanic this morning about past practices of using Bldg. 1041 Degreaser House. He said that he remembered that the Scale Shop used this to clean scales and that sometimes the scales would be brought outside of the bldg. to be washed off. He reminded me that Bldg. 1034 was once a laboratory.
- Visited Bldg. 1041. Was shown about the bldg. and was pointed out where the old dip tank was located in the floor (now filled with concrete) and where there is now a pit with a grating and a drain that goes to and outside underground tank (RFA 25275). Was shown the Procedure that relates to using Solvents, 4-27-078 (dated 1-13-1999). This procedure mentions Trichloroethane 1,1,1 as a Material.
- Spoke with four Area Mechanics who had worked in B-Line Maintenance. I was told that in the early 1960's and 1970's they cleaned equipment with Varsol and WD-40 and disposed of the used solvents by pouring them down the nearest floor drain. This disposal practice was later changed to pouring used solvents into a barrel to be hauled off by Roads & Ground,
- Located Procedure No. 4-27-78 Rev. O Chg. 0 (dated 5-23-72) which replaced SOP 78, in the Procedure History File at Bldg. 215. This procedure has Trichloroethane 1,1,1 listed in the Materials and Equipment section.
- Marked up a drawing showing the location of buildings that are suspected to have used TEC in the past due to it's degreasing properties:

  The buildings are:

1034	originally used as a laboratory
2549	Area Maintenance Shop
1549	Area Maintenance Shop
525	Tractor Steaming Station
2570	Area Cleaning Station
1041	Degreaser House (note: Sheet 24 of the Sewers & Drains Atlas shows a 4" TC line going out of the west end of the building

HERCULES INCORPORATED
RADFORD ARMY AMMUNITION PLANT
MAINTENANCE DEPARTMENT
MAINTENANCE OPERATING PROCEDURE

AREA: PLANT WIDE - GENERAL
TASK: MAINTENANCE
TITLE: CLEANING SOLVENTS

PROCEDURE NO.: 4-27-78 REV. 0 CHG. 0

TYPE: N/A TOTAL PAGES: 7

This document supersedes: SOP 78

1. SCOPE

1.1 Cleaning solvents, when used properly, are effective tools for cleaning many types of equipment and machinery. However, some solvents, particularly those of the chlorinated hydrocarbon type, can become dangerous if used carelessly or improperly. The solvents approved for use on this plant can be effectively used with a minimum of danger to personnel if basic precautions are observed in their use, handling, and limitations. No solvent, other than those listed in this procedure, shall be used by personnel in the Maintenance Department until approved for use by the Maintenance Superintendent.

1.2 Safety precautions and characteristics of the different types of approved solvents are listed in this procedure.

2. REQUIREMENTS - N/A

3. APPLICABLE DOCUMENTS - N/A

4. MATERIALS AND EQUIPMENT

4.1 Stoddard type solvents
4.2 Trichloroethane 1,1,1 - inhibited)
4.3 DuPont Cleaning Solvent #49
4.4 Acetone
4.5 Ethyl alcohol
4.6 Carbon tetrachoride
4.7 Freon TF
4.8 Benzene
4.9 Butyl alcohol
4.10 Nitroglycerin remover
4.11 Gunk

OBSOLETE COPY

5. SAFETY

5.1 GENERAL PRECAUTIONS

5.1.1 Skin Protection

5.1.1.1 Solvents, because of their composition, act as "degreasing" agents, which is one of their primary uses. Since they are good degreasers, solvents contacting the skin will remove the natural oil of the skin and thereby cause it to dry out and crack. Rubber gloves provide the best protection.

Prepared By: H. B. Brown III
Approved: 5-23-72

Proc. Number: 4-27-078 Rev No: 5	Title: 4-27-078 Cleaning Solvents
Type:	Approval: Issued Date: Revised Date: 01/13/1999
Area: Maintenance Unit: <All> Section: <All>	

Step Number	Description
 *Revision*	**REASON FOR REVISION** To make PSM compliant.
 *Revision*	**LEVEL OF TRAINING REQUIRED FOR THIS REVISION** Level 1
1.0	**SCOPE**
1.1	Cleaning solvents when used properly are effective tools for cleaning many types of equipment and machinery. However, some solvents, particularly those of the chlorinated hydrocarbon type, can become dangerous if used carelessly or improperly. The solvents approved for use on this plant can be effectively used with a minimum of danger if basic precautions are used.

Step Number	Description

2.0 REQUIREMENTS

2.1 If at any time the operator feels that any safety/quality requirements are not being met, they have authority to stop operations and notify supervision immediately.



Revision

3.0 APPLICABLE DOCUMENTS

3.1 Management Manual Safety Procedure 9-1.13 , Handling Flammable Liquids

4.0 MATERIALS AND EQUIPMENT

4.1 MATERIALS



Revision

a. Stoddard type solvents
b. Trichloroethane 1,1,1 (inhibited)
c. DuPont Cleaning Solvent #49
d. Acetone
e. Ethyl alcohol
f. Inhibisol
g. Intex 827
h. Butyl alcohol
i. Nitroglycerin remover
j. Gunk
k. Paint stripper
l. Varsol
m. Lectra Clean

Step Number	Description
	n. Voltz

WARNING

Trichloroethane or methylene chloride shall not be used in any type of pressurized system due to a reaction between the materials and galvanized or aluminum parts.

5.0 SAFETY

5.1 GENERAL PRECAUTIONS

5.1.1 Skin Protection

5.1.1.1 Solvents, because of their composition, act as "degreasing" agents, which is one of their primary uses. Since they are good degreasers, solvents contacting the skin will remove the natural oil of the skin and thereby cause it to dry out and crack. Rubber gloves provide the best protection.

Step Number	Description
5.1.1.2	Sometimes it is not practical to use gloves and the worker must depend on good hygiene practices for protection. A clean solvent by itself would not normally cause infection but, by causing the skin to crack, it has thus opened a path for infection from other sources. By washing the hands and other affected areas immediately after exposure and applying a hand lotion or other skin oil replacing substance, the cracking of the skin can be prevented or lessened.
5.1.2	Eye Protection
5.1.2.1	Chemical goggles over safety glasses shall be worn when working with quantities of solvent large enough to create a splashing hazard from handling or brushing.
5.1.3	Respirator Protection and Ventilation
5.1.3.1	Solvents shall not be used in tightly closed rooms unless there is sufficient forced ventilation.

Step Number	Description

WARNING

If the concentration of solvent vapors in the working area atmosphere causes headaches, undue fatigue or nausea, inadequate ventilation is indicated.

5.1.3.2 Solvents shall be stored and handled in approved containers and the containers shall remain covered when not in actual use.

5.1.3.3 Solvent containers or washing troughs shall not be located so that the forced or natural air currents carry the vapors into other work areas. Ventilation should carry the vapors to the outside of the building and away from areas in which personnel are working.

5.1.3.4 If sufficient ventilation is not available, Comfo Respirator MSA Ll60968 with Chemical Cartrdige #678D or fresh air mask must be worn.

5.1.3.5 Work shall not be conducted in an explosive concentration of solvent vapors.

Step Number	Description
5.1.3.6	Cleaning solvents having a flashpoint of less than 200 F shall be classified as flammable liquids and shall be handled and stored in accordance with Management Manual Safety Procedure 16, Handling Flammable Liquids.

5.2 APPROVED SOLVENTS

5.2.1 Stoddard Type Solvents

DESCRIPTION:

Clear, colorless liquids of the kerosenenaptha class.

5.2.1.1 Flash Point and Fire Hazard:

The vapors of these solvents, in the proper concentration and ignited by an open flame or spark, will burst into flames at 100 to 110 F. The vapors of these solvents are considered a moderate fire hazard.

5.2.1.1.1 Recommended maximum allowable concentration:

500 parts per million of air.

Step Number	Description
5.2.1.2	Toxicity: Stoddard solvents are a slight irritant to the skin and to the air passages if a heavy concentration of vapors is breathed. Solvents will emit acrid fumes and may explode if heated to decomposition. Moderate ventilation shall be used to clear vapor.
5.2.1.3	Uses: Stoddard solvents may be used as an oil and grease remover in the cleaning of equipment and machinery. They are considered noncorrosive to metal surfaces. Being a petroleum distillate, Stoddard type solvents will leave a thin grease film on the cleaned surface which may be objectionable for certain types of work.
5.2.2	Trichlorethane 1,1,1 (inhibited)
5.2.2.1	Other names: Chlorothene, Vythene, Inhibisol, Methyl Chloroform.

Step Number	Description
5.2.2.2	Description: A colorless liquid of the chlorinatedhydrocarbon class, chemical formula CH3CCL3.
5.2.2.3	Flash Point and Fire Hazard: The vapors of this solvent will not flash; it is not a fire or explosion hazard.

NOTE
Trichloroethane or Methylene Chloride shall not be used in any type of pressurized systems due to reaction between the materials and any galvanized or aluminum parts.

5.2.2.4	Recommended maximum allowable concentration: 500 parts per million in air.
5.2.2.5	Toxicity: This solvent is of slight irritation to the skin and is moderately toxic if the vapors are inhaled or the liquid ingested. When heated to decomposition, this solvent will emit highly toxic fumes of chlorides. Maintain a rate of ventilation sufficient to effectively and continuously remove the vapors when working with this solvent.

Step Number	Description
5.2.2.6	Uses: This solvent may be used for cleaning small, delicate items, such as cleaning wire rope prior to socketing and cleaning electrical and electronic equipment and related items. It should be noted that solvents and their vapors may cause distinct changes to insulation, wiring, and other susceptible parts of critical electronic equipment, and therefore must be used with care.
5.2.3	DuPont Cleaning Solvent #49
5.2.3.1	Description: A clear, colorless liquid compound of a mixture of petroleum distillate and chlorinated hydrocarbons.
5.2.3.2	Composition: 70% Stoddard Solvent, 25% Methylene Chloride, 5% Perchloroethylene.

Step Number **Description**

NOTE
Trichloroethane or Methylene Chloride shall not be used in any type of pressurized systems due to reaction between the materials and any galvanized or aluminum parts.

5.2.3.3 Flash Point and Fire Hazard:

This solvent will not flash unless it is boiled, at which time and after 20% evaporation, a flash point of 132 F is reached. As a fire hazard, this solvent is in the same class as kerosene, a moderate fire hazard.

5.2.3.4 Recommended maximum allowable concentration:

200 parts per million in air.

5.2.3.5 Toxicity:

This solvent is of moderate irritation to the skin and a moderate toxicant when inhaled or ingested. When heated to decomposition, it may emit toxic fumes of phosgene gas and chlorides. Use a high rate of ventilation when working with this solvent. Contact of the skin with this mixture should be avoided because absorption through the pores may produce the same physiological effects as inhalation.

Step Number	Description
5.2.3.6	This material is dangerous to the eyes; they shall be well protected.
5.2.3.7	Uses: This solvent may be used in electric motor cleaning. Most of the common insulating varnishes are inert to the action of this mixture. When using the mixture for the first time, use a small amount until certain whether there is a limit of exposure which must be observed to avoid any tendency of the varnish to soften or lift.
5.2.4	Acetone
5.2.4.1	Description: Colorless liquid, fragrant mint-like odor, chemical formula CH3COCH3.
5.2.4.2	Flash Point and Fire Hazard: The vapors of this solvent will flash at a temperature above 0 F and can be a dangerous fire hazard if exposed to heat or flame.

Step Number	Description
5.2.4.3	Recommended maximum allowable concentration: 1000 parts per million in air.
5.2.4.4	Toxicity: Because of the limited quantity of this solvent used by Maintenance, concentration of vapor will normally present no problem. In large concentrations, acetone fumes will cause irritation of the eyes and mucous membranes of the respiratory tract. Prolonged exposure of the skin to the liquid or vapors may cause irritation.
5.2.4.5	Uses: Acetone is used where a greaseless and fast drying action is desirable, as in cleaning certain instruments. Acetone is also used by various shops to seal and cement acetate together.
5.2.5	Alcohol (Ethyl Alcohol)
5.2.5.1	Description: Clear, colorless, fragrant liquid, chemical formula: CH3CH2OH.

Step Number	Description
5.2.5.2	Flash Point and Fire Hazard: The vapors of this solvent, in proper concentration, will flash at temperatures above 61 F. When exposed to excessive heat or open flame, this solvent can be a dangerous fire hazard.
5.2.5.3	Recommended maximum allowable concentrations: 1000 parts per million in air.
5.2.5.4	Toxicity: Because of the limited quantity of alcohol used by the Maintenance Department, concentration of vapors should present no problem. However, in heavy concentrations, alcohol vapors will cause irritation of the eyes and the mucous membranes of the respiratory tract. A moderate rate of ventilation should keep vapor concentration at a safe level.
5.2.5.5	Ethyl alcohol used on the plant has been "denatured" by chemical additives, making this liquid poisonous if taken internally.

Step Number	Description
5.2.5.6	Uses: Ethyl alcohol is used in small quantities to clean certain type instruments.
5.2.6	Inhibisol
5.2.6.1	Description: Colorless liquid of chlorinated solvents. Chemical formula: CCL4.
5.2.6.2	Flash Point and Fire Hazard: None - this material cannot burn.
5.2.6.3	Threshold limit value is 350 PPM. Effects of overexposure: Anesthetic effects, dizziness, headache. Emergency first aid: Remove to fresh air and obtain medical help. Eye contact: Flush with water and consult a physician. Swallowing: Induce vomiting and obtain medical attention.

Step Number	Description
5.2.6.4	Toxicity: Inhibisol is extremely toxic and can be taken into the body by inhalation to the lungs, ingestion through the mouth, or prolonged and repeated contact with the skin. Prolonged exposure to heavy concentrations causes gastrointestinal disorders.
5.2.6.5	Spill or Leak Procedures: Ventilate the area. Deposit waste in tank at Burning Ground.
5.2.6.6	Avoid contact with skin, eyes, and clothing. Do not store near direct heat. Vent off possible internal pressure.
5.2.6.7	A high rate of ventilation shall always be maintained when using Inhibisol.

WARNING

Avoid breathing vapors. Always use the smallest amount of solvent that will effectively perform the cleaning job.

Step Number	Description
5.2.6.8	Uses: This solvent, in minute quantities, may be used to clean equipment and parts where the thin grease film and dry residue left by other solvents would be objectionable. The Instrument Shop and Ballistics Instrument Shop use small quantities for this reason.
5.2.6.9	Large quantities of Inhibisol shall not be used by personnel anywhere in the Maintenance Department without the approval of supervision. Inhibisol shall be used under carefully controlled conditions.
5.2.7	Nitroglycerin Remover
5.2.7.1	Description: A mixture of sodium sulfide, alcohol, acetone, and water.
5.2.7.2	Flash Point and Fire Hazard: Nitroglycerin remover will have a flash point and fire hazard similar to acetone and alcohol.

Step Number	Description
5.2.7.3	Recommended maximum allowable concentration: 1000 parts per million in air.
5.2.7.4	Toxicity: The toxic properties of nitroglycerin remover will be similar to those of acetone and alcohol.
5.2.7.5	Uses: Nitroglycerin remover is used as a special solvent in the cleaning of equipment contaminated with nitroglycerin or products containing nitroglycerin.
5.2.8	"Gunk"
5.2.8.1	Description: "Gunk" is a trade name for a degreasing-cleaning solvent manufactured by Radiator Specialties Corporation, Gunk Division, Charlotte, North Carolina.

Step Number	Description
5.2.8.2	Flash Point: 178 F.
5.2.8.3	Recommended maximum allowable concentration (cresole): 5 parts per million in air.
5.2.8.4	Gunk contains approximately 16% cresole, which can cause skin burns. Rubber protective gloves, head covering, and goggles shall be worn to prevent contact with the skin or eyes. A fresh air mask shall be worn when inside the paint stripping tank. If Gunk comes into contact with the eyes, wash with flowing water and report to the Plant Hospital for treatment immediately.
5.2.8.5	Uses: Gunk is used in a vat or tank in Building 1041 to clean and paint strip scales for overhaul. See Scale Maintenance, MSOP 4-27-13, paragraph 5.21 through 6.5.1 for correct operation of this tank.

Step Number	Description
5.2.9	Butyl Alcohol
5.2.9.1	Description: A colorless liquid. Chemical formula: C4H9OH.
5.2.9.2	Recommended allowable concentration: 100 parts per million in air.
5.2.9.3	Flash point: 84 F.
5.2.9.4	Small quantities are used by the Electronic Shop for strain gage maintenance.
5.2.9.5	Precautions: Avoid inhalation and skin contact.
5.2.10	Intex #8793 - Paint Stripper

Step Number	Description
5.2.10.1	Description: Brown, 2-layer liquid.
5.2.10.2	Threshold Limit: 500 ppm.
5.2.10.3	This product is used in the Degreasing Shop for removal of paint.
5.2.10.4	Comfo respirator or fresh air mask must be worn when placing work in Intex tank, dashing work up and down, spraying work with steam or water, or changing or adding Intex to tank.

WARNING

Exhaust ventilation shall be used; eye protection and long rubber gloves shall be worn. In case of eye or skin contact, flush with water and soap. Report to Plant Hospital immediately.

Step Number	Description
5.2.11	Intex #827 - Safety Solvent
5.2.11.1	Description: Colorless with odor of chlorinated solvent.
5.2.11.2	Threshold Limit: 500 ppm.
5.2.11.3	This product will be used in the Degreasing Shop for paint removal and cleaning purposes.
5.2.11.4	If Intex 827 is used in open container and cleaned by hand, respirator or fresh air mask must be worn.

WARNING

In case of eye or skin contact, flush with water and report to Plant Hospital immediately. Exhaust ventilation shall be used and eye protection and long rubber gloves shall be worn.

Step Number	Description
5.2.12	Lectra Clean - Cleaner/Degreaser for Electrical Equipment
5.2.12.1	Description: Colorless with irritating odor at high concentrations.
5.2.12.2	Threshold Limits: 350 ppm
5.2.12.3	This product will be used in the Electric Shop for cleaning and degreasing electrical equipment.
5.2.12.4	Product should be used in the presence ventilation if used in concentrations above threshold limit. If ventilation is not available, self contained breathing apparatus should be used for concentrations above threshold limit. Solvent resistant gloves are safety goggles shall be worn during use.

Step Number	Description
5.2.13	Voltz
5.2.13.1	Description: Transparent liquid with a citrus odor.
5.2.13.2	Threshold limit: 300 ppm
5.2.13.3	This product is used in the Electric Shop motor cleaning vat.
5.2.13.4	Normal ventilation is adequate for use of this product unless used in confined or enclosed spaces where supplied-air respiratory protection should be used. Protective chemical resistant gloves, splash goggles, and chemical resistant apron should be used to avoid prolonged skin contact, protect the eyes, and avoid contaminating regular clothing.

2005

Display of Facility for Property Section

PR	Bldg Num	PL	T	Sta	NAME	Location	Ty	Dep	Mass	UM	Volumn	Acq	Ac Yr	Catgy	AC	RPI
D	1013 00		B	08	MOTOR HOUSE	COTTON A	S	511	48	SF	360	0	1942	0022680	05	0101
	1014 00		B	08	EMERGENCY CATCH HOUSE	COTTON A	S	511	161	SF	1449	3074	1942	0022680	05	0101
	1017 00		M	08	FLUME LINES 1012 TO 1019	COTTON A	P	511	756	LF	0	45832	1942	0022680	05	0101
	1019 00		B	06	Property Only	COTTON A	S	511	4139	SF	4139	0	1942	0045210	05	0101
	1020 00		M	06	BOILING TUB SETTLING PIT	COTTON A	P	511	90000	G	0	44091	1942	0022680	05	0102
A	1020 00		B	07	PUMP HOUSE	COTTON A	P	511	182	SF	1517	0	1942	0022680	05	0102
	1022 00		B	06	Property only	COTTON A	S	511	677	SY	677	0	1942	0045210	05	0102
	1024 00		B	06	Property Only	COTTON A	S	511	3201	SY	3201	0	1942	0045210	05	0102
	1025 00		B	07	POACHER & BLENDING SETTLI	COTTON A	P	511	5880	SF	41160	100984	1942	0022680	05	0102
A	1025 00		B	07	PUMP HOUSE	COTTON A	P	511	812	SF	13576	0	1942	0022680	05	0102
	1026 00		B	M	FINAL WRINGER HOUSE	A GREEN LI	S	511	5049	SF	96555	115261	1942	0022680	05	0102
	1030 00		B	06	NITROCELLULOSE AREA OFFIC	COTTON A-B	S	511	1562	SF	12992	12243	1942	0061050	05	0103
	1031 00		B	06	CHANGE HOUSE	COTTON A-B	P	511	2140	SF	21400	31623	1942	0014178	05	0103
	1034 00		B	01	INST, SCALE, REFRIG, AND	COTTON A	P	000	10178	SF	64469	422983	1952	0021910	05	0103
	1035 00		B	08	LUNCH ROOM	COTTON A	S	511	192	SF	1536	1949	1951	0074060	05	0103
	1038 00		B	03	LUNCH ROOM AND STORAGE	COTTON A-B	S	511	1500	SF	12000	15624	1942	0074060	05	0103
	1039 00		B	01	CHANGE HOUSE	COTTON A-B	P	671	1812	SF	18000	26156	1942	0014178	05	0103

2005

Display of Facility for Property Section

PR	Bldg Num	PL	T	Sta	NAME	Location	Ty	Dep	Meas	UM	Volumn	Acq	Ac Yr	Catgy	AC	RPI
	1041 00		B	01	DEGREASER HOUSE	COTTON A	P	576	987	SF	9870	8641	1942	0021910	05	0104
	1042 00		B	01	INSTRUMENT AUXILIARY SHOP	COTTON A	P	575	487	SF	5113	7492	1942	0044220	05	0104
	1044 00		B	01	PURIF. AREA MAINT. OFFICE	COTTON A-B	S	541	1500	SF	15000	9626	1942	0021910	05	0104
	1050 00		M	08	LPG STORAGE TANK FARM	INERT GAS	P	511	5715	BL	0	352482	1979	0041150	05	0105
	1500 00		B	M	DEHY PRESS HOUSE/STORAGE/	A GREEN LI	P	000	5780	SF	84295	213705	1942	0022680	05	0150
A	1500 00		B	07	LOADING STATION	A GREEN LI	P	511	530	SF	4345	0	1942	0022680	05	0150
	1501 00		B	07	ALCOHOL PUMP & ACCUMULATO	A GREEN LI	S	511	281	SF	3120	31424	1942	0022680	05	0150
A	1501 00		B	07	WEAK ALCOHOL STORAGE HOUS	A GREEN LI	S	511	616	SF	10780	0	1942	0022680	05	0150
	1502 00		B	01	ETHER STILL HOUSE NO 1	SOLVENTS	P	745	4574	SF	62535	143010	1942	0022680	05	0150
A	1502 00		B	01	PUMP HOUSE NO 4	SOLVENTS	P	745	245	SF	2307	0	1942	0022680	05	0150
	1503 00		B	01	ALCOHOL RECTIFICATION HOU	SOLVENTS	P	745	4890	SF	61126	36779	1942	0022680	05	0150
A	1503 00		B	01	PUMP HOUSE	SOLVENTS	P	745	25	SF	169	0	1942	0022680	05	0150
	1504 00		B	06	CHANGE HOUSE	A GREEN LI	P	511	2140	SF	21400	31959	1942	0014178	05	0150
	1505 00		B	06	CHANGE HOUSE	A GREEN LI	P	511	2140	SF	21400	32309	1942	0014178	05	0150
	1506 00		B	06	DIPHENYLAMINE MIX HOUSE	A GREEN LI	S	511	597	SF	7623	32300	1942	0022680	05	0150
A	1506 00		B	07	PUMP HOUSE	A GREEN LI	S	511	120	SF	960	0	1942	0022680	05	0150
B	1506 00		B	07	MOTOR HOUSE	A GREEN LI	S	511	47	SF	474	0	1942	0022680	05	0150

RA-85A REV. 6/61

RADFORD ARSENAL
HERCULES POWDER COMPANY INCORPORATED

PROPERTY RECORD

G.L.	1715
CAT.	21910
TYPE	P

DAAA09-77-C-4007

CONTRACT W-11-173-ORD-31

CARD NO. 1

BUILDING NAME Record Sample Store / House NO. 1041 REFERENCE TO TRANSFER OF PROPERTY GR-895 290 S/N 5

Building Name changed to Degreaser House

BUILDING DESCRIPTION COST $8,641

BUILDING SIZE

	LENGTH	WIDTH	CLEAR HEIGHT	SQUARE FEET	CUBIC FEET
B					
1	39'-6"	25'-0"	10'-0"	987	9870
2					
3					
			TOTAL	987	9870

FOUNDATION
1'-0" conc. fdn. wall on conc. footing

STRUCTURE-FLOOR CONST.
concrete & conc. block; 5" conc. slab on cinder fill

WALL COVERING
12" conc. block
¼ masonite ceiling

ROOF CONST.
Rigid asbestos shingles on 1" sheathing

HEATING
Unheated

UTILITIES
Lighting

FIRE PROTECTION
Hydrant

HOT WATER FACILITIES
No

ACCESSIBILITY TO BUILDING
Road

REMARKS

BARRICADES: NO. None TYPE SQUARE FEET (FACE)

IN - OUT	DESCRIPTION AND RECORD OF CHANGES		CEV NO.	AMOUNT DEBIT	AMOUNT CREDIT	REVISED COST
IN	3-#6 440 V, 3 phase power service w/15 amp circuit breaker Rev Dwg 6929-1546	WO 3-19-62 Memo	XI-627 5093			
OUT IN	3'x7' Stl door & frame, installed 2-4'x9'6" wood door. 13'0"Lx9'1"Wx2'11" deep pit in floor for degreaser, Conc floor w/8" conc block wall, Dwg 6929-391	3-62 WO	Memo 5233			
IN	1½" 40# steam service w/pressure reductin station, steam to 2-C.I. radiators & 40# service to degreaser. 3/4" air service w/piping for 3 service drops & 2-pressure reducing stations	3-62 WO Memo	AS 574 5233			
IN	Monorail & supports & stl grating around degreaser.	4-16-62 Memo	WO XI-645 5234			

RA-85-REV. 6/61

RADFORD ARSENAL
HERCULES POWDER COMPANY
INCORPORATED

DAAA09-77-C-4007
CONTRACT NO. W-11-173-ORD-37

DAAA09-71-C-2517

PROPERTY RECORD

BUILDING NAME Record Sample Store House BUILDING NO. 1041 CARD NO. 2
Bldg. Name changed to Degreaser House

IN - OUT	DESCRIPTION AND RECORD OF CHANGES	CEV NO.	AMOUNT DEBIT	AMOUNT CREDIT	REVISED COST
IN	Electrical motor starting equipment. Air and water piping for installation of Sand Blaster. Dwg. 6929-391 & 1546	W. O. XS-4374, 4/12/65 Memo 6800, 5/7/65			
IN	Cleaning tank, with circulating pump andelectrical starting equipment.	W. O. # 69126	1/18/67		

Property in Building 1041-00 , Dept All
DEGREASER HOUSE (COTTON A)

Prop #	Description	Dept	FSN	Account	EM	YA	YI	SC	Cost	Repl Val
104509	SCALE MONORAIL TOLEDO 451	576	66700800000S0	017047		1941	2005	05	748	13,585
104515	SCALE MONORAIL TOLEDO 452	576	66700800000S0	017047		1941	2005	05	748	13,585
104746	TEST TBL SS 40X40 HERCULES	576	71950031000S0	017047		1959	2001	05	1,057	8,744
110047	DRILL PRESS DELTA 14	576	34130000000S0	017047		1952	2001	05	137	1,478
112225	HOIST AIR MOD A IR 40268	576	39503020000S0	017047		1962	2001	05	235	1,805
120254	WATER COOLER OASIS 005085	576	41100303000S0	017047		1978	2001	05	408	1,269
123967	GRINDER W/DUST COLL 246865	576	34150000000N0	017047		1983	2001	05	1,709	3,760
125275	TANK,550 GAL,MTL,48X72" VERT.	576	54300000000S0	017047		1986	2001	05	610	1,322
125396	SCALE PLATFORM AH EMERY 24X24IN 300LB CAP	576	66702178030N0	017047		1986	2007	05	9,633	20,881
125802	SCALE,CHLORINE,PENNWALT548	576	66700400000S0	017047		1987	2007	05	500	1,057
226004	SCALE PLATFORM 800LB TOLDO	576	66700400000S0	016503		1951	2001	05	610	7,531
233351	SCALE PLATFORM 800LB TOLDO	576	66700400000S0	016503		1951	2001	05	595	7,346
234022	SCALE, GRAVITYGRAM 839296	576	66700601000S0	016503		1941	2001	05	131	2,379
234029	SCALE, GRAVITYGRAM 839303	576	66700601000S0	016503		1941	2001	05	119	2,161
234123	SCALE, PP, HOWE 1423221	576	66700400000S0	016503		1941	2007	05	25	454
234319	SCALE, PLAT, F-M 1000 LB	576	66700400000S0	016503		1941	2006	05	75	1,362
234324	SCALE, PLAT, F-M 200 LB	576	66700400000S0	016503		1941	2001	05	50	908
234373	SCALE, ZONING 800LB TOLEDO	576	66700000000S0	016503		1952	2001	05	383	4,133
234482	SCALE, BENCH	576	66700300000S0	016503		1941	2001	05	87	1,580
235823	SCALE PLATFORM TOLEDO	576	66700400000S0	016503		1952	2002	05	545	5,881
236660	SCALE, PP, HOWE 1549897	576	66700400000S0	016503		1952	2001	05	54	583
236663	SCALE, PP, HOWE 1549894	576	66700400000S0	016503		1952	2001	05	54	583
239001	SCALE PLAT DIAL TOLEDO	576	66700400000S0	016503		1953	2006	05	547	5,903
241446	SCALE BENCH 200LB TOLEDO	576	66700300000S0	016503		1954	2001	05	540	5,827
255159	SCALE BENCH 150LB TOLEDO	576	66700300000S0	016503		1963	2002	05	721	5,538
257560	SCALE PLAT HOWE 65-11585	576	66700400000S0	016503		1965	2006	05	129	955
257573	SCALE PLAT HOWE 65-11598	576	66700400000S0	016503		1965	2003	05	129	955
257580	SCALE PLAT HOWE 65-11605	576	66700400000S0	016503		1965	2001	05	129	955
257610	SCALE PLAT HOWE 65-11487	576	66700400000S0	016503		1965	2002	05	592	4,382
259441	SCALE, PLAT COLT G617518	576	66700400000S0	016503		1966	2001	05	154	1,041
259442	SCALE, PLAT COLT G617522	576	66700400000S0	016503		1966	2001	05	154	1,041
259489	SCALE DIAL TOLEDO 595870	576	66700000000S0	016503		1966	2003	05	735	4,969
269493	SCALE BENCH HOWE 70-04235	576	66702172022S0	017047		1970	2001	05	1,224	7,080
269510	SCALE BENCH HOWE 70-04238	576	66702172022S0	017047		1970	2001	05	1,224	7,080

Property in Building 1041-00 , Dept All
DEGREASER HOUSE (COTTON A)

Prop #	Description	Dept	FSN	Account	EM	YA	YI	SC	Cost	Repl Val
269513	SCALE BENCH HOWE 70-04239	576	6670217202 2S0	017047		1970	2001	05	1,224	7,080
269514	SCALE BENCH HOWE 70-04240	576	6670217202 2S0	017047		1970	2001	05	1,224	7,080
270210	SCALE BENCH TOLEDO 539589	576	6670212202 0S0	017047		1971	2006	05	1,225	7,086
270211	SCALE BENCH TOLEDO 539588	576	6670212202 0S0	017047		1971	2001	05	1,225	7,086
270212	SCALE BENCH TOLEDO 539587	576	6670212202 0S0	017047		1971	2006	05	1,225	7,086
270625	SCALE BEAM PORTABLE 2496	576	6670030000 0S0	016503		1972	2001	05	180	980
277975	SCALE,TOL.DIAL BENCH 9373	576	6670021700 0N0	017047		1980	2001	05	2,672	7,192
283609	SCALE,BENCH DETECTO 847129	576	6670217208 2N0	017047		1984	2001	05	2,105	4,608
283610	SCALE,BENCH DETECTO 847130	576	6670217208 2N0	017047		1984	2001	05	2,105	4,608
284851	SCALE,DIAL TOLEDO 36475	576	6670000000 0N0	017047		1984	2001	05	2,242	4,908
284856	SCALE,DIAL TOLEDO 36473	576	6670000000 0N0	017047		1984	2006	05	2,242	4,908
284862	SCALE,DIAL TOLEDO 36462	576	6670000000 0N0	017047		1984	2001	05	2,242	4,908
284863	SCALE,DIAL TOLEDO 36456	576	6670000000 0N0	017047		1984	2004	05	2,242	4,908
284907	SCALE,DIAL TOLEDO 36445	576	6670000000 0N0	017047		1984	2006	05	2,242	4,908
284911	SCALE,DIAL TOLEDO 36441	576	6670000000 0N0	017047		1984	2004	05	2,242	4,908
284919	SCALE,DIAL TOLEDO 36419	576	6670000000 0N0	017047		1984	2001	05	2,242	4,908
284928	SCALE,DIAL TOLEDO 36428	576	6670000000 0N0	017047		1984	2001	05	2,242	4,908
284932	SCALE,DIAL TOLEDO 36449	576	6670000000 0N0	017047		1984	2005	05	2,242	4,908
284933	SCALE,DIAL TOLEDO 36433	576	6670000000 0N0	017047		1984	2001	05	2,242	4,908
284937	SCALE,DIAL TOLEDO 36437	576	6670000000 0N0	017047		1984	2001	05	2,242	4,908
292719	TABLE,STEEL,45X42X26	576	7110000000 0S0	016503		1987	2001	05	350	740
293832	SCALE,WALLACE-T,AM28598	576	6670040000 0S0	016503		1987	2001	05	810	1,713
293833	SCALE,WALLACE-T,AM28598	576	6670040000 0S0	016503		1987	2001	05	810	1,713
307033	ELECTRONIC SCALE CAPITOL DUAL CYLINDER,	576	6670000000 0S0	017047		1998	2003	05	1,250	1,411
307056	CABINET, SAND BLAST ECONOLINE MODEL 4X	576	5350000000 0N0	017047		1999	2001	05	1,800	1,973

Items of Property in Bldg:	59	*Cost / Repl Value of Property in Bldg:*	67,658 262,468
Items of Property in Selected Bldgs:	59	*Cost / Repl Value of Property in Selected Bldgs:*	67,658 262,468

RA-85A REV. 6/61

RADFORD ARSENAL
HERCULES POWDER COMPANY INCORPORATED

PROPERTY RECORD

G.L.	1715
CAT.	21910
TYPE	P

DAAA09-77-C-4007
CONTRACT W-11-173-ORD-31

CARD NO. 1

BUILDING NAME Production Engineering Office No. 1034 REFERENCE TO TRANSFER OF PROPERTY GR-1791 290 S/N 187

Bldg Name changed to Scale and Instrument Shop

BUILDING DESCRIPTION

COST 131,381

BUILDING SIZE

	LENGTH	WIDTH	CLEAR HEIGHT	SQUARE FEET	CUBIC FEET
B					
1	96'-9 3/4"	48'-0 3/4"	10'-8"	4656	49665
Wing 2	46'-8½"	29'-9"	10'-8"	1388	14804
3					
*	43'	48'3/4"	10'10"	2067	22,045
**	43'	48'3/4"	10'10"	2067	22,392
			TOTAL	10178	108,906

FOUNDATION
8" conc. fdn. wall on conc. footing

STRUCTURE-FLOOR CONST.
Conc. masonry block
Asphalt tile on 5" conc. slab.

WALL COVERING
8" conc. block. Masonite int. wall lining. WING SECTION

ROOF CONST.
20 yr. bonded roofing on 1" sheathing. Truss type 2" x 12" rafters

HEATING
Steam, cast iron radiation

UTILITIES
Steam, air, water, power & lighting

FIRE PROTECTION
Sprinkler system

HOT WATER FACILITIES
Yes

ACCESSIBILITY TO BUILDING
Road

REMARKS Former Nitro Cotton laboratory.

* Main Floor Addition
** Ground Floor Addition

BARRICADES: No. None TYPE _____ SQUARE FEET (FACE) 52

IN - OUT	DESCRIPTION AND RECORD OF CHANGES		CEV NO.	AMOUNT DEBIT	AMOUNT CREDIT	REVISED COST
IN	Roof ventilator, Penn Power Co, size 19, S/N E3656, RFA 12409 w/¼ HP Westinghouse motor, M4195	Memo Proj	5294 MC-1396			
OUT	Partitions between rooms #1 & 2 and 2 & 3 Replaced double window in Rm. #1 and #9 with 2-4' x 10' x 1-3/4" doors Dwg. 37-6161 By ~~Bldg. Inspection~~	W.O. Memo Date	GEN669, XI-609 5396 2/14/62			
OUT	Westinghouse Water Cooler, RFA 4138 moved to Bldg. 222 10-29-62 PT-4633		CEV 3778 MEMO 5440			
	Enlarged Rm. #6 reduced size women's rest room, removed one water cooler, added 3 fluorescent lighting fixtures. W.O. 1034, 10/22/62, Memo 5506, 11/19/62					

RA-85-REV. 6/61

DAAA09-71-C-4007

RADFORD ARSENAL
HERCULES POWDER COMPANY
INCORPORATED

CONTRACT NO. W-11-173-ORD-37

PROPERTY RECORD

Bldg. Name changed to
BUILDING NAME Scale and Instrument Shop Office BUILDING NO. 1034 CARD NO. 2

IN - OUT	DESCRIPTION AND RECORD OF CHANGES	CEV NO.	AMOUNT DEBIT	AMOUNT CREDIT	REVISED COST
IN	Fibertone acoustical ceiling tile, Class C size 24" x 24" x 3/4" thick, Rooms #4&6 — Memo 5663, W.O. XS-1126, Date 10/25/62				
	Rearrangement of electrical lighting fixtures, receptacles for scale and instrument shop. Dwg. 6929-1200 — W.O. XS-1070, XS-2024, XS-2036, 3/29/64; Memo 6635, 12/22/64				
	Remove (1) receptacle FSQX-23 from circuit 17 and relocate on circuit 18 Rm. 15, Dwg. 6929-1200 — W.O. XS-4388, 6/11/65; Memo 6859, 7/15/65				
IN	220 Volt twist lock receptacle with switch and 30 amp safety switch, Dwg. 6929-1200 — W. O. 59326, 9/7/65; Memo 6881, 10/7/65				
In	American Blower Utility set w/ 1/3 HP 440 volt motor, with motor starting equipment and 4' X 2'-6" exhaust hood, RM #14. Dwg 6929-1200 — W.O.# 59355; Memo No. 7104, 5/6/66				
IN	3 Lockers @ $10.00 Ea. — CEV-5508, 9/8/66				
IN	One Fluorescent lighting fixture added to circuit # 12 room # 7, DWG 6929-1200 W.O.# 69116 7.22.66 Removed wall partition between rooms 12 & 13 relocated shop equipment to room # 16 W.O. # 59335 8.31.65				
Room 16	Relocated one fluorescent light fixture and added one — W. O. # 69134 12/20/66				
	Removed partition wall between rooms # 4 and 5. — W. O. # 780547 4/14/67				

RA-85-REV. 6/61

RADFORD ARSENAL
HERCULES POWDER COMPANY
INCORPORATED

CONTRACT NO. W-11-173-ORD-37

PROPERTY RECORD

BUILDING NAME Scale and Instrument Shop Office BUILDING NO. 1034 CARD NO. 3

IN - OUT	DESCRIPTION AND RECORD OF CHANGES	CEV NO.	AMOUNT DEBIT	AMOUNT CREDIT	REVISED COST
IN	A 2-story addition to existing Bldg. 1034, concrete footer and slabs on grade CMU walls, water proofed, wood truss roof with built up roof. Approx. dimensions are: main floor - 48' x43'x 10'8". Ground floor-48 x 43 x 10'10". Bldg. includes a monorail system on the upper level storage area, exhaust fans, lights, steam unit heaters on the lower level with steam heat (ductwork) on the upper level. Also included is bituminous paving at the north end of the addition. DD 1354-83-02, CEV 0071-48, FEb. 1983, Memo No. 8803	0071-48 2-83			

Appendix B

Soil Boring Logs

ARCADIS

Sample/Core Log

Boring/Well **1034-1** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/8/2008 Drilling Completed 5/8/2008

Total Depth Drilled 36 Feet Hole Diameter 1.75 inches Collection times of samples 14:30 / 14:50

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 7-8 feet feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	48	9547	0 - 0.5' asphalt, odor
			41, 0, 0	0.5 - 4' orange brown CLAY, very stiff, dry (CL)
4	8'	48	0,0,0,0	0 - 4' orange brown CLAY, very stiff, dry (CL)
				Attempted hydropunch; screen set from 32 - 36 ft bgs*
				No water after 1 hour. No sample was collected.
				*Hard material encountered to 32 ft bgs. Rods pushed without hammer from 32 -
				36 ft. Rods wet when removed.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1034-2** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started N/A Drilling Completed N/A

Total Depth Drilled 4 Feet Hole Diameter -- inches Collection times of samples N/A

Length and Diameter of Coring Device N/A **Soil Sample Intervals** N/A feet feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor -- Driller -- Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
				Boring advanced for soil gas collection. No soil or water samples collected.
				Soil gas sample collected 5/8/08 14:20.

ARCADIS

Sample/Core Log

Boring/Well **1034-4** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA | Drilling Started: 5/8/2008 | Drilling Completed: 5/8/2008

Total Depth Drilled: 8 Feet | Hole Diameter: 1.75 inches | Collection times of samples: 8:30 / 8:45

Length and Diameter of Coring Device: 4 feet / 1.75 inches | **Soil Sample Intervals**: 0.5-1.5 5-6 feet

Land-Surface Elev.: N/A feet | ☐ Surveyed | ☐ Estimated | Other: N/A

Drilling Fluid Used: N/A | Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies | Driller: Robert Stewart | Helper: --

Prepared By: Sandra Grabowski | Hammer Weight: -- | Hammer Drop: -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	30	0,0,0,0	0 - 0.5' asphalt.
				0.5 - 2.5' orange brown CLAY, stiff, dry to slightly moist (CL)
4	8'	48	0,0,0,0	0 - 4' orange brown CLAY, stiff, dry to slightly moist (CL)
				*2 inches of asphalt ~ 4.5 ft bgs
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1034-6** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/9/2008 Drilling Completed 5/9/2008

Total Depth Drilled 22 Feet Hole Diameter 1.75 inches Collection times of samples 12:50 / 13:00

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 7-8 feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	48	0,0,0,0	0 - 0.5' asphalt.
				0.5 - 4' orange brown CLAY, very stiff, dry (CL)
4	8'	48	0,0,0,0	0 - 1' orange brown CLAY, very stiff, dry (CL)
				1 - 4' orange brown CLAY with some sand and gravel, very stiff, dry (CL)
				Attempted hydropunch; refusal at 22 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1034-7** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/9/2008 Drilling Completed 5/9/2008

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Collection times of samples 13:30 / 13:40

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 7-8 feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other Duplicated soil sample collected

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	36	0,0,0,0	0 - 0.5' asphalt.
				0.5 - 3' orange brown CLAY, stiff, dry (CL)
4	8'	36	0,0,0,0	0 - 1' orange brown CLAY, stiff, dry (CL)
				1 - 3' orange brown CLAY with some sand, stiff, dry (CL)
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1034-8** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/8/2008 Drilling Completed 5/8/2008

Total Depth Drilled 22 Feet Hole Diameter 1.75 inches Collection times of samples 15:20 / 15:30

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 4-5 feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other: N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	36	0	0 - 0.5' asphalt.
			503,161,31	0.5 - 3' orange brown CLAY with some gravel, stiff, slightly moist (CL)
4	8'	36	1287, 3011	0 - 1' brown CLAY with gravel, medium soft, slightly moist (CL)
			0	1 - 3' orange brown CLAY with gravel, medium soft, moist (CL)
				Attempted hydropunch; refusal at 22 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-1A | Project/No. RAAP/ GP08RAAP.0047.DF000 | Page 1 of 1

Site Location: Radford, VA | Drilling Started: 6/26/2008 15:55 | Drilling Completed: 6/26/2008 16:10

Total Depth Drilled: 28 Feet | Hole Diameter: 1.75 inches | Type of Sample/ Coring Device:

Length and Diameter of Coring Device: 5 feet / 1.75 inches | Sampling Interval: NA feet

Land-Surface Elev.: NA feet ☐ Surveyed ☐ Estimated | Other: NA

Drilling Fluid Used: NA | Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies | Driller: Josh K | Helper: NA

Prepared By: Michael Cobb | Hammer Weight: NA | Hammer Drop: NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	3.9	0.0	0 - 0.6 asphalt and roadbed.
			0.0	0.6 - 0.9 medium to coarse SAND and GRAVEL (fill).
			0.0	0.9 - 1.8 medium brown fine SAND, medium dense, moist.
			0.0	1.8 - 2.7 medium brown fine to coarse SAND and fine GRAVEL, little silt (fill).
			0.0	3.7 - 3.9 yellow brown CLAY/SILT, weathered rock, very stiff, angular fragements
				with relict rock texture (i.e. bedding), however it crumbles to powder, moist to wet.
5	10	5	0.0	0 - 3.7 weathered rock as CLAY and SILT with relict fabric, bedding (~ 5 degree dip),
				very stiff with soft wet intervals 3 - 3.7'.
			0.0	3.7 - 4.8 deep rust red brown, hard decomposed rock with strong bedding.
10	15	4.8	0.0	0 - 3.9 weathered rock, CLAY and SILT, with relict fabric, bedding, very stiff, wet,
				soil has appearance of gravel/rock but crumbles to clay.
			0.0	3.9 - 4.8 SAA but soft, less decomposed rock.
15	20	5	0.0	0 - 4 yellowish brown, weathered rock, SILT and CLAY, some intact rock
				fragments as coarse SAND/GRAVEL, relict rock structure, wet, very stiff.
			0	4 - 5 dark reddish brown, very stiff, decomposed rock breaks apart as coarse
				SAND / fine GRAVEL, interbedded with silt an clay.
				Refusal at 20 ft bgs bit broken
				Blind advance to 28 ft bgs. Temporary well set, 5ft prepack 1-inch diameter PVC
				screen set at 23 - 28 ft bgs. GW sample (1041HP001A) collected at 25 - 28 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1041-1** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/9/2008 Drilling Completed 5/9/2008

Total Depth Drilled 28 Feet Hole Diameter 1.75 inches Collection times of samples 12:15 / 12:25

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 7-8 feet feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	36	0,0,0	0 - 0.5' asphalt and gravel fill
				0.5 - 3' orange brown CLAY with some gravel, stiff, dry (CL)
4	8'	48	0,0,0,0	0 - 2' orange brown CLAY with some gravel, stiff, dry (CL)
				2 - 4' orange brown CLAY, stiff, moist (CL)
				Hydropunch screen interval set at **24 - 28 ft bgs**. Very slow recharge.
				Sample 1041HP001(05092008) collected.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1041-2** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/9/2008 Drilling Completed 5/9/2008

Total Depth Drilled 57 Feet Hole Diameter 1.75 inches Collection times of samples 9:00 / 9:20

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 1- 2 feet, 7 - 8 feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	36	0,0,0	0 - 1' asphalt and gravel fill
				1 - 4' orange brown CLAY with little gravel, stiff, dry (CL)
4	8'	36	0,0,0	0 - 1' gravel fill
				1 - 3' orange brown CLAY with some gravel, medium loose, slightly moist (CL)
8	12'	18	0,0,0	0 - 0.5' orange brown CLAY with some gravel, medium loose, wet (CL)
				0.5 - 1.5' orange brown CLAY with some gravel, stiff, dry (CL)
12	16'	48	0,0,0,0	0 - 2' orange brown CLAY with gravel, loose, wet (CL)
				2 - 4' orange brown CLAY, very stiff, dry (CL)
16	20	24	0,0	0 - 0.5' orange brown CLAY, loose, moist (CL)
				0.5 - 2' orange brown CLAY, stiff, moist (CL)
20	24	48	0,0,0,0	0 - 1' orange brown CLAY, stiff, moist (CL)
				1 - 2.5' orange brown CLAY, stiff, wet (CL)
				3 - 4' orange brown CLAY with gravel, very loose, wet (CL)
				* continue to drill without recovery. Soft wet material encontered at 48 ft bgs.
				** REFUSAL at 57 ft bgs
				Hydropunch screen interval set **22 - 24 ft bgs**. PVC inserted and allowed 30 mins
				for charge. Sample 1041HP002(05082008) collected.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1041-3** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/9/2008 Drilling Completed 5/9/2008

Total Depth Drilled 24 Feet Hole Diameter 1.75 inches Collection times of samples 10:20 / 10:40

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 7-8 feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	18	0,0,0	0 - 0.5' asphalt and gravel fill
				0.5 - 1.5' orange brown CLAY with some gravel, stiff, dry (CL)
4	8'	48	0,0,0,0	0 - 1' orange brown CLAY with some gravel, stiff, dry (CL)
				1 - 2.5' brown CLAY with medium sand and gravel, medium loose (CL)
				2.5 - 4' orange brown CLAY, stiff, slightly moist (CL)
				Hydropunch screen interval set at **20 - 24 ft bgs**. Fair recharge rate.
				Sample 1041HP003(05092008) collected.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1041-4** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA | Drilling Started: 5/9/2008 | Drilling Completed: 5/9/2008

Total Depth Drilled: 21 Feet | Hole Diameter: 1.75 inches | Collection times of samples: 13:50 / 14:00

Length and Diameter of Coring Device: 4 feet / 1.75 inches | **Soil Sample Intervals**: 0 - 1 feet, 7 - 8 feet

Land-Surface Elev.: N/A feet | ☐ Surveyed | ☐ Estimated | Other: N/A

Drilling Fluid Used: N/A | Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies | Driller: Robert Stewart | Helper: --

Prepared By: Sandra Grabowski | Hammer Weight: -- | Hammer Drop: -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	18	0,0,0	0 - 0.5' top soil
				0.5 - 3' orange brown CLAY, stiff, dry (CL)
4	8'	48	0,0,0,0	0 - 2' orange brown CLAY, stiff, dry (CL)
				2 - 4' orange brown CLAY, stiff, moist (CL)
				REFUSAL at 22 ft bgs.
				Hydropunch screen set **17 - 21 ft bgs**. Fair water flow.
				Sample 1041HP002(05092008) collected.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-6 Project/No. RAPP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 6/25/2008 16:30 Drilling Completed 6/25/2008 16:35

Total Depth Drilled 1 Foot Hole Diameter 3 inches Type of Sample/ Coring Device hand auger

Length and Diameter of Coring Device 1 foot / 3 inches Sampling Interval 0.5 - 1 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method hand auger

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Sandra Grabowski Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	1	1	--	Hand-auger surface soil sample point. Lithology not recorded.
				Soil sample collected from 0.5 - 1 ft bgs
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-7 Project/No. RAPP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 6/25/2008 16:35 Drilling Completed 6/25/2008 16:40

Total Depth Drilled 1 Foot Hole Diameter 3 inches Type of Sample/ Coring Device hand auger

Length and Diameter of Coring Device 1 foot / 3 inches Sampling Interval 0.5 - 1 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method hand auger

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Sandra Grabowski Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	1	1	--	Hand-auger surface soil sample point. Lithology not recorded.
				Soil sample collected from 0.5 - 1 ft bgs
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-8 Project/No. RAPP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 6/25/2008 16:40 Drilling Completed 6/25/2008 16:45

Total Depth Drilled 1 Foot Hole Diameter 3 inches Type of Sample/ Coring Device hand auger

Length and Diameter of Coring Device 1 foot / 3 inches Sampling Interval 0.5 - 1 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method hand auger

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Sandra Grabowski Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	1	1	--	Hand-auger surface soil sample point. Lithology not recorded.
				Soil sample collected from 0.5 - 1 ft bgs

ARCADIS

Sample/Core Log

Boring/Well 1041-9 Project/No. RAPP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 6/26/2008 15:15 Drilling Completed 6/26/2008 15:25

Total Depth Drilled 10 Feet Hole Diameter 1.75 inches Type of Sample/ Coring Device geoprobe

Length and Diameter of Coring Device 5 feet / 1.75 inches Sampling Interval 7-8 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Michael Cobb/Sandra Grabowski Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	3.1	0.0	0 - 3.1 hard, medium brown SILT and CLAY, some gravel, angular, dry, (FILL).
5	10	3.5	0.0	0 - 1.2 medium dense fine SAND, some coarse sand, fine gravel, angular,
				dry to moist (FILL).
			0.0	1.2 - 1.8 broken sandstone cobble.
			0.0	1.8 - 3.5 yellow brown CLAY, little silt, relict rock fabric, stiff, moist.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-10 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 6/26/2008 15:30 Drilling Completed 6/26/2008 15:45

Total Depth Drilled 10 Feet Hole Diameter 1.75 inches Type of Sample/ Coring Device

Length and Diameter of Coring Device 5 feet / 1.75 inches Sampling Interval 7-8 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Sandra Grabowski/ Michael Cobb Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	2.6	0.0	0 - 1 asphalt and road bed.
			0.0	1 - 1.4 light brown, medium SAND, moist.
			0.0	1.4 - 2.6 yellow brown, very stiff, CLAY and SILT, little coarse sand and fine angular
				gravel floating in matrix, mottled yellow/greenish gray, moist.
5	10	4.2	0.0	0 - 0.5 SAA.
			0.0	0.5 - 2.5 yellowish brown CLAY, little silt, relict rock texture, mottled (some black and
				yellow).
			0.0	2.5 - 4.2 medium brown, hard, fissile weather rock, some dark coloring.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-11 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 6/26/2008 14:50 Drilling Completed 6/26/2008 15:05

Total Depth Drilled 10 Feet Hole Diameter 1.75 inches Type of Sample/ Coring Device

Length and Diameter of Coring Device 5 feet / 1.75 inches Sampling Interval 8-9 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other: Duplicate soil sample collected

Drilling Fluid Used NA Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Michael Cobb/ Sandra Grabowski Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (iFeet)	PID Reading (ppm)	Sample/Core Description
0	5	2.5	0.0	0 - 0.6 gravel, loose road surface.
			0.1	0.6 - 2.5 yellow brown CLAY and SILT, little coarse sand, fine gravel, miscellaneous
				rock types, moist, medium stiff.
5	10	5		(first attempt- no recovery)
			0.0	0 - 2.5 yellow brown SAND and CLAY, little gravel, stiff, moist (FILL).
			0.3	2.5 - 4.5 yellow brown soft CLAY, little silt, trace sand and fine gravel, moist, wet.
			0.1	4.5 - 5 SAA, black mottled, possible relict rock texture, trace coarse sand, moist.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-14 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA
Drilling Started: 6/26/2008 15:55
Drilling Completed: 6/26/2008 16:05

Total Depth Drilled: 10 Feet
Hole Diameter: 1.75 inches
Type of Sample/ Coring Device:

Length and Diameter of Coring Device: 5 feet / 1.75 inches
Sampling Interval: 6 - 7 feet

Land-Surface Elev.: NA feet ☐ Surveyed ☐ Estimated Other: NA

Drilling Fluid Used: NA
Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies
Driller: Josh K
Helper: NA

Prepared By: Michael Cobb/ Sandra Grabowski
Hammer Weight: NA
Hammer Drop: NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	2.2	0.0	0 - 0.6 asphalt/road bed.
				0.6 - 2.2 yellow brown fine SAND, trace fine gravel, moist (FILL).
5	10	3	0.0	0 -0.5 SAA with increased gravel content (FILL).
			0.7	0.5 - 3 yellow brown CLAY and SILT, stiff, moist, relict rock fabric.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-15 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 2

Site Location Radford, VA Drilling Started 6/25/2008 12:40 Drilling Completed 6/22/2008 13:30

Total Depth Drilled 20 Feet Hole Diameter 1.75 inches Type of Sample/ Coring Device

Length and Diameter of Coring Device 5 feet / 1.75 inches Sampling Interval 12-12.5 (13:10); 18-18.5 (13:30) feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Michael Cobb/ Sandra Grabowski Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	1.6	0.5	0 - 0.6' gravel and roadbed (FILL).
			0.1	0.6 - 1.6' yellowish brown, medium stiff, SILT with little clay, little fine to coarse sand,
				gravel, likely FILL.
5	10	5	0.5	0 - 1' SAA, yellowish brown SILT, little clay, trace fine to coarse sand and gravel,
				moist, medium stiff.
			0.0	1 - 2' medium brown, SILT, little clay, trace fine to coarse sand and gravel, moist,
				medium stiff.
			0.0	2' medium brown SILT/CLAY, some coarse sand, fine gravel, subrounded.
			0.0	2 - 4' stiff, yellowish brown, CLAY, little silt, trace coarse sand, fine angular gravel,
				highly plastic, residuum.
10	15	5	0.0	0 - 2' SAA with increasing gravel, appears to have bedrock texture (saprolite) but
				no strength, weathered.
			0.0	2 - 2.7' moist to wet, red brown, CLAY and SILT, little coarse sand, fine gravel, rock
				fragments.
			0.0	2.7 - 5' yellowish brown CLAY and SILT, little coarse sand, fine gravel as angular
				rock fragments, stiff, moist, relict rock structure.
15	20	5	0.0	0 -4.6, SAA, wet.
			0.0	4.6 - 5' hard, crumbly, decomposed rock as CLAY, dry.

ARCADIS

Sample/Core Log (Cont.d)

Boring/Well 1041-15 Page 2 of 2

Prepared by Michael Cobb/ Sandra Grabowski

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppm)	Sample/Core Description
				Refusal at 20 ft bgs
				Temporary 5 ft screen PVC well was set at 15 - 20 ft bgs.
				GW sample (1041HP015) collected by Hydropunch sampler from 15-20 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-16 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 6/26/2008 9:50

Drilling Completed 6/26/2008 11:15

Total Depth Drilled 28.5 Feet

Hole Diameter 1.75 inches

Type of Sample/ Coring Device

Length and Diameter of Coring Device 5 feet / 1.75 inches

Sampling Interval NA feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated

Other NA

Drilling Fluid Used NA

Drilling Method geoprobe

Drilling Contractor Columbia Technologies

Driller Josh K

Helper NA

Prepared By Sandra Grabowski/ Michael Cobb

Hammer Weight NA

Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	1.1	0.0	0 - 1' asphalt and gravel road
5	10	3	0.0	0 - 0.6' dense SILT/CLAY with coarse sand and gravel, moist, medium brown (FILL).
			0.0	0.6 - 1.3' medium brown, medium dense, fine to medium SAND, well sorted.
			0.0	1.3 - 2.2' fine to medium GRAVEL, fine sand, silt matrix, dense, moist, medium brown.
			0.0	2.2 - 3' deep red brown, medium stiff, CLAY and SILT, weathered rock fabric,
				possible relict rock structure (bedded), moist to wet, highly plastic.
10	15	5	0.0	0 - 5' yellowish brown CLAY, little silt, trace coarse sand, fine gravel, weathered rock
				fabric (laminated), very stiff, intervals of black laminated decompossed rock at 2.6'
				and 3.7', smoist to wet throughout, (decomposed rock as angular gravel, breaks and
				crumbles to clay size).
15	20	4.7	0.0	1.5 - 4.7' similar to above, yellow brown CLAY, weathered rock fabric/laminated, intervals
				of black at at 2.5 and 4.4-4.7, moist to wet, trace coarse sand, fine gravel, some green
				lamination/black lines throughout, wet at 4-4.7'.
20	25	5	0.0	0 - 1' SAA, wet, increased gravel content.
			0.0	1 - 5' yellowish brown to medium brown, very stiff to hard CLAY, little silt, little fine
				gravel, moist to wet, relict bedrock stucture, lamination visible, some intervals of deep
				reddish-brown.
25	30	3.5	0.0	0 - 3' SAA, hard, decomposed rock. Color changes to dark brown 27.8-28 ft.

ARCADIS

Sample/Core Log (Cont.d)

Boring/Well 1041-16 Page 2 of 2

Prepared by Sandra Grabowski/ Michael Cobb

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
				Refusal at 28.5 ft bgs
				Temporary 5 ft screen PVC well was set at 23 - 28 ft bgs.
				GW sample (1041HP016) collected by Hydropunch sampler from 17-28 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-17 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 2

Site Location Radford, VA Drilling Started 6/26/08 17:00 Drilling Completed 6/26/08 18:15

Total Depth Drilled 34 Feet Hole Diameter 1.75 inches Type of Sample/ Coring Device

Length and Diameter of Coring Device 5 feet / 1.75 inches Sampling Interval NA feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Michael Cobb Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	1	0.0	Poor recovery. Roadbed and gravel.
5	10	0.1	0.1	Poor recovery. Medium brown, soft, CLAY, little silt, trace angular gravel (possible
				weathered rock).
10	15	4.9	0.0	0 - 1.2' yellow brown CLAY, little silt, moist, medium soft, bedrock texture, no gravel
				fragments.
			0.1	1.2 - 3' yellow brown SILT, little clay, no distinct structure/texture, medium soft, moist.
			0.0	3 - 5' yellow brown CLAY, little silt, fissile rock fragment, rock texture (bedded),
				moist, stiff.
15	20	4.8	0.0	0 - 2.5' SAA (1.6 - 2' brown rock fragments as coarse sand and fine angular gravel).
				2.5 - 4.8 very stiff, reddish brown, weathered rock as CLAY and SILT, structure
				indistinct, moist to wet.
20	25	3.6	0.1	0 - 3' yellowish brown, red and black mottling, stiff, weathered rock as CLAY, little
				silt, rock fabric apparent, trace angular gravel, otherwise rock decomposed to silt
				and clay.
			0.2	3 -3.6' yellowish brown weathered rock as SILT, little clay trace angular rock
				fragments, indistinct fabric, moist-to-wet.
25	30	3	0.0	Liner stuck in barrel, tools are wet, material on top is SAA.
				Driller tries stop-pin system to continue.

ARCADIS

Sample/Core Log (Cont.d)

Boring/Well 1041-17 Page 2 of 2

Prepared by Michael Cobb

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
30	35	3	0.1	0 - 2' medium soft, wet, CLAY, little silt, little coarse sand, fine gravel as rock
				fragments (weathered rock).
			0.1	2 - 3' very stiff, weathered rock as CLAY, little silt, fissile rock fragments, distinct
				rock fabric.
				Refusal at 34 ft bgs
				Two GW samples (1041HP017) were collected by Hydropunch sampler
				from 22-25 and 30-33 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-18 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 2

Site Location Radford, VA Drilling Started 6/27/2008 10:05 Drilling Completed 6/27/2008 12:00

Total Depth Drilled 38.5 Feet Hole Diameter 1.75 inches Type of Sample/ Coring Device

Length and Diameter of Coring Device 5 feet / 1.75 inches Sampling Interval 6-7 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other Duplicate groundwater sample collected

Drilling Fluid Used NA Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Sandra Grabowski/ Michael Cobb Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
0	5	1.9	0.0	0 - 1' gravel/asphalt/roadbed.
			0.0	1 - 1.5' yellow brown, medium soft, CLAY, little silt, coarse sand/gravel (FILL), moist.
5	10	1.8	0.0	0 - 0.5' SAA.
			0.0	0.5 - 2' yellow brown, medium soft, dry to moist, CLAY, little silt, trace coarse sand, (no fill
				traces), highly plastic.
10	15	5	0.0	0 - 1.3' SAA with black angular gravel (1.7-1.3' likely FILL).
			0.0	1.3 - 2.8' residuum/weathered rock, medium brown, medium plastic, CLAY, little silt, fissle
				rock fragment, little relict rock fabric, all coarse granular material, can be broken up with
				fingers, moist.
			0.0	2.8 - 4' hard weathered rock and CLAY and SILT, yellow brown, red and black laminations
				(bedding), fissile rock fragments, dry.
			0.0	4 - 5' weathered rock, yellow brown, soft to medium soft, plastic, CLAY, little silt, little
				angular gravel (rock fragments). Note that most fragments can be broken by hand.
15	20	3.2	0.0	0 - 1' yellow brown, very stiff, CLAY, little silt, dry to moist, some relict bedding/lamination
				highly plastic, little angular rock fragments, brittle, broken by hand.
			0.0	1 - 2.8' SAA but hard and some mottling (black and gray, red brown).
			0.0	2.8 - 3.2' SAA with little fine sand.
20	25	5	0.0	0 - 1' yellow brown, medium soft, CLAY, highly plastic, some mottling (black), trace fine
				angular gravel, moist.
			0.0	1 - 2' yellow brown, loose CLAY, wet, little fine to medium gravel.
			0.0	2 - 3.5' yellow brown, hard, SILT with CLAY, trace sand, dry, some mottling (red, black,

ARCADIS

Sample/Core Log (Cont.d)

Boring/Well 1041-18 Page 2 of 2

Prepared by SG/MC

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID Reading (ppm)	Sample/Core Description
				pale green), rock fragments broken by hand, medium plastic.
			0.0	3.5 - 4.4' dark brown SILT with little clay, hard, dry, fine rock fragments,
				medium plasticity.
			0.0	4.4 - 5' yellow brown, moist, CLAY with some silt, hard.
25	30	4.4	0.0	0 - 1.8' SAA.
			0.0	1.8 - 2.8' yellow brown, CLAY, little silt, medium loose, wet, little fine grained rock
				fragments (breakable by hand).
			0.0	2.8 - 4.4' hard, yellow/orange, mottled (black), large fragments of rock,
				moist, CLAY with little silt.
30	35	4.6	0.0	0 - 1' SAA.
				1 - 2' yellow brown, loose, CLAY and SILT, wet, plastic, black mottling, trace medium to
				coarse sand.
			0.0	2 - 4.6' yellowish brown, weathered rock, dark gray, deep red brown and some light gray
				laminations, relict rock structure, hard, dry to moist, trace medium sand.
35	40	4	0.0	0 - 0.4' SAA.
			0.0	0.4 - 2' yellow brown, loose, moist to wet, CLAY, trace coarse sand sized rock fragments
				(broken by hand) plastic.
			0.0	2 - 4' yellow brown, CLAY, little silt, relict rock fabric, stiff to medium loose, lamination
				(deep red and dark gray), moist to wet, little gravel/rock fragments.
				Refusal at 38.5 ft bgs
				Two GW samples (1041HP018) were collected by Hydropunch sampler
				from 22-25 and 31-34 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well 1041-19 Project/No. RAAP/ GP08RAAP.0047.DF000 Page 1 of 2

Site Location Radford, VA Drilling Started 6/29/08 10:50 Drilling Completed 6/29/08 11:35

Total Depth Drilled 28.5 Feet Hole Diameter 1.75 inches Type of Sample/ Coring Device

Length and Diameter of Coring Device 5 feet / 1.75 inches Sampling Interval 6-7 feet

Land-Surface Elev. NA feet ☐ Surveyed ☐ Estimated Other NA

Drilling Fluid Used NA Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Josh K Helper NA

Prepared By Sandra Grabowski/ Michael Cobb Hammer Weight NA Hammer Drop NA ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID/FID Reading (ppm)	Sample/Core Description
0	5	3	0.0 / 0.0	0 - 2.3' asphalt/gravel/roadbed.
			0.0 / 0.0	2.3 - 3' medium brown, fine SAND, trace silt and clay, medium stiff, dry to moist.
5	10	2	0.0 / 0.0	0 - 0.6' SAA.
			0.0 / 0.0	0.6 - 2' brown CLAY, medium soft, moist, little fine gravel, coarse sand, highly plastic.
10	15	2.6	0.0 / 0.0	0 - 1.5' yellow brown, medium soft CLAY, little coarse sand and fine
				gravel, angular and subrounded, trace coarse gravel, moist (probable FILL).
			0.0 / 0.0	1.5 - 2.4' SILT and CLAY, some gravel, mixed rock types.
			0.0 / 0.0	2.4 - 2.6' brown, fine to medium SAND, likely FILL, moist.
15	20	3.9	0.0 / 0.0	0 - 0.2' SAA.
			0.0 / 0.0	0.2 - 1.8' medium soft, debris (wood and brick) at 1.8'.
			0.0 / 0.0	1.8 - 2.2' weathered rock, broken reddish brown rock fragments, some silt and clay.
			0.0 / 0.0	2.2 - 3.9' yellowish brown CLAY, hard, distinct bedrock fabric,
				little fissile rock fragments as gravel, moist (weathered rock).
20	24.5	4.5	0.0 / 0.0	0 - 1' yellowish brown, SAA.
			0.0 / 0.0	1 - 1.5' yellowish brown, very soft, sticky, wet, CLAY, trace sand and fine gravel.
			0.0 / 0.0	1.5 - 2' yellow brown stiff CLAY, bedrock fabric, wet.
			0.0 / 0.0	2 - 3' yellowish brown, very soft CLAY, sticky, trace coarse sand, fine gravel, wet.
			0.0 / 0.0	3 - 4.2' medium soft, yellowish brown, CLAY, little bedrock fabric, little rock fragments
				as fine gravel, wet.
			0.0 / 0.0	4.2 - 4.5' very stiff, yellowish brown, wet, CLAY, clear bedrock fabric, trace gravel
				sized rock fragments.

ARCADIS

Sample/Core Log (Cont.d)

Boring/Well 1041-19 Page 2 of 2

Prepared by SG/MC

Sample/Core Depth (feet below land surface) From	To	Core Recovery (Feet)	PID/FID Reading (ppm)	Sample/Core Description
24.5	28.5	4.2	0.0 / 0.0	0 - 2.6' yellow brown weathered rock as CLAY, stiff, wet, moist, bedrock fabric
				apparent, trace angular rock fragments.
			0.0 / 0.0	2.6 - 3.8' very soft, sticky, CLAY, trace to little sand and fine gravel, wet.
			0.0 / 0.0	3.8 - 4.2' yellow brown and brown weathered rock, medium soft clay, moist,
				distinct rock fabric (thin bedded).
				Refusal at 28.5 ft bgs
				Temporary 5 ft screen PVC well was set at 23 - 28 ft bgs.
				GW sample (1041HP019) collected by Hydropunch sampler from 18-28 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1549-1** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA | Drilling Started: 5/7/2008 | Drilling Completed: 5/7/2008

Total Depth Drilled: 32 Feet | Hole Diameter: 1.75 inches | Collection times of samples: 10:40 / 10:50

Length and Diameter of Coring Device: 4 feet / 1.75 inches | **Soil Sample Intervals**: 0.5-1.5 7-8 feet

Land-Surface Elev.: N/A feet | ☐ Surveyed | ☐ Estimated | Other: Duplicate soil sample collected

Drilling Fluid Used: N/A | Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies | Driller: Robert Stewart | Helper: --

Prepared By: Sandra Grabowski | Hammer Weight: -- | Hammer Drop: -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	24	0,0,0	0 - 0.5' asphalt and gravel
				0.5 - 2' reddish brown CLAY with little gravel, stiff, dry (CL)
4	8'	48	0,0,0,0	0 - 0.5' reddish brown CLAY with little gravel, stiff, dry (CL)
				0.5 - 1.5' brown clayey SILT, very dense, dry (ML)
				1.5 - 2' olive grey CLAY, medium soft, dry (CL)
				2 - 4' orangish brown CLAY, very stiff, dry (CL)
				Hydropunch screen interval set from 28 - 32 ft bgs. No water enters screen.
				No groundwater sample collected.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1549-3** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA | Drilling Started: 5/7/2008 | Drilling Completed: 5/7/2008

Total Depth Drilled: 27 Feet | Hole Diameter: 1.75 inches | Collection times of samples: 10:00 / 15:00

Length and Diameter of Coring Device: 4 feet / 1.75 inches | **Soil Sample Intervals**: 0.5-1.5 5-6 feet

Land-Surface Elev.: N/A feet | ☐ Surveyed | ☐ Estimated | Other: N/A

Drilling Fluid Used: N/A | Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies | Driller: Robert Stewart | Helper: --

Prepared By: Sandra Grabowski | Hammer Weight: -- | Hammer Drop: -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	24	0,0	0 - 0.5' asphalt and gravel
				0.5 - 2' brown CLAY, stiff, dry (CL)
4	8'	36	0,0,0	0 - 1' brown CLAY with some gravel, medium loose, moist (CL)
				1 - 2' brown CLAY, dry, stiff (CL)
				2 - 3' orange brown CLAY, dry, stiff (CL)
				Hydropunch screen interval set from 23 - 27 ft bgs. No water enters screen.
				No groundwater sample collected.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1549-3 (2)** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA | Drilling Started: 5/7/2008 | Drilling Completed: 5/7/2008

Total Depth Drilled: 49.5 Feet | Hole Diameter: 1.75 inches | Sampling Intervals: N/A: boring advanced for lithology

Length and Diameter of Coring Device: 4 feet / 1.75 inches

Land-Surface Elev.: N/A feet ☐ Surveyed ☐ Estimated Other: N/A

Drilling Fluid Used: N/A | Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies | Driller: Robert Stewart | Helper: --

Prepared By: Sandra Grabowski | Hammer Weight: -- | Hammer Drop: -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	24	0,0	0 - 0.5' asphalt and gravel
				0.5 - 2' brown CLAY, stiff, dry (CL)
4	8'	36	0,0,0,0	0 - 1' olive grey and brown CLAY with gravel, stiff, dry (CL)
				1 - 2' brown CLAY, soft to medium soft, slighly moist (CL)
				2 - 4' orange brown CLAY, very stiff, dry (CL)
8	12'	0	--	NO RECOVERY - liner crushed; smaple lost
12	16'	48	0,0,0,0	0 - 1' olive grey CLAY, medium soft, slightly moist (CL)
				1 - 4' orange brown sandy CLAY, stiff, dry (CL)
16	20'	48	0,0,0,0	0 - 1.5' orange brown sandy CLAY, stiff, dry (CL)
				1.5 - 2.5' brown CLAY with some sand, soft, moist (CL)
				2.5 - 3.9' brown sandy CLAY with some gravel, moist, stiff (CL)
				3.9 - 4' large quartz cobbles
20	24'	48	0,0,0,0	0 - 2' brown sandy CLAY with little gravel, loose to medium loose, wet (CL)
				2 - 4' brown CLAY, very stiff, moist (CL)
				Due to time constraints continued blind push to refusal at 49.5 ft bgs.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1549-4** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/7/2008 Drilling Completed 5/7/2008

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Collection times of samples 11:45 / 12:00

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 5-6 feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	42	0,0,0,0	0 - 0.5' asphalt
				0.5 - 3.5' reddish brown and brown CLAY, little gravel, stiff, dry (CL)
4	8'	24	0,0	0 - 0.5' reddish brown and brown CLAY, little gravel, stiff, dry (CL)
				0.5 - 1' reddish brown CLAY with gravel, mosit (CL)
				1 - 2' brown to olive grey clayey SILT, very dense, dry (ML)
				Hydropunch screen interval set from 4 - 8 ft bgs. No water enters screen.
				No groundwater sample collected.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1549-6** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location Radford, VA Drilling Started 5/7/2008 Drilling Completed 5/7/2008

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Collection times of samples 12:15 / 12:25

Length and Diameter of Coring Device 4 feet / 1.75 inches **Soil Sample Intervals** 0.5-1.5 5-6 feet feet

Land-Surface Elev. N/A feet ☐ Surveyed ☐ Estimated Other N/A

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor Columbia Technologies Driller Robert Stewart Helper --

Prepared By Sandra Grabowski Hammer Weight -- Hammer Drop -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
0	4'	24	0,0	0 - 0.5' asphalt
				0.5 - 2' brown CLAY, little gravel, stiff, dry (CL)
4	8'	36	0,0,0	0 - 1' brown CLAY, little gravel, stiff, dry (CL)
				1 - 2' brown to orange brown CLAY, stiff, dry (CL)
				2 - 3' reddish brown CLAY, stiff, dry (CL)
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **1549-7** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA | Drilling Started: N/A | Drilling Completed: N/A

Total Depth Drilled: 4 Feet | Hole Diameter: N/A inches | Collection times of samples: N/A

Length and Diameter of Coring Device: N/A | **Soil Sample Intervals**: N/A feet

Land-Surface Elev.: N/A feet | ☐ Surveyed | ☐ Estimated | Other: Duplicate soil gas sample collected

Drilling Fluid Used: N/A | Drilling Method: N/A

Drilling Contractor: -- | Driller: -- | Helper: --

Prepared By: Sandra Grabowski | Hammer Weight: -- | Hammer Drop: -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
				Boring advanced for soil gas collection. No soil or water samples collected.
				Soil gas sample collected 5/7/08 14:30.

ARCADIS

Sample/Core Log

Boring/Well **1549-8** Project/No. Radford Army Ammunition Plant / GP08RAAP.0047.DF000 Page 1 of 1

Site Location: Radford, VA | Drilling Started: 5/8/2008 | Drilling Completed: 5/8/2008

Total Depth Drilled: 30 Feet | Hole Diameter: 1.75 inches | Collection times of samples: N/A

Length and Diameter of Coring Device: 4 feet / 1.75 inches | **Soil Sample Intervals**: N/A feet

Land-Surface Elev.: N/A feet | ☐ Surveyed | ☐ Estimated | Other: N/A

Drilling Fluid Used: N/A | Drilling Method: geoprobe

Drilling Contractor: Columbia Technologies | Driller: Robert Stewart | Helper: --

Prepared By: Sandra Grabowski | Hammer Weight: -- | Hammer Drop: -- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (inches)	PID Reading (ppb)	Sample/Core Description
				Blind drill to 30 ft bgs. Temporary PVC installed. Slow recharge.
				Groundwater sample (1549 HP008) collected at 25 - 30 bgs on 5/10/08.

Appendix C

Sampling Logs

(Soil Gas and Groundwater)

ARCADIS

Subslab Sample Collection Log

		Sample ID:	**1549SLB00A(050608)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Bosch hammer drill
Project:	RAAP 047	**Sealant:**	clay
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	--
Samplers:	MW	**Subcontractor:**	N/A
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	
Sampling Depth:	~6" slab	**Approximate Purge Volume and Method:**	3 mins at 100 mL / min
Time and Date of Collection:	5/6/2008		1632 - 1636

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
1649	-27"Hg	78	15%	0	28.22	64
1715	-5"Hg					

SUMMA Canister Information:

Size : **6 L**

Canister ID: 000001926

Flow Controller ID: FC00778

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1549SG001(050708)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	moist
Sampling Depth:	5 ft bgs	**Approximate Purge Volume and Method:**	6 mins at 100 mL/min
Time and Date of Collection:	5/7/2008 10:56		11:34 - 11:40

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
11:40	-28"Hg	68	44%	--	28.22	
11:47	-19"Hg					
11:56	-8"Hg					
12:00	-6"Hg					
12:05	-4"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003967

Flow Controller ID: FC00239

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1549SG003(050708)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	moist
Sampling Depth:	5 ft bgs	**Approximate Purge Volume and Method:**	10 mins at 45 mL/min
Time and Date of Collection:	5/7/2008		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
10:33	-28"Hg	68	41%	--	28.23	
10:46	-15"Hg					
10:53	-9"Hg					
10:58	-6"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000000724

Flow Controller ID: FC00911

General Observations/Notes:

Tight soil, tough to pull needed purge rate
Sample seems to be collecting

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1549SG004(050708)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	moist
Sampling Depth:	5 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 120 mL/min
Time and Date of Collection:	5/7/2008 12:09		12:12 - 12:17

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
12:17	-26"Hg	77	23%	--	28.19	
12:21	-20"Hg					
12:29	-11"Hg					
12:37	-5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000000683

Flow Controller ID: FC00549

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

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Soil Gas Sample Collection Log

		Sample ID:	**1549SG006(050708)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	
Sampling Depth:	5 ft bgs	**Approximate Purge Volume and Method:**	8 mins at 70 mL/min
Time and Date of Collection:	5/7/2008 12:51		12:52 - 13:00

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
13:00	-29"Hg	80	18%	--	28.16	
13:19	-8"Hg					
13:26	-5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 0000001085

Flow Controller ID: FC00768

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1549SG007(050708)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100 mL/min
Time and Date of Collection:	5/7/2008 14:28		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
14:41	-28"Hg	82				
15:05	-8"Hg					
15:10	-6"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003258

Flow Controller ID: FC00647

General Observations/Notes:

Duplicate Sample Collected - 1549DUP001(050708)

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1549DUP001(050708)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100 mL/min
Time and Date of Collection:	5/7/2008 14:28		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
14:41	-26"Hg	82				
15:05	-5"Hg					
15:10	-3.5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000001417

Flow Controller ID: FC006672

General Observations/Notes:

Parent Sample - 1549SG007(050708)

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1549SG008(050708)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1549	**Moisture Content of Sampling Zone:**	
Sampling Depth:	3 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100 mL/min
Time and Date of Collection:	5/7/2008		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
14:00	-29"Hg	82	5%	--	28.13	
14:05	-24"Hg					
14:27	-7"Hg					
14:31	-5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003328

Flow Controller ID: FC00236

General Observations/Notes:

No airflow at first location. Moved over 5 feet and set shallower.

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1041SLB00A(050608)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Bosch hammer drill
Project:	RAAP 047	**Sealant:**	clay
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	--
Samplers:	MW	**Subcontractor:**	N/A
Sample Point Location:	Building 1041	**Moisture Content of Sampling Zone:**	
Sampling Depth:	~ 6 ft bgs	**Approximate Purge Volume and Method:**	3 mins at 100 mL / min
Time and Date of Collection:	5/6/2008 9:50		10:02 - 10:05

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
10:07	> -30"Hg	64	44%	0	28.3	94
10:25	-16"Hg					
10:37	-9"Hg					

SUMMA Canister Information:

Size : **6 L**

Canister ID: 000002317

Flow Controller ID: 000006842

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1041SG001(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1041	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100 mL/min
Time and Date of Collection:	5/8/2008 12:45		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
12:57	-28"Hg	74	63%	--	28.03	152
13:11	-14"Hg					
13:27	-5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003307

Flow Controller ID: FC00228

General Observations/Notes:

location between buildinds 1041 and 1034

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

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Soil Gas Sample Collection Log

		Sample ID:	**1041SG002(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1041	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	
Time and Date of Collection:	5/8/2008 12:30		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
11:35	-29"Hg	72	57%	--	28.05	
11:55	-9"Hg					
12:02	-5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003190

Flow Controller ID: FC00284

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

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Soil Gas Sample Collection Log

		Sample ID:	**1041SG003(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1041	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	
Time and Date of Collection:	5/8/2008 12:14		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
12:14	-27"Hg	72	57%	--	28.03	1520
12:35	-8"Hg					
12:38	-5.5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003204

Flow Controller ID: FC00456

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1041SG004(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1041	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	
Time and Date of Collection:	5/8/2008 12:30		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
12:35	-28"Hg	73	57%	--	28.03	310
12:50	-12"Hg					
12:55	-8"Hg					
12:59	-6"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003319

Flow Controller ID: FC00259

General Observations/Notes:

Sample location behind building 1041, near horseshoe pits

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Subslab Sample Collection Log

Sample ID: 1034SLB00A(050608)

Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Bosch hammer drill
Project:	RAAP 047	**Sealant:**	clay
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	--
Samplers:	MW	**Subcontractor:**	N/A
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	dry
Sampling Depth:	~6" slab	**Approximate Purge Volume and Method:**	3 mins at 100 mL / min
Time and Date of Collection:	5/8/2008		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
11:06	-29"Hg	72	57%	--	28.06	0
11:18	-21"Hg					
11:31	-12"Hg					
11:41	-7"Hg					

SUMMA Canister Information:

Size : **6 L**

Canister ID: 000002364

Flow Controller ID: FC00717

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Subslab Sample Collection Log

		Sample ID:	**1034SLB00B(050608)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Bosch hammer drill
Project:	RAAP 047	**Sealant:**	clay
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	--
Samplers:	MW	**Subcontractor:**	N/A
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	dry
Sampling Depth:	~6" slab	**Approximate Purge Volume and Method:**	3 mins at 100 mL / min
Time and Date of Collection:	5/8/2008		10:02 - 10:05

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
11:05	-28"Hg	72	57%	--	28.06	0
11:18	-20"Hg					
11:31	-13"Hg					
11:41	-7"Hg					

SUMMA Canister Information:

Size : **6 L**

Canister ID: 000002408

Flow Controller ID: FC00229

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1034SG001(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	
Sampling Depth:	3.5 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100mL/min
Time and Date of Collection:	5/8/2008 15:20		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
15:18	-28"Hg		27%	--	27.96	3
15:33	-10"Hg					
15:42	-4"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000000645

Flow Controller ID: FC00698

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1034SG002(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100mL/min
Time and Date of Collection:	5/8/2008 14:20		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
14:29	-26"Hg	74	44%	--	27.97	
14:44	-10"Hg					
14:52	-4"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000000689

Flow Controller ID: FC00580

General Observations/Notes:

Sample location near door, between buildings 1034 and 2051

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1034SG004(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	moist
Sampling Depth:	3.5 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100mL/min
Time and Date of Collection:	5/8/2008 08:44		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
9:05	-28"Hg	67	78%	--	28.06	219
9:12	-18"Hg					
9:19	-12"Hg					
9:23	-9"Hg					
9:29	-6"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000003197

Flow Controller ID: FC00320

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1034SG006(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100mL/min
Time and Date of Collection:	5/8/2008		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
16:51	-26.5"Hg	75	28%	--	27.92	600
17:04	-11"Hg					
17:10	-6.5"Hg					
17:15	-3.5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000005593

Flow Controller ID: 6755

General Observations/Notes:

sample location between buildings 1034 and 1041 on hill by old motors

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1034SG007(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100mL/min
Time and Date of Collection:	5/8/2008		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
16:34	-27"Hg	75	26%	--	27.93	288
16:58	-4"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000001155

Flow Controller ID: FC00433

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

ARCADIS

Soil Gas Sample Collection Log

		Sample ID:	**1034SG008(050808)**
Client:	Radford Army Ammunition Plant	**Boring Equipment:**	Geoprobe
Project:	RAAP 047	**Sealant:**	
Location:	Radford, VA	**Tubing Information:**	teflon
Project #:	GP08RAAP.0047.DF000	**Miscellaneous Equipment:**	N/A
Samplers:	MW	**Subcontractor:**	Columbia Technologies
Sample Point Location:	Building 1034	**Moisture Content of Sampling Zone:**	
Sampling Depth:	4 ft bgs	**Approximate Purge Volume and Method:**	5 mins at 100mL/min
Time and Date of Collection:	5/8/2008		

Instrument Readings:

Time	Canister Pressure (inches of HG)	Temperature (F)	Relative Humidity (%)	Air Speed (ft/min)	Barometric Pressure (inches of Hg)	PID (ppb)
16:04	-27"Hg	80	2000%	--	27.95	4.5
16:16	-13"Hg					
16:24	-6"Hg					
16:26	-5"Hg					

SUMMA Canister Information:

Size : **1 L**

Canister ID: 000000654

Flow Controller ID: FC00465

General Observations/Notes:

Approximate One-Well Volume (for purging): When using a 1 1/4 inch "Dummy Point" and a 6-inch sampling interval, sampling space will have a volume of approximately 150 mL. Each foot of 1/4-inch tubing will have a volume of approximately 10 mL.

Please record current weather information including wind speed and direction, ambient temperature, barometric pressure, and relative humidity via suitable information source (e.g., weatherunderground.com).

1549-9

EXAMPLE MAP FILE AND PURGING LOGBOOK FORM 10.2-d
GROUNDWATER SAMPLES

WELL COORD. OR ID 1549-10 SAMPLE NO. _____
WELL/SITE DESCRIPTION _____

X-COORD. _____ Y-COORD. _____ ELEV. _____ UNITS
DATE 7/8/09 TIME 10:15 AIR TEMP.

temp: WELL DEPTH 30 FT. ____ IN. CASING HT. ____ FT. ____ IN. screen 20-30'
WATER DEPTH ~~26 FT. by~~ SN. WELL DIAMETER ~~_____~~ IN.
WATER COLUMN HEIGHT _____ FT. _____ IN. SANDPACK DIAM. _____ IN.
EQUIVALENT VOLUME OF STANDING WATER _____ (GAL) (L)
VOLUME OF BAILER _____ (GAL) (L) or PUMP RATE _____ (GPM) (LPM)
TOTAL NO. OF BAILERS (5 EV) _____ or PUMP TIME _____ MIN.
WELL WENT DRY? [Yes] [No] NUM. OF BAILERS _____ or PUMP TIME
VOL. REMOVED _____ (GAL) (L) RECOVERY TIME
PURGE AGAIN? [Yes] [No] TOTAL VOL. REMOVED _____ (GAL) (L)

DATE & TIME	QUANTITY REMOVED	TIME REQ'D	pH	Cond	Temp	ORD	Turb	DO	Character of water (color / clarity / odor / partic.)
(before) (1030)							>1100		brown, cloudy
(during)	collected before sample								
(during)									
(during									
(after)									

COMMENTS _____
SIGNATURE _____

2 bottles: sample filtered / unfiltered
1549-10(20-30)(070809) at 1030



Sample ID – 1549-10

1549-10

EXAMPLE MAP FILE AND PURGING LOGBOOK FORM 10.2-d
GROUNDWATER SAMPLES

WELL COORD. OR ID 1549-9 SAMPLE NO. _____

WELL/SITE DESCRIPTION _____

X-COORD. _____ Y-COORD. _____ ELEV. _____ UNITS

DATE 8/8/09 TIME 11:05 AIR TEMP.

temp WELL DEPTH 29 FT. bgs ~~IN.~~ ~~CASING HT. ____ FT. ____ IN.~~ screen set 19-29 ftbgs

WATER DEPTH ~26 FT. ~~IN.~~ WELL DIAMETER _____ IN.

WATER COLUMN HEIGHT _____ FT. _____ IN. SANDPACK DIAM. _____ IN.

EQUIVALENT VOLUME OF STANDING WATER _____ (GAL) (L)

VOLUME OF BAILER _____ (GAL) (L) or PUMP RATE _____ (GPM) (LPM)

TOTAL NO. OF BAILERS (5 EV) _____ or PUMP TIME _____ MIN.

WELL WENT DRY? [Yes] [No] NUM. OF BAILERS _____ or PUMP TIME

VOL. REMOVED _____ (GAL) (L) RECOVERY TIME

PURGE AGAIN? [Yes] [No] TOTAL VOL. REMOVED _____ (GAL) (L)

DATE & TIME	QUANTITY REMOVED	TIME REQ'D	pH	Cond	Temp	ORD	Turb	DO	Character of water (color / clarity / odor / partic.)
(before) sampling	[illegible]		11:15				>100		brown, cloudy
(during)									
(during)									
(during									
(after)									

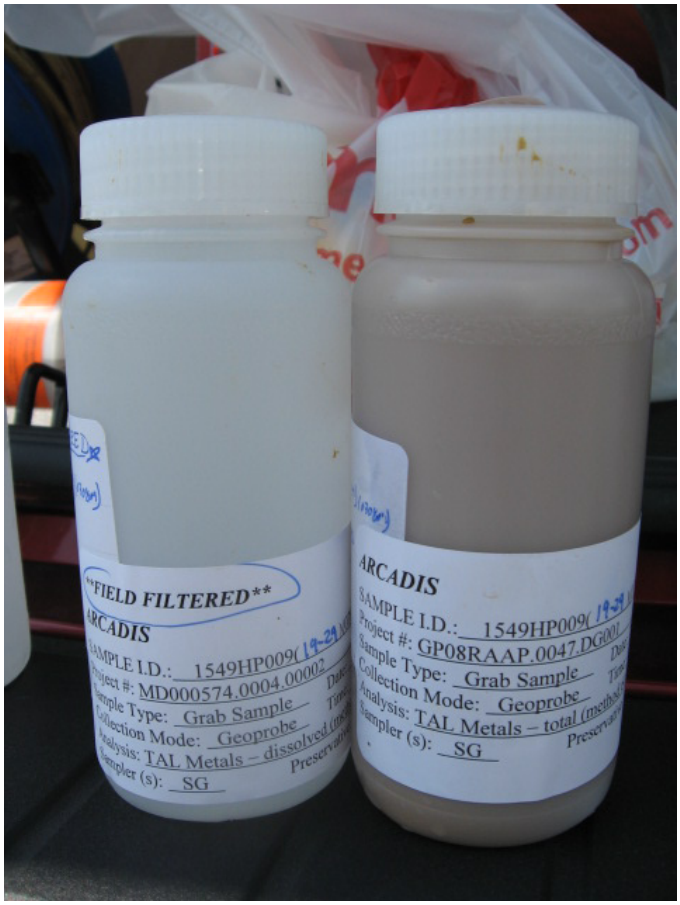
COMMENTS _____

SIGNATURE _____

1549-9 (19-29) (070809)

2 bottles submitted

(one filtered / one unfiltered)



Sample ID – 1549-9

1041-20

EXAMPLE MAP FILE AND PURGING LOGBOOK FORM 10.2-d
GROUNDWATER SAMPLES

WELL COORD. OR ID 1041-20 SAMPLE NO. _____
WELL/SITE DESCRIPTION _____

X-COORD. _____ Y-COORD. _____ ELEV. _____ UNITS
DATE 07 / 08 / 09 TIME 12:00 AIR TEMP.

WELL DEPTH 30 FT. ~~5~~ IN. CASING HT. ~~____ FT. ____ IN.~~ screen set
WATER DEPTH ~15 FT. ~~____ IN.~~ WELL DIAMETER _____ IN. 25-30 bags
WATER COLUMN HEIGHT _____ FT. _____ IN. SANDPACK DIAM. _____ IN.
EQUIVALENT VOLUME OF STANDING WATER _____ (GAL) (L)
VOLUME OF BAILER _____ (GAL) (L) or PUMP RATE _____ (GPM) (LPM)
TOTAL NO. OF BAILERS (5 EV) _____ or PUMP TIME _____ MIN.
WELL WENT DRY? [Yes] [No] NUM. OF BAILERS _____ or PUMP TIME
VOL. REMOVED _____ (GAL) (L) RECOVERY TIME
PURGE AGAIN? [Yes] [No] TOTAL VOL. REMOVED _____ (GAL) (L)

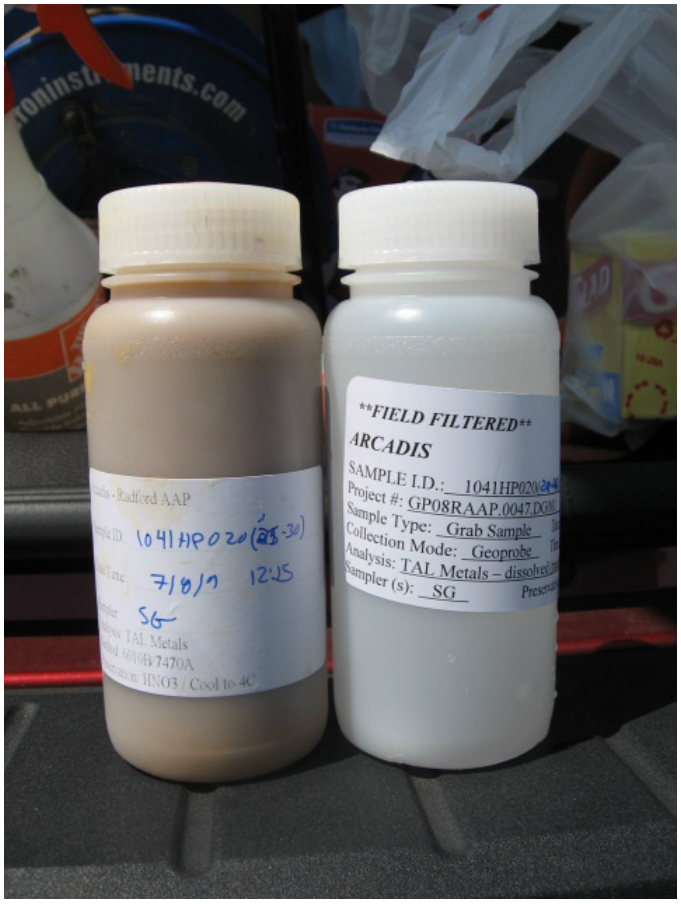
DATE & TIME	QUANTITY REMOVED	TIME REQ'D	pH	Cond	Temp	ORD	Turb	DO	Character of water (color / clarity / odor / partic.)
(before) 12:00							>1100		
(during)									brown cloudy
(during)									
(during									
(after)									

* COMMENTS filtered sample looks ~~turbid~~ - possible break through in sample (see picture)
SIGNATURE _____

1041-20(25-30)(070809)
↳ 2 bottles collected (filtered / unfiltered)
~~Duplicate collected~~



Sample ID - 1041-20



Sample ID - 1041-20

1041-21

EXAMPLE MAP FILE AND PURGING LOGBOOK FORM 10.2-d
~~GROUNDWATER~~ SAMPLES

WELL COORD. OR ID 1041-21 SAMPLE NO. _____
WELL/SITE DESCRIPTION _____

X-COORD. _____ Y-COORD. _____ ELEV. _____ UNITS
DATE ___/___/___ TIME 13:00 AIR TEMP.

WELL DEPTH 26 FT. ~~bls~~ ~~IN.~~ ~~CASING HT.~~ ___ ~~FT.~~ ___ ~~IN.~~
WATER DEPTH ~24 FT. ___ IN. WELL DIAMETER _____ IN.
WATER COLUMN HEIGHT _____ FT. _____ IN. SANDPACK DIAM. _____ IN.
EQUIVALENT VOLUME OF STANDING WATER _____ (GAL) (L)
VOLUME OF BAILER _____ (GAL) (L) or PUMP RATE _____ (GPM) (LPM)
TOTAL NO. OF BAILERS (5 EV) _____ or PUMP TIME _____ MIN.
WELL WENT DRY? [Yes] [No] NUM. OF BAILERS _____ or PUMP TIME
VOL. REMOVED _____ (GAL) (L) RECOVERY TIME
PURGE AGAIN? [Yes] [No] TOTAL VOL. REMOVED _____ (GAL) (L)

screened 21 - 26 ftbgs

DATE & TIME	QUANTITY REMOVED	TIME REQ'D	pH	Cond	Temp	ORD	Turb	DO	Character of water (color / clarity / odor / partic.)
(before) 13:00	—	—	—	—	—	—	>1100	—	brown cloudy
(during)									
(during)									
(during									
(after)									

COMMENTS _____
SIGNATURE _____

1041-21 (21-26) (070809)
→ 2 bottles (1 unfiltered, 1 filtered)
→ ★DUP02★ collected



Sample ID – 1041-21

Appendix D

Laboratory Data and Validation Reports

ARCADIS

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 001

Analytical data was evaluated in accordance with applicable USEPA SW-846 method requirements, "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999), "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (July 2002), "USEPA Region III National Functional Guidelines for Organic Data Review" (September 1994), "USEPA Region III National Functional Guidelines for Inorganic Data Review" (June 1995), site-specific requirements defined in *Radford Master Work Plan* (URS, 2003), and site-specific requirements defined in the *Quality Assurance Plan Addendum* (Arcadis, 2008). The validation presented in this review was performed at the RAAP defined Level I.

The data review summarized in this report includes a review of all sample collection documentation and the electronic data validation of the analytical data housed in the project database. Sample collection documentation included sample collection logs and chains of custody. The electronic data validation was performed utilizing the EQuIS Data Qualification Module (DQM). DQM checks for the following parameters:

- Holding times and preservation;
- Blank contamination;
  - Method blanks,
  - Trip blanks,
  - Equipment blanks;
- Matrix spike and Duplicate sample recovery;
- Matrix Spike and Matrix Spike Duplicate relative percent differences;
- Laboratory Control Sample and Duplicate recovery;
- Laboratory Control Sample and Duplicate relative percent differences;
- Surrogate recovery (organic analyses only); and
- Field duplicate relative percent difference.

Manually review was performed on the following items:

- Sample dilutions and reporting limits;
- Case Narratives; and
- Total versus dissolved metals concentrations.

Reviewed data was generated by Empirical Laboratories. Data qualifiers were applied electronically to the database with any additional qualifiers added manually. A summary of the data as amended by data qualifiers is included with the original hard copy reports. The attached table summarizes the data that were qualified due to QC deficiencies. The table indicates compounds/analytes qualified based on electronic and manual validation. Refer to the associated method section of the validation checklist for a detailed explanation of qualification. All other data in this SDG are considered usable as reported.

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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 001

The following list of data qualifiers and definitions were applied in accordance with qualification criteria defined in the above guidance documents:

UB Compound/analyte detected in blank or associated blank, qualified as a non-detect at listed value.

J The analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reporting limit; however, the reported quantitation limit is approximate and may, or may not represent the actual limit of quantitation necessary to accurately and precisely measure analyte in the sample.

R The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria; and the presence or absence of the analyte cannot be verified.

DQM RUN BY:	Rachelle Borne	06/20/08
REVIEW PERFORMED BY:	Rachelle Borne	06/23/08
SIGNATURE:	Jane Kennedy for RB	
PEER REVIEW:	Jane Kennedy	06/24/08

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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 001

The following samples were included in this SDG:

sample delivery group	sys sample code	sample date	parent sample
RADFORD001	10341SB002 (1-2)	5/8/2008	
RADFORD001	1034SB001 (0.5-1.5)	5/8/2008	
RADFORD001	1034SB001 (7-8)	5/8/2008	
RADFORD001	1034SB004 (0.5-1.5)	5/8/2008	
RADFORD001	1034SB004 (5-6)	5/8/2008	
RADFORD001	1034SB008 (0.5-1.5)	5/8/2008	
RADFORD001	1034SB008 (4-5)	5/8/2008	
RADFORD001	1041HP002 (05062008)	5/8/2008	
RADFORD001	1041SB002 (7-8)	5/8/2008	
RADFORD001	1041SB004 (0-1)	5/8/2008	
RADFORD001	1041SB004 (7-8)	5/8/2008	
RADFORD001	1549DUP002(0.5-1.5)	5/7/2008	1549SB003(0.5-1.5)
RADFORD001	1549SB001(0.5-1.5)	5/7/2008	
RADFORD001	1549SB001(7-8)	5/7/2008	
RADFORD001	1549SB003(0.5-1.5)	5/7/2008	
RADFORD001	1549SB003(5-6)	5/7/2008	
RADFORD001	1549SB004(0.5-1.5)	5/7/2008	
RADFORD001	1549SB004(5-6)	5/7/2008	
RADFORD001	1549SB006(0.5-1.5)	5/7/2008	
RADFORD001	1549SB006(5-6)	5/7/2008	
RADFORD001	5DITCHHP003(05062008)	5/6/2008	
RADFORD001	5DITCHHP004(05062008)	5/6/2008	
RADFORD001	5DITCHP001(05062008)	5/6/2008	
RADFORD001	5DITCHP002(05062008)	5/6/2008	
RADFORD001	5DITCHSB003(11-12)	5/6/2008	
RADFORD001	5DITCHSB004(11-12)	5/6/2008	
RADFORD001	5DUP001(05062008)	5/6/2008	5DITCHHP003(05062008)
RADFORD001	TB-1(05062008)	5/6/2008	
RADFORD001	TB2(05072008-01)	5/7/2008	
RADFORD001	TB3 (05062008-01)	5/8/2008	

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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 001

DATA PACKAGE DOCUMENTATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Sample depth for water		X		X	
6. Collection technique (bailer, pump, etc.)		X		X	
7. Sample container type		X		X	
8. Preservation methods		X		X	
9. Chain-of-custody form completed		X		X	
10. Required analytical methods requested		X		X	
11. Field (water and soil) sample logs completed properly		X		X	
12. Number and type of field QC samples collected (blanks, replicates, splits, etc.)		X		X	
13. Sample shipping		X		X	
14. Laboratory task order		X		X	

Field sampling logs = water and/or soil/sediment sampling logs QC - quality control

Comments:

All field documentation (Water Sampling Logs, Field Instrument Calibration, and Daily Logs) were reviewed for the above referenced sampling event.

Note: Several samples on the COCs were placed on hold. Subsequent analyses were reported in this SDG or in Radford 003.

The lab was instructed by ARCADIS to discard samples 5DITCHB002(13-14) and 5DITCHSB001(11-12). No analyses were performed on these two samples.

ARCADIS

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 001

VOLATILE ORGANIC COMPOUNDS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks A. Method blanks		DQM		DQM
B. Equipment blanks	NA		NA	
C. Trip blanks		DQM		DQM
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS) A. LCS %R		DQM		DQM
B. LCS duplicate (LCSD) %R		DQM	DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS) A. MS %R	NA		NA	
B. MS duplicate (MSD) %R	NA		NA	
C. MS/MSD precision (RPD)	NA		NA	
7. Field Duplicate precision (RPD)	DQM		DQM	

M -- Manual Review %R - percent recovery RPD - relative percent difference DQM -- Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8260.

Note: The "Y" flag was used by the laboratory to indicate that the %D for the analyte exceeded the control limit in the CCV with a negative bias. The "Y" value was changed to a "J" in this validation to indicate that it is an estimated value. See the attached qualification summary for details of the qualifications.

2. There were no dilutions required.

3A. Methylene chloride was detected in the method blank for batches 0508, 0509, and 0514. The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank values.

Chloromethane, methylene chloride, and toluene were detected in the method blank for batch 0520. The associated field samples were non-detect for toluene. No qualification is necessary. The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank value for methylene chloride and less than five times the blank value for chloromethane.

Chloromethane and methylene chloride were detected in the method blank for batch 0520E. The associated field samples were non-detect for chloromethane. No qualification is necessary. The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank value for methylene chloride.

3C. Methylene chloride was detected in TB-1(05062008), TB-2(05072008) and TB-3(05062008). The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank values.

5. The recovery of chloromethane was above the control limit in the LCS and the LCSD for batch 0508. The recoveries of 2-butanone and dichlorodifluoromethane were above the control limit in the LCSD. The associated field samples were non-detect for these compounds. No qualification is necessary.

The recovery of 2-butanone was above the control limit in the LCSs for batches 0509, 0520, and 0520E. All detections of 2-butanone in the associated field samples are qualified as estimated.

The recovery of chloromethane was above the control limit in the LCSD for batch 0514. The associated field samples were non-detect for this compound. No qualification is necessary.

6. Site-specific MS/MSD analyses were not included in the data package. Method control was established with the LCS/LCSD analyses.

7. 1549DUP002(0.5-1.5) was collected as a field duplicate of 1549SB003(0.5-1.5). The RPDs were acceptable.

5DUP001(0506200) was collected as a field duplicate of 5DITCHHP003(05062008). The RPDs were acceptable.

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SEMI-VOLATILE ORGANIC COMPOUNDS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks A. Method blanks		DQM		DQN
B. Equipment blanks	NA		NA	
4. Surrogate spike recoveries		DQM		DQM
5. Laboratory control sample (LCS) A. LCS %R		DQM		DQM
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
6. Matrix spike (MS) A. MS %R		DQM		DQM
B. MS duplicate (MSD) %R		DQM		DQM
C. MS/MSD precision (RPD)	DQM		DQM	
7. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8270.

Note: The "Y" flag was used by the laboratory to indicate that the %D for the analyte exceeded the control limit in the CCV with a negative bias. The "Y" value was changed to a "J" during this validation to indicate that it is an estimated value. See the attached qualification summary for details of the qualifications.

The "X" flag was used by the laboratory to indicate that the %D for the analyte exceeded the control limit in the ICV with a positive bias. The "X" value was changed to a "J" during this validation to indicate that it is an estimated value. See the attached qualification summary for details of the qualifications.

The case narrative indicated that the internal area standard counts for d12-perylene were less than 50% in the 1x dilution of 1034SB008(0.5-1.5) due to matrix interference. The sample was analyzed at a 10x dilution. The internal standard counts were acceptable in the dilution analysis and the results were comparable. The dilution will be reported. No qualification is necessary. There are elevated reporting limits for non-detect results.

3A. Caprolactam was detected in the method blank for batch 512BW1. The associated sample was qualified as non-detect because the sample concentration was less than five times the blank value.

4. Four surrogate recoveries were below the control limit in 1549DUP002(0.5-1.5). All results are qualified as estimated.

5A. The recoveries of atrazine and 1,2,4,5-tetrachlorobenzene were below the control limit in the LCS for batch 5012BS1. The associated field samples are qualified as estimated for these compounds.

The recovery of benzaldehyde was below the control limit in the LCS for batch 5012BS1 and the recovery was less than 10%. The associated field samples are qualified as rejected for this compound.

The recovery of caprolactam was below the control limit in the LCS for batch 5012BW1. The associated field sample is qualified as estimated for this compound.

The recovery of 2,4-dinitrophenol was above the control limit in the LCS for batch 5012BW1. The associated field sample was non-detect for this compound. No qualification is necessary.

6. 1549SB003(0.5-1.5) was utilized as a site-specific MS/MSD. The recoveries of atrazine, benzaldehyde, chrysene, and 1,2,4,5-tetrachlorobenzene were below the control limit in the MS and/or MSD. The parent sample only is qualified as estimated for these compounds based on professional judgment.

7. 1549DUP002(0.5-1.5) was collected as a field duplicate of 1549SB003(0.5-1.5). The RPDs were acceptable.

5DUP001(0506200) was collected as a field duplicate of 5DITCHHP003(05062008). The RPDs were acceptable.

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EXPLOSIVES

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	NA		NA	
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	DQM		DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS)				
A. MS %R	NA		NA	
B. MS duplicate (MSD) %R	NA		NA	
C. MS/MSD precision (RPD)	NA		NA	
7. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8330.

2. No dilutions were required.

4. The surrogate recovery was above the control limit on the confirmation column for 1549SB001(0.5-1.5). The results were reported from the primary column. No qualification is necessary.

6. Site-specific MS/MSD analyses were not included in this data package. Method control was established with the LCS/LCSD analyses.

7. 1549DUP002(0.5-1.5) was collected as a field duplicate of 1549SB003(0.5-1.5). The RPDs were acceptable.

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POLYCHLORINATED BIPHENYLS (PCBs)

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	NA		NA	
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	DQM		DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS)				
A. MS %R	DQM		DQM	
B. MS duplicate (MSD) %R	DQM		DQM	
C. MS/MSD precision (RPD)	DQM		DQM	
7. Field Duplicate precision (RPD)		DQM		DQM

DQM – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8082.

Note: The case narrative noted that PCB-1254 exceeded the 20% D with a negative bias in several CCVs for the confirmation column. All associated field sample results were either non-detect, less than the quantitation limit, or reported from the primary column. No qualification is necessary.

The case narrative noted that PCB-1260 exceeded the 20% D with a positive bias on the confirmation and primary columns for the CCV analyzed on 05/18/08 @ 0643. The associated field samples were non-detect for this compound. No qualification is necessary.

2. No dilutions were required.

4. One surrogate recovery was above the control limit on the confirmation column for the LCS. No qualification is necessary since this is a laboratory QC sample and the surrogate recovery was acceptable on the primary column.

One surrogate recovery was above the control limit on the primary column for 1041HP002(05062008). The results were reported from the confirmation column. No qualification is necessary.

6. 1034SB008(0.5-1.5) was utilized as a site-specific MS/MSD. The recoveries and RPDs were acceptable.

7. 1549DUP002(0.5-1.5) was collected as a field duplicate of 1549SB003(0.5-1.5). The RPDs for PCB 1254 and PCB 1260 were above the control limit (40%). The parent and the duplicate only are qualified as estimated for these compounds based on professional judgment.

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METALS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	DQM		DQM	
4. Serial Dilution	M		M	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
6. Matrix spike				
A. Matrix spike (MS) %R		DQM		DQM
B. Matrix spike duplicate (MSD) %R		DQM		DQM
C. MS/MSD precision (RPD)		DQM		DQM
7. Field Duplicate precision (RPD)		DQM		DQM

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed utilizing Method 6010B

Note: Metals detected between the MDL and RL were flagged with a "B" by the laboratory. The "B" was changed in this validation to a "J" to indicate that this is an estimated value.

6. 1034SB008(0.5-1.5) was utilized as a site-specific MS/MSD. The sample concentration for aluminum, calcium and iron were greater than four times the spike value. No qualification is necessary. The recoveries of antimony, magnesium, manganese, and mercury were below the control limit in the MS and/or MSD. The recovery of silver was above the control limit in the MS. The recovery of manganese was above the control limit in the MSD. The RPDs for calcium, magnesium, manganese, mercury and silver were above the control limit. All samples in the analytical batch are qualified as estimated for antimony, calcium, magnesium, manganese, and mercury based on professional judgment.

7. 1549DUP002(0.5-1.5) was collected as a field duplicate of 1549SB003(0.5-1.5). The RPDs for magnesium, manganese, sodium, cobalt, calcium and mercury were above the control limit. The parent and the duplicate are qualified as estimated for these compounds based on professional judgment.

Radford 001
Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	10341SB002 (1-2)	SW6010B	MANGANESE	276	mg/kg	J	Spike Recovery	1
RADFORD001	10341SB002 (1-2)	SW6010B	ANTIMONY	<3.9	mg/kg	UJ	Spike Recovery	1
RADFORD001	10341SB002 (1-2)	SW6010B	CALCIUM METAL	6490	mg/kg	J	Spike Recovery	1
RADFORD001	10341SB002 (1-2)	SW6010B	MAGNESIUM	3450	mg/kg	J	Spike Recovery	1
RADFORD001	10341SB002 (1-2)	SW7471A	MERCURY	0.13	mg/kg	J	Spike Recovery	1
RADFORD001	10341SB002 (1-2)	SW8260B	1,4-Dioxane	<53	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	10341SB002 (1-2)	SW8260B	DICHLOROMETHANE	9.8	ug/kg	UB	Blank Contamination	1
RADFORD001	10341SB002 (1-2)	SW8270C	BENZALDEHYDE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	10341SB002 (1-2)	SW8270C	ATRAZINE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	10341SB002 (1-2)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<430	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	10341SB002 (1-2)	SW8270C	3,3'-DICHLOROBENZIDINE	<430	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	10341SB002 (1-2)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW6010B	MANGANESE	214	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW6010B	ANTIMONY	<3.8	mg/kg	UJ	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW6010B	MAGNESIUM	2100	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW6010B	CALCIUM METAL	2440	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW7471A	MERCURY	0.045	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW8260B	1,4-Dioxane	<56	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB001 (0.5-1.5)	SW8260B	DICHLOROMETHANE	12	ug/kg	UB	Blank Contamination	1
RADFORD001	1034SB001 (0.5-1.5)	SW8270C	BENZALDEHYDE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW8270C	ATRAZINE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1034SB001 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<420	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB001 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<420	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB001 (0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1034SB001 (7-8)	SW8260B	1,4-Dioxane	<61	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB001 (7-8)	SW8260B	CHLOROMETHANE	0.61	ug/kg	UB	Blank Contamination	1
RADFORD001	1034SB001 (7-8)	SW8260B	DICHLOROMETHANE	11	ug/kg	UB	Blank Contamination	1
RADFORD001	1034SB004 (0.5-1.5)	SW6010B	ANTIMONY	<5.3	mg/kg	UJ	Spike Recovery	1
RADFORD001	1034SB004 (0.5-1.5)	SW6010B	CALCIUM METAL	2820	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB004 (0.5-1.5)	SW6010B	MANGANESE	108	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB004 (0.5-1.5)	SW6010B	MAGNESIUM	2750	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB004 (0.5-1.5)	SW7471A	MERCURY	0.49	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB004 (0.5-1.5)	SW8260B	1,4-Dioxane	<86	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1

Radford 001
Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	1034SB004 (0.5-1.5)	SW8260B	DICHLOROMETHANE	14	ug/kg	UB	Blank Contamination	1
RADFORD001	1034SB004 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<580	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB004 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<580	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB004 (0.5-1.5)	SW8270C	ATRAZINE	<580	ug/kg	UJ	Spike Recovery	1
RADFORD001	1034SB004 (0.5-1.5)	SW8270C	BENZALDEHYDE	<580	ug/kg	UJ	Spike Recovery	1
RADFORD001	1034SB004 (0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<580	ug/kg	UJ	Spike Recovery	1
RADFORD001	1034SB004 (5-6)	SW8260B	1,4-Dioxane	<82	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB004 (5-6)	SW8260B	DICHLOROMETHANE	13	ug/kg	UB	Blank Contamination	1
RADFORD001	1034SB008 (0.5-1.5)	SW6010B	CALCIUM METAL	6100	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB008 (0.5-1.5)	SW6010B	MAGNESIUM	4300	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB008 (0.5-1.5)	SW6010B	MANGANESE	329	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB008 (0.5-1.5)	SW6010B	ANTIMONY	<3.6	mg/kg	UJ	Spike Recovery	1
RADFORD001	1034SB008 (0.5-1.5)	SW7471A	MERCURY	0.35	mg/kg	J	Spike Recovery	1
RADFORD001	1034SB008 (0.5-1.5)	SW8260B	1,4-Dioxane	<64	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB008 (0.5-1.5)	SW8260B	DICHLOROMETHANE	11	ug/kg	UB	Blank Contamination	1
RADFORD001	1034SB008 (0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<4000	ug/kg	UJ	Spike Recovery	10
RADFORD001	1034SB008 (0.5-1.5)	SW8270C	BENZALDEHYDE	<4000	ug/kg	UJ	Spike Recovery	10
RADFORD001	1034SB008 (0.5-1.5)	SW8270C	ATRAZINE	<4000	ug/kg	UJ	Spike Recovery	10
RADFORD001	1034SB008 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<4000	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	10
RADFORD001	1034SB008 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<4000	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	10
RADFORD001	1034SB008 (4-5)	SW8260B	1,4-Dioxane	<52	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1034SB008 (4-5)	SW8260B	DICHLOROMETHANE	6.4	ug/kg	UB	Blank Contamination	1
RADFORD001	1041HP002 (05062008)	SW8260B	BROMOMETHANE	<1.0	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041HP002 (05062008)	SW8260B	DICHLOROMETHANE	0.31	ug/l	UB	Blank Contamination	1
RADFORD001	1041HP002 (05062008)	SW8270C	BENZALDEHYDE	<5.6	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041HP002 (05062008)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<5.6	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041HP002 (05062008)	SW8270C	3,3'-DICHLOROBENZIDINE	<5.6	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041HP002 (05062008)	SW8270C	CARBAZOLE	<5.6	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041HP002 (05062008)	SW8270C	ATRAZINE	<5.6	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041HP002 (05062008)	SW8270C	CAPROLACTAM	1.7	ug/l	UB	Blank Contamination	1
RADFORD001	1041HP002 (05062008)	SW8270C	Indeno(1,2,3-cd)pyrene	<5.6	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1

Radford 001
Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	1041SB002 (7-8)	SW8260B	1,4-Dioxane	<54	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041SB002 (7-8)	SW8260B	DICHLOROMETHANE	6.5	ug/kg	UB	Blank Contamination	1
RADFORD001	1041SB004 (0-1)	SW6010B	MAGNESIUM	1480	mg/kg	J	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW6010B	MANGANESE	715	mg/kg	J	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW6010B	ANTIMONY	<3.9	mg/kg	UJ	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW6010B	CALCIUM METAL	1420	mg/kg	J	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW7471A	MERCURY	0.27	mg/kg	J	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW8260B	1,4-Dioxane	<66	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041SB004 (0-1)	SW8260B	DICHLOROMETHANE	6.1	ug/kg	UB	Blank Contamination	1
RADFORD001	1041SB004 (0-1)	SW8270C	BENZALDEHYDE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW8270C	3,3'-DICHLOROBENZIDINE	<430	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041SB004 (0-1)	SW8270C	ATRAZINE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1041SB004 (0-1)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<430	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1041SB004 (7-8)	SW8260B	CHLOROMETHANE	0.66	ug/kg	UB	Blank Contamination	1
RADFORD001	1041SB004 (7-8)	SW8260B	DICHLOROMETHANE	14	ug/kg	UB	Blank Contamination	1
RADFORD001	1041SB004 (7-8)	SW8260B	1,4-Dioxane	<78	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549DUP002(0.5-1.5)	SW6010B	MAGNESIUM	1180	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW6010B	MANGANESE	143	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW6010B	SODIUM	275	mg/kg	J	Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW6010B	ANTIMONY	<3.8	mg/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW6010B	COBALT	3.4	mg/kg	J	Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW6010B	CALCIUM METAL	1140	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW7471A	MERCURY	0.13	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW8082	PCB-1260	160	ug/kg	J	Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW8082	PCB-1254	95	ug/kg	J	Duplicate RPD	1
RADFORD001	1549DUP002(0.5-1.5)	SW8260B	DICHLOROMETHANE	6.1	ug/kg	UB	Blank Contamination	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	bis(2-Chloroethyl)ether	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	FLUORANTHENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Benzo(g,h,i)perylene	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	ATRAZINE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	DIBENZOFURAN	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	DIMETHYL PHTHALATE	<420	ug/kg	UJ	Spike Recovery	1

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Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	PYRENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2,4-DINITROTOLUENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2,4-DICHLOROPHENOL	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	ANTHRACENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	HEXACHLOROBENZENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Di-n-octylphthalate	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	bis(2-Chloroethoxy)methane	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	PHENOL	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	bis(2-Chloroisopropyl)ether	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	P-CHLOROANILINE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	4-Methylphenol	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2,4-DIMETHYLPHENOL	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	CAPROLACTAM	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	4-BROMOPHENYL PHENYL ETHER	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	BENZALDEHYDE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	4-NITROPHENOL	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	P-NITROANILINE	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Benzo(b)fluoranthene	<170	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Bis(2-ethylhexyl)phthalate	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	1,1'-Biphenyl	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	FLUORENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	CARBAZOLE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	HEXACHLORO-1,3-BUTADIENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	PENTACHLOROPHENOL	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2,4,6-Trichlorophenol	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2-NITROANILINE	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	NAPHTHALENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	N-NITROSODIPHENYLAMINE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<420	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2-NITROPHENOL	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2-Methylphenol	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2-CHLOROPHENOL	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2,4,5-TRICHLOROPHENOL	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	ACETOPHENONE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	NITROBENZENE	<420	ug/kg	UJ	Spike Recovery	1

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SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	3-NITROANILINE	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Indeno(1,2,3-cd)pyrene	<170	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2-CHLORONAPHTHALENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Benzo(a)pyrene	<170	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Benzo(k)fluoranthene	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2-METHYLNAPHTHALENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	1,2-BENZPHENANTHRACENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	BENZYL BUTYL PHTHALATE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2,4-DINITROPHENOL	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	4,6-Dinitro-2-methylphenol	<1700	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Dibenz(a,h)anthracene	<170	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Benzo(a)anthracene	<170	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	4-Chloro-3-methylphenol	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	2,6-DINITROTOLUENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Di-n-butylphthalate	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	HEXACHLOROETHANE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	ACENAPHTHYLENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	4-CHLOROPHENYL PHENYL ETHER	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<420	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	3,5,5-TRIMETHYL-2-CYCLOHEXENE-1-ONE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	Acenaphthene	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	DIETHYL PHTHALATE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549DUP002(0.5-1.5)	SW8270C	N-Nitroso-di-n-propylamine	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW6010B	ANTIMONY	<3.9	mg/kg	UJ	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW6010B	CALCIUM METAL	3550	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW6010B	MANGANESE	258	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW6010B	MAGNESIUM	5690	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW7471A	MERCURY	0.08	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW8260B	DICHLOROMETHANE	7.1	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB001(0.5-1.5)	SW8270C	BENZALDEHYDE	<440	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW8270C	ATRAZINE	<440	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB001(0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<440	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB001(0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<440	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB001(0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<440	ug/kg	UJ	Spike Recovery	1

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Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	1549SB001(7-8)	SW8260B	1,4-Dioxane	<6.1	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB001(7-8)	SW8260B	DICHLOROMETHANE	7.6	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB003(0.5-1.5)	SW6010B	COBALT	8.4	mg/kg	J	Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW6010B	ANTIMONY	<3.8	mg/kg	UJ	Spike Recovery	1
RADFORD001	1549SB003(0.5-1.5)	SW6010B	CALCIUM METAL	6620	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW6010B	MANGANESE	347	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW6010B	MAGNESIUM	6480	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW6010B	SODIUM		mg/kg	UJ	Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW7471A	MERCURY	0.061	mg/kg	J	Spike Recovery and Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW8082	PCB-1260	<22	ug/kg	UJ	Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW8082	PCB-1254	<22	ug/kg	UJ	Duplicate RPD	1
RADFORD001	1549SB003(0.5-1.5)	SW8260B	DICHLOROMETHANE	6.3	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB003(0.5-1.5)	SW8260B	2-Butanone	5.3	ug/kg	J	Spike Recovery	1
RADFORD001	1549SB003(0.5-1.5)	SW8270C	BENZALDEHYDE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB003(0.5-1.5)	SW8270C	ATRAZINE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB003(0.5-1.5)	SW8270C	1,2-BENZPHENANTHRACENE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB003(0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<430	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB003(0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<430	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB003(0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB003(5-6)	SW8260B	1,4-Dioxane	<49	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB003(5-6)	SW8260B	DICHLOROMETHANE	5	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB003(5-6)	SW8260B	2-Butanone	10	ug/kg	J	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW6010B	MAGNESIUM	2160	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW6010B	MANGANESE	457	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW6010B	ANTIMONY	<3.5	mg/kg	UJ	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW6010B	CALCIUM METAL	3280	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW7471A	MERCURY	0.063	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW8260B	DICHLOROMETHANE	4.6	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB004(0.5-1.5)	SW8270C	BENZALDEHYDE	<400	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW8270C	ATRAZINE	<400	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB004(0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<400	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB004(0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<400	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB004(0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<400	ug/kg	UJ	Spike Recovery	1

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SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	1549SB004(5-6)	SW8260B	DICHLOROMETHANE	10	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB004(5-6)	SW8260B	2-Butanone	36	ug/kg	J	Spike Recovery	1
RADFORD001	1549SB004(5-6)	SW8260B	1,4-Dioxane	<57	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB006(0.5-1.5)	SW6010B	MAGNESIUM	8230	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW6010B	MANGANESE	154	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW6010B	ANTIMONY	<3.7	mg/kg	UJ	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW6010B	CALCIUM METAL	9460	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW7471A	MERCURY	0.041	mg/kg	J	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW8260B	DICHLOROMETHANE	4.8	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB006(0.5-1.5)	SW8260B	2-Butanone	3.6	ug/kg	J	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW8270C	ATRAZINE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<420	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB006(0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<420	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	1549SB006(0.5-1.5)	SW8270C	1,2,4,5-TETRACHLOROBENZENE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB006(0.5-1.5)	SW8270C	BENZALDEHYDE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD001	1549SB006(5-6)	SW8260B	DICHLOROMETHANE	9.4	ug/kg	UB	Blank Contamination	1
RADFORD001	1549SB006(5-6)	SW8260B	2-Butanone	5.3	ug/kg	J	Spike Recovery	1
RADFORD001	1549SB006(5-6)	SW8260B	1,4-Dioxane	<52	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	5DITCHHP003(05062008)	SW8260B	1,4-Dioxane	<5	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	5DITCHHP004(05062008)	SW8260B	1,4-Dioxane	<5	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	5DITCHP001(05062008)	SW8260B	1,4-Dioxane	<5	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	5DITCHP002(05062008)	SW8260B	1,4-Dioxane	<5	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	5DITCHSB003(11-12)	SW8260B	1,4-Dioxane	<54	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	5DITCHSB003(11-12)	SW8260B	CHLOROMETHANE	0.52	ug/kg	UB	Blank Contamination	1
RADFORD001	5DITCHSB003(11-12)	SW8260B	DICHLOROMETHANE	17	ug/kg	UB	Blank Contamination	1
RADFORD001	5DITCHSB004(11-12)	SW8260B	1,4-Dioxane	<53	ug/kg	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	5DITCHSB004(11-12)	SW8260B	DICHLOROMETHANE	12	ug/kg	UB	Blank Contamination	1

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SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason for Qualification	Dilution
RADFORD001	5DUP001(05062008)	SW8260B	1,4-Dioxane	<5.0	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	TB-1(05062008)	SW8260B	1,4-Dioxane	<5.0	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	TB2(05072008-01)	SW8260B	1,4-Dioxane	<5.0	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1
RADFORD001	TB3 (05062008-01)	SW8260B	BROMOMETHANE	<1.0	ug/l	UJ	Exceeded %D in the CCV with a negative bias	1

ARCADIS

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 002

Analytical data was evaluated in accordance with applicable USEPA SW-846 method requirements, "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999), "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (July 2002), "USEPA Region III National Functional Guidelines for Organic Data Review" (September 1994), "USEPA Region III National Functional Guidelines for Inorganic Data Review" (June 1995), site-specific requirements defined in *Radford Master Work Plan* (URS, 2003), and site-specific requirements defined in the *Quality Assurance Plan Addendum* (Arcadis, 2008). The validation presented in this review was performed at the RAAP defined Level II and ten percent of the samples were reviewed at a Level IV.

The data review summarized in this report includes a review of all sample collection documentation and the electronic data validation of the analytical data housed in the project database. Sample collection documentation included sample collection logs and chains of custody. The electronic data validation was performed utilizing the EQuIS Data Qualification Module (DQM). DQM checks for the following parameters:

- Holding times and preservation;
- Blank contamination;
  - Method blanks,
  - Trip blanks,
  - Equipment blanks;
- Matrix spike and Duplicate sample recovery;
- Matrix Spike and Matrix Spike Duplicate relative percent differences;
- Laboratory Control Sample and Duplicate recovery;
- Laboratory Control Sample and Duplicate relative percent differences;
- Surrogate recovery (organic analyses only); and
- Field duplicate relative percent difference.

Manually review was performed on the following items:

- Sample dilutions and reporting limits;
- Case Narratives; and
- Total versus dissolved metals concentrations.
- Initial and continuing calibrations
- Instrument Tunes
- Compound identification and quantitation
- Internal standards
- Raw data calculations

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Reviewed data was generated by Empirical Laboratories. Data qualifiers were applied electronically to the database with any additional qualifiers added manually. A summary of the data as amended by data qualifiers is included with the original hard copy reports. The attached table summarizes the data that were qualified due to QC deficiencies. The table indicates compounds/analytes qualified based on electronic and manual validation. Refer to the associated method section of the validation checklist for a detailed explanation of qualification. All other data in this SDG are considered usable as reported.

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The following list of data qualifiers and definitions were applied in accordance with qualification criteria defined in the above guidance documents:

UB Compound/analyte detected in blank or associated blank, qualified as a non-detect at listed value.

J The analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reporting limit; however, the reported quantitation limit is approximate and may, or may not represent the actual limit of quantitation necessary to accurately and precisely measure analyte in the sample.

R The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria; and the presence or absence of the analyte cannot be verified.

DQM RUN BY:	Rachelle Borne	06/20/08
REVIEW PERFORMED BY:	Rachelle Borne	07/09/08
SIGNATURE:	for RB	
PEER REVIEW:	Jane Kennedy	07/09/08

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The following samples were included in this SDG:

sample delivery group	sys sample code	sample date	parent sample
RADFORD002	1034DUP01 (0.5-1.5)	5/9/2008	1034SB006 (0.5-1.5)
RADFORD002	1034SB006 (0.5-1.5)	5/9/2008	
RADFORD002	1034SB006 (7-8)	5/9/2008	
RADFORD002	1034SB007 (0.5-1.5)	5/9/2008	
RADFORD002	1034SB007 (7-8)	5/9/2008	
RADFORD002	1041HP001 (05092008)	5/9/2008	
RADFORD002	1041HP003 (05092008)	5/9/2008	
RADFORD002	1041HP004 (050908)	5/9/2008	
RADFORD002	1041SB001 (0.5-1.5)	5/9/2008	
RADFORD002	1041SB001 (7-8)	5/9/2008	
RADFORD002	1041SB003 (0.5-1.5)	5/9/2008	
RADFORD002	1041SB003 (7-8)	5/9/2008	
RADFORD002	1549 HP008 (05102008)	5/10/2008	
RADFORD002	5GP-HP021 (05102008)	5/10/2008	
RADFORD002	5GP-HP025 (05102008)	5/10/2008	
RADFORD002	5GP-HP026 (05102008)	5/10/2008	
RADFORD002	EB001 (05102008)	5/10/2008	
RADFORD002	SSB-021 (23-24)	5/9/2008	
RADFORD002	SSB-025 (19-20)	5/9/2008	
RADFORD002	SSB-026 (19-20)	5/9/2008	
RADFORD002	TB-4 (050908-01)	5/9/2008	
RADFORD002	TB-4 (05102008-01)	5/10/2008	

The following samples were included in the Level IV validation:

1034SB006 (0.5-1.5)	1041HP001 (05092008)
1034SB007 (0.5-1.5)	1041HP003 (05092008)
1041SB001 (0.5-1.5)	1041HP004 (050908)
1041SB003 (0.5-1.5)	

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DATA PACKAGE DOCUMENTATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Sample depth for water		X		X	
6. Collection technique (bailer, pump, etc.)		X		X	
7. Sample container type		X		X	
8. Preservation methods		X		X	
9. Chain-of-custody form completed		X		X	
10. Required analytical methods requested		X		X	
11. Field (water and soil) sample logs completed properly		X		X	
12. Number and type of field QC samples collected (blanks, replicates, splits, etc.)		X		X	
13. Sample shipping		X		X	
14. Laboratory task order		X		X	

Field sampling logs = water and/or soil/sediment sampling logs QC - quality control

Comments:

All field documentation (Water Sampling Logs, Field Instrument Calibration, and Daily Logs) were reviewed for the above referenced sampling event.

Note: Several samples on the COCs were placed on hold. Some of these samples were later analyzed per ARCADIS and are included in RADFORD003.

One cooler temperature at the time of receipt was 1.5 degrees C. No qualification is necessary since none of the samples were frozen.

The SVOC analyses 1549HP008(05102008) was cancelled by ARCADIS due to insufficient sample volume.

VOLATILE ORGANIC COMPOUNDS

Items Reviewed	Deficiency Noted		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		DQM		DQM
B. Equipment blanks		DQM		DQM
C. Trip blanks		DQM		DQM
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS)				
A. LCS %R		DQM	DQM	
B. LCS duplicate (LCSD) %R		DQM	DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS)				
A. MS %R	NA		NA	
B. MS duplicate (MSD) %R	NA		NA	
C. MS/MSD precision (RPD)	NA		NA	
7. Instrument performance check	M		M	
8. Internal standard retention times and areas	M		M	
9. Initial calibration RRF's and %RSD's	M		M	
10. Continuing calibration RRF's and %D's		M		M
11. Raw Data Calculations	M		M	
12. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module
NA – Not Applicable

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8260.

2. There were no dilutions required.

3A. Methylene chloride was detected in the method blank for batches 514 water, 514 soil, and 515 soil. The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank value. (See attached table)

Methylene chloride and chloromethane were detected in the method blank for batch 520E soil. The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank value for acetone and less than five times for chloromethane. The associated field samples were non-detect for methylene chloride. No qualification is necessary. (See attached table)

3B. Acetone, chloromethane, and methylene chloride were detected in EB-01(05102008). The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank value for methylene chloride or acetone and less than five times for chloromethane. (See attached table)

3C. Methylene chloride was detected in TB-4(050908-1). The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank value. (See attached table)

Acetone, bromodichloromethane, chloroform, and methylene chloride were detected in TB-4(051008-01). The associated field samples are qualified as non-detect if the sample concentration is less than ten times the blank value for acetone and less than five times for chloroform. The associated field samples were non-detect for bromodichloromethane and methylene chloride. No qualification is necessary.

5. The recovery of 2-butanone was above the control limit in the LCSs for batches 514 soil and 520E soil. The associated field samples were non-detect for this compound. No qualification is necessary.

The recovery of chloromethane was above the control limit in the LCSD for batch 0514 soil. The associated field samples were non-detect for this compound. No qualification is necessary.

6. Site-specific MS/MSD analyses were not included in the data package. Method control was established with the LCS/LCSD analyses.

10. The CCVs analyzed on 05/14/08 exceeded the 20% D limit with a positive bias for acetone, 2-butanone, methyl acetate, and trichloroethene. 2-Butanone, methyl acetate, and trichloroethene were non-detect in the associated field samples. No qualification is necessary. All reported concentrations of acetone above the quantitation limit in the associated field samples were qualified with an "X" by the laboratory. All detections of acetone are qualified as estimated.

The CCVs analyzed on 05/14/08 exceeded the 20% D limit with a negative bias for bromomethane. All results for bromomethane associated with the CCVs were qualified with a "Y" by the laboratory. Bromomethane is qualified as estimated non-detect in all samples because the compounds was not detected.

The CCVs analyzed on 05/20/08 @ 1717 and 1748 met the criteria for averaging on the main mix but exceeded the 20% difference for 1,4-dioxane with a negative bias. All results for 1,4-

dioxane associated with the CCVs were qualified with a "Y" by the laboratory. All samples are qualified as estimated for 1,4-dioxane.

12. 1034DUP01 (0.5-1.5) was collected as a field duplicate of 1034SB006 (0.5-1.5). The RPDs were acceptable.

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SEMI-VOLATILE ORGANIC COMPOUNDS

Items Reviewed	Deficiency Noted		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		DQM		DQN
B. Equipment blanks	DQM		DQM	
4. Surrogate spike recoveries		DQM	DQM	
5. Laboratory control sample (LCS)				
A. LCS %R		DQM		DQM
B. LCS duplicate (LCSD) %R		DQM		DQM
C. LCS/LCSD RPD		DQM	DQM	
6. Matrix spike (MS)				
A. MS %R	NA			
B. MS duplicate (MSD) %R	NA			
C. MS/MSD precision (RPD)	NA			
7. Instrument performance check	M		M	
8. Internal standard retention times and areas		M	M	
9. Initial calibration RRF's and %RSD's		M	M	
10. Continuing calibration RRF's and %D's		M		M
11. Raw Data Calculations	M		M	
12. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module
NA – Not Applicable

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8270.

3A. Caprolactam was detected in MB515BW1 water. The associated field sample was the equipment blank. No qualification is necessary.

Caprolactam was detected in MB512BW1 soil. The associated field samples are qualified as non-detect if the sample concentration is less than five times the blank value (see attached table).

Acenaphthene, acenaphthylene, anthracene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, dibenzofuran, diethylphthalate, di-n-butylphthalate, di-n-octylphthalate, fluorene, and hexachloroethane were detected in MB515BS1 soil. The associated field samples were non-detect for all of these compounds with the exception of di-n-butyl phthalate. The associated

field samples are qualified as non-detect for di-n-butyl phthalate if the sample concentration is less than ten times the blank value (see attached table).

4. One surrogate recovery was slightly below the control limit in 1041SB003(0.5-1.5). Only one surrogate recovery was outside the control limit. No qualification is necessary.

5. The recovery of caprolactam was below the control limit in the LCS for batch 512BW1 water and the recovery of 2,4-dinitrophenol was above the control limit. The associated field samples were non-detect for 2,4-dinitrophenol. No qualification is necessary. All associated samples are qualified as estimated for caprolactam.

   The recovery of atrazine and 1,2,4,5-tetrachlorobenzene were below the control limit in the LCSD for batch 515BS1 soil. The associated field samples were qualified as estimated for these compounds. The RPDs for benzaldehyde, benzo(g,h,i)perylene, 4-nitrophenol, and pentachlorophenol were above the control limit. The associated field samples were non-detect for these compounds. No qualification is necessary.

   The recoveries of atrazine and caprolactam were below the control limit in the LCS for 515BW1 water. The associated field sample (EB-001) is qualified as estimated for these compounds.

6. Site-specific MS/MSD analyses were not included in the data package. Method control was established with the LCS/LCSD analyses.

8. The internal standard area count for d12-perylene slightly exceeded the control limit (200%) in 1034SB006(0.5-1.5). The field sample was non-detect for all SVOCs or qualified non-detect due to blank contamination. No qualification is necessary based on professional judgment and acceptable LCS recoveries.

9. The ICV exceeded the 20% D criteria with a high bias for benzo(g,h,i)perylene, 4-chloro-3-methylphenol, 2,4-dimethlyphenol, hexachlorocyclopentadiene, 4-nitroanaline, and pyrene. These compounds were not detected in the associated field samples. No qualification is necessary.

10. The CCV analyzed on 05/12/08 @ 1006 exceeded the 20% D for atrazine, benzaldehyde, carbazole, 3,3-dichlorobenzidine, hexachlorocylcopentadiene, and indeno(1,2,3-cd)perylene with negative biases. All results for these compounds associated with the CCV were qualified with a "Y" by the laboratory. All associated results were qualified as estimated or estimated non-detect.

The CCV analyzed on 05/13/08 @ 1115 exceeded the 20% D for atrazine, benzaldehyde, carbazole, 3,3-dichlorobenzidine, and hexachlorocylcopentadiene with negative biases. All results for these compounds associated with the CCV were qualified with a "Y" by the laboratory. All associated results were qualified as estimated or estimated non-detect.

The CCV analyzed on 05/15/08 @ 1058 exceeded the 20% D for atrazine, benzaldehyde, carbazole, 4-chloroanaline, 3,3-dichlorobenzidine, hexachlorocylcopentadiene, 2-nitroanaline, and 4-nitrophenol with negative biases. All results for these compounds associated with the CCV were qualified with a "Y" by the laboratory. All associated results were qualified as estimated or estimated non-detect.

12. 1034DUP01 (0.5-1.5) was collected as a field duplicate of 1034SB006 (0.5-1.5). The RPDs were acceptable at less than 70%.

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EXPLOSIVES

Items Reviewed	Deficiency Noted		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	DQM		DQM	
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	DQM		DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS)				
A. MS %R	NA		NA	
B. MS duplicate (MSD) %R	NA		NA	
C. MS/MSD precision (RPD)	NA		NA	
7. Instrument performance check	M		M	
8. Internal standard retention times and areas	M		M	
9. Initial calibration RRF's and %RSD's	M		M	
10. Continuing calibration RRF's and %D's	M		M	
11. Raw Data Calculations	M		M	
12. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module
NA – Not Applicable

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8330.

2. No dilutions were required.

6. Site-specific MS/MSD analyses were not included in this data package. Method control was established with the LCS/LCSD analyses.

12. 1034DUP01 (0.5-1.5) was collected as a field duplicate of 1034SB006 (0.5-1.5). The RPDs were acceptable at < 70%.

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POLYCHLORINATED BIPHENYLS (PCBs)

Items Reviewed	Deficiency Noted		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM			DQM
B. Equipment blanks	DQM		DQM	
4. Surrogate spike recoveries		DQM	DQM	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	DQM		DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS)				
A. MS %R	NA		NA	
B. MS duplicate (MSD) %R	NA		NA	
C. MS/MSD precision (RPD)	NA		NA	
7. Instrument performance check	M		M	
8. Internal standard retention times and areas	M		M	
9. Initial calibration RRF's and %RSD's	M		M	
10. Continuing calibration RRF's and %D's		M	M	
11. Raw Data Calculations	M		M	
12. Field Duplicate precision (RPD)	DQM		DQM	

DQM – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module
NA – Not Applicable

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by Method 8082.

2. No dilutions were required.

3A. PCB-1260 was detected in the soil method blank. The associated field samples are qualified as non-detect for this compound if the sample concentration is less than five times the blank value.

4. One surrogate recovery was above the control limit on the primary column for 1041HP004(05092008). There were no PCBs detected in the sample. No qualification is necessary.

One surrogate recovery was above the control limit on the primary column and confirmation column for 1041HP008(05092008). There were no PCBs detected in the sample. No qualification is necessary.

One surrogate recovery was above the control limit on the primary column for 1041HP001(05092008). The results were reported from the confirmation column. No qualification is necessary.

6. Site-specific MS/MSDs were not included in this data package. Method control was established with the LCS/LCSD analyses.

10. PCB-1254 exceeded the 20% D with a negative bias in the CCV analyzed on 05/16/08 @ 2335 for the confirmation column only. All associated field sample results were non-detect on the primary column. No qualification is necessary.

PCBs in the CCV analyzed on 05/18/08 @ 0643 exceeded the 20% D with a positive bias on the confirmation and primary column. The associated field samples were non-detect for these PCBs. No qualification is necessary.

12. 1034DUP01 (0.5-1.5) was collected as a field duplicate of 1034SB006 (0.5-1.5). The RPDs were acceptable at < 70%.

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METALS

Items Reviewed	Deficiency Noted		Qualification Applied	
	No	Yes	No	Yes
1. Holding times	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		DQM	DQM	
B. Equipment blanks	DQM		DQM	
4. Serial Dilution	M		M	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
6. Matrix spike				
A. Matrix spike (MS) %R		DQM		DQM
B. Matrix spike duplicate (MSD) %R		DQM		DQM
C. MS/MSD precision (RPD)		DQM		DQM
7. Initial calibration verification %R	M		M	
8. Continuing calibration verification %R	M		M	
9. Raw data calculations	M		M	
10. Field Duplicate precision (RPD)		DQM		DQM

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module
NA – Not Applicable

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed utilizing Method 6010B

3A. Manganese was detected in the method blank. The associated field samples were greater than ten times the blank value. No qualification is necessary.

6. 1034SB007(0.5-1.5) was utilized as a site-specific MS/MSD. The sample concentrations for aluminum, iron, and manganese were greater than four times the spike value. No qualification is necessary. The recoveries of antimony and calcium were below the control limit in the MS and/or MSD. The RPD for antimony was above the control limit. The post digestion spike was acceptable. The parent sample only is qualified as estimated for antimony and calcium based on professional judgment.

10. 1034DUP01 (0.5-1.5) was collected as a field duplicate of 1034SB006 (0.5-1.5). The RPDs for manganese, copper, cadmium, zinc and calcium were above the control limit (70%). The parent and the duplicate only are qualified as estimated for these compound based on professional judgment.

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Qualification Summary

SDG	Sample ID	Method	Analyte	result_value	Units	Qualifier	Reason for Qualification	Dilution
RADFORD002	1034DUP01 (0.5-1.5)	SW6010B	CADMIUM	0.32	mg/kg	J	Duplicate RPD	1
RADFORD002	1034DUP01 (0.5-1.5)	SW6010B	COPPER	39.9	mg/kg	J	Duplicate RPD	1
RADFORD002	1034DUP01 (0.5-1.5)	SW6010B	ZINC	82.7	mg/kg	J	Duplicate RPD	1
RADFORD002	1034DUP01 (0.5-1.5)	SW6010B	CALCIUM METAL	1360	mg/kg	J	Duplicate RPD	1
RADFORD002	1034DUP01 (0.5-1.5)	SW6010B	MANGANESE	276	mg/kg	J	Duplicate RPD	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8260B	ACETONE	56	ug/kg	J	Exceeded the %D in the CCV with a positive bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8260B	DICHLOROMETHANE	7.7	ug/kg	UB	Blank Contamination	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	Di-n-butylphthalate	40	ug/kg	UB	Blank Contamination	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	3-NITROANILINE	<1700	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	CARBAZOLE	<430	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<430	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	4-NITROPHENOL	<1700	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	P-CHLOROANILINE	<430	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<430	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	BENZALDEHYDE	<430	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034DUP01 (0.5-1.5)	SW8270C	ATRAZINE	<430	ug/kg	UJ	Spike Recovery	1
RADFORD002	1034SB006 (0.5-1.5)	SW6010B	COPPER	11.7	mg/kg	J	Duplicate RPD	1
RADFORD002	1034SB006 (0.5-1.5)	SW6010B	ZINC	25	mg/kg	J	Duplicate RPD	1
RADFORD002	1034SB006 (0.5-1.5)	SW6010B	CADMIUM	<1.3	mg/kg	UJ	Duplicate RPD	1
RADFORD002	1034SB006 (0.5-1.5)	SW6010B	MANGANESE	59.4	mg/kg	J	Duplicate RPD	1
RADFORD002	1034SB006 (0.5-1.5)	SW6010B	CALCIUM METAL	541	mg/kg	J	Duplicate RPD	1
RADFORD002	1034SB006 (0.5-1.5)	SW8260B	ACETONE	65	ug/kg	J	Exceeded the %D in the CCV with a positive bias	1
RADFORD002	1034SB006 (0.5-1.5)	SW8260B	DICHLOROMETHANE	11	ug/kg	UB	Blank Contamination	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	Di-n-butylphthalate	42	ug/kg	UB	Blank Contamination	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<420	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	3-NITROANILINE	<1700	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<420	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	ATRAZINE	<420	ug/kg	UJ	Spike Recovery	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	4-NITROPHENOL	<1700	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	P-CHLOROANILINE	<420	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	BENZALDEHYDE	<420	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (0.5-1.5)	SW8270C	CARBAZOLE	<420	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (7-8)	SW8260B	1,4-Dioxane	<78	ug/kg	J	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB006 (7-8)	SW8260B	DICHLOROMETHANE	17	ug/kg	UB	Blank Contamination	1

Radford 002
Qualification Summary

SDG	Sample ID	Method	Analyte	result_value	Units	Qualifier	Reason for Qualification	Dilution
RADFORD002	1034SB007 (0.5-1.5)	SW6010B	ANTIMONY	<3.7	mg/kg	UJ	Spike Recovery	1
RADFORD002	1034SB007 (0.5-1.5)	SW6010B	CALCIUM METAL	2070	mg/kg	J	Spike Recovery	1
RADFORD002	1034SB007 (0.5-1.5)	SW8260B	DICHLOROMETHANE	7.8	ug/kg	UB	Blank Contamination	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	ATRAZINE	<410	ug/kg	UJ	Spike Recovery	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	3-NITROANILINE	<1600	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	CARBAZOLE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	P-CHLOROANILINE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	BENZALDEHYDE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	4-NITROPHENOL	<1600	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (0.5-1.5)	SW8270C	Di-n-butylphthalate	47	ug/kg	UB	Blank Contamination	1
RADFORD002	1034SB007 (7-8)	SW8260B	1,4-Dioxane	<59	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1034SB007 (7-8)	SW8260B	DICHLOROMETHANE	18	ug/kg	UB	Blank Contamination	1
RADFORD002	1041HP001 (05092008)	SW8260B	BROMOMETHANE	<1	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP001 (05092008)	SW8270C	BENZALDEHYDE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP001 (05092008)	SW8270C	CAPROLACTAM	2.8	ug/l	UB	Blank Contamination	1
RADFORD002	1041HP001 (05092008)	SW8270C	ATRAZINE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP001 (05092008)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP001 (05092008)	SW8270C	3,3'-DICHLOROBENZIDINE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP003 (05092008)	SW8260B	BROMOMETHANE	<1	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP003 (05092008)	SW8270C	CAPROLACTAM	0.97	ug/l	UB	Blank Contamination	1
RADFORD002	1041HP003 (05092008)	SW8270C	ATRAZINE	<4.8	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP003 (05092008)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<4.8	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP003 (05092008)	SW8270C	3,3'-DICHLOROBENZIDINE	<4.8	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP003 (05092008)	SW8270C	BENZALDEHYDE	<4.8	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP004 (050908)	SW8260B	BROMOMETHANE	<1	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP004 (050908)	SW8270C	BENZALDEHYDE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP004 (050908)	SW8270C	CAPROLACTAM	1.5	ug/l	UB	Blank Contamination	1
RADFORD002	1041HP004 (050908)	SW8270C	ATRAZINE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041HP004 (050908)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1

Radford 002
Qualification Summary

SDG	Sample ID	Method	Analyte	result_value	Units	Qualifier	Reason for Qualification	Dilution
RADFORD002	1041HP004 (050908)	SW8270C	3,3'-DICHLOROBENZIDINE	<5	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (0.5-1.5)	SW8260B	DICHLOROMETHANE	6.9	ug/kg	UB	Blank Contamination	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	4-NITROPHENOL	<1600	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	3-NITROANILINE	<1600	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	CARBAZOLE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	ATRAZINE	<410	ug/kg	UJ	Spike Recovery	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	BENZALDEHYDE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (0.5-1.5)	SW8270C	P-CHLOROANILINE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (7-8)	SW8260B	1,4-Dioxane	<80	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB001 (7-8)	SW8260B	DICHLOROMETHANE	20	ug/kg	UB	Blank Contamination	1
RADFORD002	1041SB003 (0.5-1.5)	SW8260B	DICHLOROMETHANE	9.3	ug/kg	UB	Blank Contamination	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	CARBAZOLE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	3,3'-DICHLOROBENZIDINE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	P-CHLOROANILINE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	3-NITROANILINE	<1600	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	BENZALDEHYDE	<410	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	4-NITROPHENOL	<1600	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (0.5-1.5)	SW8270C	ATRAZINE	<410	ug/kg	UJ	Spike Recovery	1
RADFORD002	1041SB003 (7-8)	SW8260B	1,4-Dioxane	<77	ug/kg	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	1041SB003 (7-8)	SW8260B	CHLOROMETHANE	0.76	ug/kg	UB	Blank Contamination	1
RADFORD002	1041SB003 (7-8)	SW8260B	DICHLOROMETHANE	16	ug/kg	UB	Blank Contamination	1
RADFORD002	1549 HP008 (05102008)	SW8260B	CHLOROFORM	3.9	ug/l	UB	Blank Contamination	1
RADFORD002	1549 HP008 (05102008)	SW8260B	ACETONE	2	ug/l	UB	Blank Contamination	1
RADFORD002	5GP-HP021 (05102008)	SW8260B	ACETONE	5.2	ug/l	UB	Blank Contamination	1
RADFORD002	5GP-HP025 (05102008)	SW8260B	CHLOROFORM	0.46	ug/l	UB	Blank Contamination	1
RADFORD002	5GP-HP025 (05102008)	SW8260B	ACETONE	2	ug/l	UB	Blank Contamination	1

Radford 002
Qualification Summary

SDG	Sample ID	Method	Analyte	result_value	Units	Qualifier	Reason for Qualification	Dilution
RADFORD002	5GP-HP026 (05102008)	SW8260B	ACETONE	2	ug/l	UB	Blank Contamination	1
RADFORD002	EB001 (05102008)	SW8260B	DICHLOROMETHANE	1.4	ug/l	UB	Blank Contamination	1
RADFORD002	EB001 (05102008)	SW8270C	4-NITROPHENOL	<22	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	EB001 (05102008)	SW8270C	3-NITROANILINE	<22	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	EB001 (05102008)	SW8270C	3,3'-DICHLOROBENZIDINE	<5.6	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	EB001 (05102008)	SW8270C	CARBAZOLE	<5.6	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	EB001 (05102008)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<5.6	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	EB001 (05102008)	SW8270C	ATRAZINE	<5.6	ug/l	UJ	Spike Recovery	1
RADFORD002	EB001 (05102008)	SW8270C	ANTHRACENE	<5.6	ug/l	UJ	Spike Recovery	1
RADFORD002	EB001 (05102008)	SW8270C	P-CHLOROANILINE	<5.6	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	EB001 (05102008)	SW8270C	BENZALDEHYDE	0.75	ug/l	J	Exceeded the %D in the CCV with a negative bias	1
RADFORD002	EB001 (05102008)	SW8270C	CAPROLACTAM	<5.6	ug/l	UJ	Spike Recovery	1
RADFORD002	SSB-021 (23-24)	SW8260B	DICHLOROMETHANE	9.8	ug/kg	UB	Blank Contamination	1
RADFORD002	SSB-025 (19-20)	SW8260B	DICHLOROMETHANE	7.6	ug/kg	UB	Blank Contamination	1
RADFORD002	SSB-026 (19-20)	SW8260B	DICHLOROMETHANE	10	ug/kg	UB	Blank Contamination	1
RADFORD002	TB-4 (050908-01)	SW8260B	BROMOMETHANE	<1	ug/l	UJ	Exceeded the %D in the CCV with a negative bias	1

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Analytical data was evaluated in accordance with applicable USEPA SW-846 method requirements, "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999), "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (July 2002), "USEPA Region III National Functional Guidelines for Organic Data Review" (September 1994), "USEPA Region III National Functional Guidelines for Inorganic Data Review" (June 1995), site-specific requirements defined in *Radford Master Work Plan* (URS, 2003), and site-specific requirements defined in the *Quality Assurance Plan Addendum* (Arcadis, 2008). The validation presented in this review was performed at the RAAP defined Level I.

The data review summarized in this report includes a review of all sample collection documentation and the electronic data validation of the analytical data housed in the project database. Sample collection documentation included sample collection logs and chains of custody. The electronic data validation was performed utilizing the EQuIS Data Qualification Module (DQM). DQM checks for the following parameters:

- Holding times and preservation;
- Blank contamination;
  - Method blanks,
  - Trip blanks,
  - Equipment blanks;
- Matrix spike and Duplicate sample recovery;
- Matrix Spike and Matrix Spike Duplicate relative percent differences;
- Laboratory Control Sample and Duplicate recovery;
- Laboratory Control Sample and Duplicate relative percent differences;
- Surrogate recovery (organic analyses only); and
- Field duplicate relative percent difference.

Manually review was performed on the following items:

- Sample dilutions and reporting limits
- Case Narratives

Reviewed data was generated by Empirical Laboratories. Data qualifiers were applied electronically to the database with any additional qualifiers added manually. A summary of the data as amended by data qualifiers is included with the original hard copy reports. The attached table summarizes the data that were qualified due to QC deficiencies. The table indicates compounds/analytes qualified based on electronic and manual validation. Refer to the associated method section of the validation checklist for a detailed explanation of qualification. All other data in this SDG are considered usable as reported.

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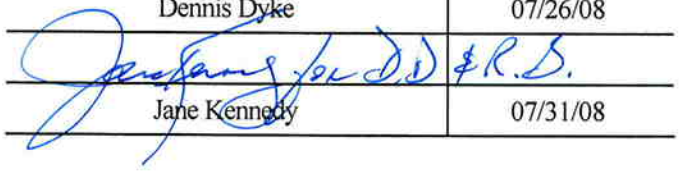
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The following list of data qualifiers and definitions were applied in accordance with qualification criteria defined in the above guidance documents:

J The analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reporting limit; however, the reported quantitation limit is approximate and may, or may not represent the actual limit of quantitation necessary to accurately and precisely measure analyte in the sample.

R The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria; and the presence or absence of the analyte cannot be verified.

DQM RUN BY:	Rachelle Borne	07/14/08
REVIEW PERFORMED BY:	Dennis Dyke	07/26/08
SIGNATURE:		
PEER REVIEW:	Jane Kennedy	07/31/08

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The following samples were included in this SDG:

Sample Delivery Group	Sample ID	Sample Date	Duplicate Parent Sample ID
RADFORD 003	1034SB001(7-8)	5/8/2008	
RADFORD 003	1034SB004(5-6)	5/8/2008	
RADFORD 003	1034SB006(7-8)	5/9/2008	
RADFORD 003	1034SB007(7-8)	5/9/2008	
RADFORD 003	1034SB008(4-5)	5/8/2008	
RADFORD 003	1041SB001(7-8)	5/9/2008	
RADFORD 003	1041SB002(7-8)	5/8/2008	
RADFORD 003	1041SB003(7-8)	5/9/2008	
RADFORD 003	1041SB004(7-8)	5/8/2008	
RADFORD 003	1549SB001(7-8)	5/7/2008	
RADFORD 003	1549SB003(5-6)	5/7/2008	
RADFORD 003	1549SB004(5-6)	5/7/2008	
RADFORD 003	1549SB006(5-6)	5/7/2008	
RADFORD 003	1549SB001(7-8)	5/7/2008	

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DATA PACKAGE DOCUMENTATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Sample depth for water					X
6. Collection technique (bailer, pump, etc.)		X		X	
7. Sample container type		X		X	
8. Preservation methods		X		X	
9. Chain-of-custody form completed		X		X	
10. Required analytical methods requested		X		X	
11. Field (water and soil) sample logs completed properly					X
12. Number and type of field QC samples collected (blanks, replicates, splits, etc.)					X
13. Sample shipping		X		X	
14. Laboratory task order		X		X	

Field sampling logs = water and/or soil/sediment sampling logs QC - quality control

Comments:
Field documentation (Water Sampling Logs, Field Instrument Calibration, and Daily Logs) were previously reviewed for the above referenced sampling event so no further review was performed.

Note: Several samples on the COCs had been placed on hold. This review covers those samples that were subsequently removed from hold status.

SEMI-VOLATILE ORGANIC COMPOUNDS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		M	M	
B. Equipment blanks	NA		NA	
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS)				
A. LCS %R		M		M
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
6. Matrix spike (MS)				
A. MS %R		M		M
B. MS duplicate (MSD) %R		M		M
C. MS/MSD precision (RPD)	M		M	
7. Field Duplicate precision (RPD)	NA		NA	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by EPA SW-846 Method 8270C.

Note: The "Y" flag was used by the laboratory to indicate that the %D for the analyte exceeded the control limit in the continuing calibration verification (CCV) with a negative bias. The "Y" value was changed to a "J" during this validation to indicate that it is an estimated value. See the attached qualification summary for details of the qualifications.

The "X" flag was used by the laboratory to indicate that the %D for the analyte exceeded the control limit in the initial calibration verification (ICV) with a positive bias. The "X" value was changed to a "J" during this validation to indicate that it is an estimated value. See the attached qualification summary for details of the qualifications.

2. No dilutions were required.

3A. Di-n-butyl phthalate was detected above the reporting limit (RL) in the laboratory method blank. Di-n-butyl phthalate was not detected in any of the samples, so data qualification is not warranted.

5A. The recoveries of caprolactam, 2,4-dinitrophenol, and 4-nitroaniline were above the upper control limit (UCL) in the LCS. These analytes were not detected in the associated field samples and, since the bias is high, data qualification is not warranted.

The recovery of benzaldehyde was below the lower control limit (LCL) in the LCS and the recovery was less than 10%. The associated field samples have been qualified as unusable ("R") for benzaldehyde.

6A-B. 1034SB007(7-8) was utilized as a site-specific MS/MSD. The recovery of 4-nitroaniline was above the UCL in the MS and MSD. 4-Nitroaniline was not detected in the associated field samples and, since the bias is high, data qualification is not warranted.

The recovery of benzaldehyde was below the LCL in the MS and MSD and the recoveries were less than 10%. The associated field samples have been qualified as unusable ("R") for benzaldehyde.

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EXPLOSIVES

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks A. Method blanks	DQM		DQM	
B. Equipment blanks	NA		NA	
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS) A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	DQM		DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS) A. MS %R	NA		NA	
B. MS duplicate (MSD) %R	NA		NA	
C. MS/MSD precision (RPD)	NA		NA	
7. Field Duplicate precision (RPD)	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by EPA SW-846 Method 8330.

2. No dilutions were required.

6. 1034SB007(7-8) was utilized as a site-specific MS/MSD. The recoveries and RPDs were acceptable.

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POLYCHLORINATED BIPHENYLS (PCBs)

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times/Preservation	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	NA		NA	
4. Surrogate spike recoveries	DQM		DQM	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	DQM		DQM	
C. LCS/LCSD RPD	DQM		DQM	
6. Matrix spike (MS)				
A. MS %R	DQM		DQM	
B. MS duplicate (MSD) %R	DQM		DQM	
C. MS/MSD precision (RPD)	DQM		DQM	
7. Field Duplicate precision (RPD)	NA		NA	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by EPA SW-846 Method 8082.

Note: The case narrative noted that the surrogate response exceeded the calibration criteria with a high bias in the CCV. Surrogate recoveries were evaluated and determined not to have been biased into control by the exceedance so data qualification is unnecessary.

The laboratory noted that the Aroclor-1254 detected in sample 1549SB004(5-6) and the Aroclor-1260 detected in sample 1034SB008(4-5) did not match the chromatographic patterns of the calibration standards. They were quantified based on the closest Aroclor match. Data qualification is unnecessary.

2. No dilutions were required.

6. 1034SB007(7-8) was utilized as a site-specific MS/MSD. The recoveries and RPDs were acceptable.

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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 003

METALS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times		M		M
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks	DQM		DQM	
B. Equipment blanks	DQM		DQM	
4. Serial Dilution	NA		NA	
5. Laboratory control sample (LCS)				
A. LCS %R	DQM		DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD RPD	NA		NA	
6. Matrix spike				
A. Matrix spike (MS) %R		DQM		DQM
B. Matrix spike duplicate (MSD) %R		DQM		DQM
C. MS/MSD precision (RPD)	DQM		DQM	
7. Post digestion spike (%R)	M		M	
8. Laboratory duplicate (RPD)	M		M	
9. Field Duplicate precision (RPD)	NA		NA	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed utilizing EPA SW-846 Methods 6010B and 7471A.

Note: Metals detected between the MDL and RL were flagged with a "B" by the laboratory. The "B" was changed in this validation to a "J" to indicate that this is an estimated value.

1. The samples were removed from "hold" status after the mercury holding time had elapsed. The samples were analyzed for mercury between five and seven days past the 28 day holding time. Therefore, the mercury results have been qualified as estimated ("J" or "UJ").

6A-B. Sample 1034SB007(7-8) was utilized as a site-specific MS/MSD. The sample concentrations of aluminum and iron were greater than four times the spiking amount, and so the recovery calculations are not reliable indicators of method performance, and thus data qualification is not warranted.

The recoveries of antimony were below the LCL in the MS and MSD. The recovery of manganese was above the UCL in the MS and MSD. Antimony was not detected in any of the

samples so the antimony results have been qualified as estimated ("UJ") with a possible low bias. All manganese results have been qualified as estimated ("J") with a possible high bias.

7. 1034SB007(7-8) was utilized as a site-specific post digestion spike sample. The concentration of iron in the parent sample was greater than four times the spiking amount so data qualification is unnecessary.

Qualification Summary
Radford 003

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	DF
RADFORD003	1034SB001 (7-8)	SW6010B	ANTIMONY	<3.8	mg/kg	UJ	Spike Recovery	1
RADFORD003	1034SB001 (7-8)	SW6010B	MANGANESE	164	mg/kg	J	Spike Recovery	1
RADFORD003	1034SB001 (7-8)	SW7471A	MERCURY	0.017	mg/kg	J	Holding Time	1
RADFORD003	1034SB001 (7-8)	SW8270C	BENZALDEHYDE	<450	ug/kg	R	Spike Recovery	1
RADFORD003	1034SB001 (7-8)	SW8270C	PYRENE	<450	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB001 (7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<450	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB001 (7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<450	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB004 (5-6)	SW6010B	MANGANESE	979	mg/kg	J	Spike Recovery	1
RADFORD003	1034SB004 (5-6)	SW6010B	ANTIMONY	<4.7	mg/kg	UJ	Spike Recovery	1
RADFORD003	1034SB004 (5-6)	SW7471A	MERCURY	<0.051	mg/kg	UJ	Holding Time	1
RADFORD003	1034SB004 (5-6)	SW8270C	3,3'-DICHLOROBENZIDINE	<520	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB004 (5-6)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<520	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB004 (5-6)	SW8270C	BENZALDEHYDE	<520	ug/kg	R	Spike Recovery	1
RADFORD003	1034SB004 (5-6)	SW8270C	PYRENE	<520	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB006 (7-8)	SW6010B	MANGANESE	92.4	mg/kg	J	Spike Recovery	1
RADFORD003	1034SB006 (7-8)	SW6010B	ANTIMONY	<3.6	mg/kg	UJ	Spike Recovery	1
RADFORD003	1034SB006 (7-8)	SW7471A	MERCURY	<0.042	mg/kg	UJ	Holding Time	1
RADFORD003	1034SB006 (7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<410	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB006 (7-8)	SW8270C	BENZALDEHYDE	<410	ug/kg	R	Spike Recovery	1
RADFORD003	1034SB006 (7-8)	SW8270C	PYRENE	<410	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB006 (7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<410	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB007 (7-8)	SW6010B	MANGANESE	356	mg/kg	J	Spike Recovery	1
RADFORD003	1034SB007 (7-8)	SW6010B	ANTIMONY	<3.3	mg/kg	UJ	Spike Recovery	1
RADFORD003	1034SB007 (7-8)	SW7471A	MERCURY	<0.037	mg/kg	UJ	Holding Time	1
RADFORD003	1034SB007 (7-8)	SW8270C	BENZALDEHYDE	<370	ug/kg	R	Spike Recovery	1
RADFORD003	1034SB007 (7-8)	SW8270C	PYRENE	<370	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB007 (7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<370	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB007 (7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<370	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB008 (4-5)	SW6010B	MANGANESE	1090	mg/kg	J	Spike Recovery	1
RADFORD003	1034SB008 (4-5)	SW6010B	ANTIMONY	<3.3	mg/kg	UJ	Spike Recovery	1
RADFORD003	1034SB008 (4-5)	SW7471A	MERCURY	0.25	mg/kg	J	Holding Time	1
RADFORD003	1034SB008 (4-5)	SW8270C	BENZALDEHYDE	<390	ug/kg	R	Spike Recovery	1

Qualification Summary
Radford 003

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	DF
RADFORD003	1034SB008 (4-5)	SW8270C	3,3'-DICHLOROBENZIDINE	<390	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB008 (4-5)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<390	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1034SB008 (4-5)	SW8270C	PYRENE	5300	ug/kg	J	%D exceeded the control limit	1
RADFORD003	1034SB008 (4-5)	SW8270C	Benzo(b)fluoranthene	4000	ug/kg	J	%D exceeded the control limit	1
RADFORD003	1041SB001 (7-8)	SW6010B	MANGANESE	1530	mg/kg	J	Spike Recovery	1
RADFORD003	1041SB001 (7-8)	SW6010B	ANTIMONY	<4.3	mg/kg	UJ	Spike Recovery	1
RADFORD003	1041SB001 (7-8)	SW7471A	MERCURY	<0.051	mg/kg	UJ	Holding Time	1
RADFORD003	1041SB001 (7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<500	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB001 (7-8)	SW8270C	PYRENE	<500	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB001 (7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<500	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB001 (7-8)	SW8270C	BENZALDEHYDE	<500	ug/kg	R	Spike Recovery	1
RADFORD003	1041SB002 (7-8)	SW6010B	ANTIMONY	<3.7	mg/kg	UJ	Spike Recovery	1
RADFORD003	1041SB002 (7-8)	SW6010B	MANGANESE	538	mg/kg	J	Spike Recovery	1
RADFORD003	1041SB002 (7-8)	SW7471A	MERCURY	0.057	mg/kg	J	Holding Time	1
RADFORD003	1041SB002 (7-8)	SW8270C	BENZALDEHYDE	<430	ug/kg	R	Spike Recovery	1
RADFORD003	1041SB002 (7-8)	SW8270C	PYRENE	<430	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB002 (7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<430	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB002 (7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<430	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB003 (7-8)	SW6010B	MANGANESE	487	mg/kg	J	Spike Recovery	1
RADFORD003	1041SB003 (7-8)	SW6010B	ANTIMONY	<4.4	mg/kg	UJ	Spike Recovery	1
RADFORD003	1041SB003 (7-8)	SW7471A	MERCURY	<0.048	mg/kg	UJ	Holding Time	1
RADFORD003	1041SB003 (7-8)	SW8270C	BENZALDEHYDE	<490	ug/kg	R	Spike Recovery	1
RADFORD003	1041SB003 (7-8)	SW8270C	PYRENE	<490	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB003 (7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<490	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB003 (7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<490	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB004 (7-8)	SW6010B	ANTIMONY	<4.2	mg/kg	UJ	Spike Recovery	1
RADFORD003	1041SB004 (7-8)	SW6010B	MANGANESE	893	mg/kg	J	Spike Recovery	1
RADFORD003	1041SB004 (7-8)	SW7471A	MERCURY	<0.041	mg/kg	UJ	Holding Time	1
RADFORD003	1041SB004 (7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<480	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB004 (7-8)	SW8270C	PYRENE	<480	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1041SB004 (7-8)	SW8270C	BENZALDEHYDE	<480	ug/kg	R	Spike Recovery	1
RADFORD003	1041SB004 (7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<480	ug/kg	UJ	%D exceeded the control limit	1

Qualification Summary
Radford 003

SDG	Sample ID	Method	Analyte	Result	Units	Qualifier	Reason	DF
RADFORD003	1549SB001(7-8)	SW6010B	ANTIMONY	<3.4	mg/kg	UJ	Spike Recovery	1
RADFORD003	1549SB001(7-8)	SW6010B	MANGANESE	83.6	mg/kg	J	Spike Recovery	1
RADFORD003	1549SB001(7-8)	SW7471A	MERCURY	0.054	mg/kg	J	Holding Time	1
RADFORD003	1549SB001(7-8)	SW8270C	PYRENE	<390	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB001(7-8)	SW8270C	3,3'-DICHLOROBENZIDINE	<390	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB001(7-8)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<390	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB001(7-8)	SW8270C	BENZALDEHYDE	<390	ug/kg	R	Spike Recovery	1
RADFORD003	1549SB003(5-6)	SW6010B	ANTIMONY	<3.4	mg/kg	UJ	Spike Recovery	1
RADFORD003	1549SB003(5-6)	SW6010B	MANGANESE	201	mg/kg	J	Spike Recovery	1
RADFORD003	1549SB003(5-6)	SW7471A	MERCURY	<0.036	mg/kg	UJ	Holding Time	1
RADFORD003	1549SB003(5-6)	SW8270C	PYRENE	<380	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB003(5-6)	SW8270C	BENZALDEHYDE	<380	ug/kg	R	Spike Recovery	1
RADFORD003	1549SB003(5-6)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<380	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB003(5-6)	SW8270C	3,3'-DICHLOROBENZIDINE	<380	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB004(5-6)	SW6010B	MANGANESE	341	mg/kg	J	Spike Recovery	1
RADFORD003	1549SB004(5-6)	SW6010B	ANTIMONY	<3.8	mg/kg	UJ	Spike Recovery	1
RADFORD003	1549SB004(5-6)	SW7471A	MERCURY	0.069	mg/kg	J	Holding Time	1
RADFORD003	1549SB004(5-6)	SW8270C	3,3'-DICHLOROBENZIDINE	<420	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB004(5-6)	SW8270C	BENZALDEHYDE	<420	ug/kg	R	Spike Recovery	1
RADFORD003	1549SB004(5-6)	SW8270C	PYRENE	<420	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB004(5-6)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<420	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB006(5-6)	SW6010B	ANTIMONY	<3.7	mg/kg	UJ	Spike Recovery	1
RADFORD003	1549SB006(5-6)	SW6010B	MANGANESE	147	mg/kg	J	Spike Recovery	1
RADFORD003	1549SB006(5-6)	SW7471A	MERCURY	0.065	mg/kg	J	Holding Time	1
RADFORD003	1549SB006(5-6)	SW8270C	3,3'-DICHLOROBENZIDINE	<420	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB006(5-6)	SW8270C	BENZALDEHYDE	<420	ug/kg	R	Spike Recovery	1
RADFORD003	1549SB006(5-6)	SW8270C	PYRENE	<420	ug/kg	UJ	%D exceeded the control limit	1
RADFORD003	1549SB006(5-6)	SW8270C	HEXACHLOROCYCLOPENTADIENE	<420	ug/kg	UJ	%D exceeded the control limit	1

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

Analytical data was evaluated in accordance with applicable USEPA SW-846 method requirements, "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (October 1999), "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (July 2002), "USEPA Region III National Functional Guidelines for Organic Data Review" (September 1994), "USEPA Region III National Functional Guidelines for Inorganic Data Review" (June 1995), site-specific requirements defined in *Radford Master Work Plan* (URS, 2003), and site-specific requirements defined in the *Quality Assurance Plan Addendum* (Arcadis, 2008).

The data review summarized in this report includes a review of all sample collection documentation and the electronic data validation of the analytical data housed in the project database. Sample collection documentation included sample collection logs and chains of custody. The electronic data validation was performed utilizing the EQuIS Data Qualification Module (DQM). DQM checks for the following parameters:

- Holding times and preservation;
- Blank contamination;
  - Method blanks,
  - Trip blanks,
  - Equipment blanks;
- Matrix spike and Duplicate sample recovery;
- Matrix Spike and Matrix Spike Duplicate relative percent differences;
- Laboratory Control Sample and Duplicate recovery;
- Laboratory Control Sample and Duplicate relative percent differences;
- Surrogate recovery (organic analyses only); and
- Field duplicate relative percent difference.

Manually review was performed on the following items:

- Sample dilutions and reporting limits
- Case Narratives

Reviewed data was generated by Empirical Laboratories. Data qualifiers were applied electronically to the database with any additional qualifiers added manually. A summary of the data as amended by data qualifiers is included with the original hard copy reports. The attached table summarizes the data that were qualified due to QC deficiencies. The table indicates compounds/analytes qualified based on electronic and manual validation. Refer to the associated

method section of the validation checklist for a detailed explanation of qualification. All other data in this SDG are considered usable as reported.

The following list of data qualifiers and definitions were applied in accordance with qualification criteria defined in the above guidance documents:

UB Compound/analyte detected in blank or associated blank, qualified as a non-detect at listed value.

J The analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reporting limit; however, the reported quantitation limit is approximate and may, or may not represent the actual limit of quantitation necessary to accurately and precisely measure analyte in the sample.

R The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria; and the presence or absence of the analyte cannot be verified.

DQM RUN BY:	Rachelle Borne	08/18/08
REVIEW PERFORMED BY:	Dennis Dyke	08/22/08
SIGNATURE:		8/25/08
PEER REVIEW:	Jane Kennedy	08/25//08

ARCADIS

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

The following samples were included in this SDG:

Sample Delivery Group	Sample ID	Sample Date	Duplicate Parent Sample ID
0806207	31MW002(061808)	6/18/08	
0806207	31MWDUP001(061808)	6/18/08	31MW002(061808)
0806207	EB001(061808)	6/18/08	
0806274	5GP027(25-28)(062508)	6/25/08	
0806274	TB-2(062508)	6/25/08	
0806275	1041006(0.5-1)	6/25/08	
0806275	1041007(0.5-1)	6/25/08	
0806275	1041008(0.5-1)	6/25/08	
0806303	1041DUP001(8-9)	6/26/08	1041SB011(8-9)
0806303	1041SB009(7-8)	6/26/08	
0806303	1041SB010(7-8)	6/26/08	
0806303	1041SB011(8-9)	6/26/08	
0806303	1041SB014(6-7)	6/26/08	
0806310	1041DUP001(22-25)(062708)	6/27/08	1041HP018(22-25)(062708)
0806310	1041HP015(062708)	6/27/08	
0806310	1041HP016(17-28)(062708)	6/27/08	
0806310	1041HP017(22-25)(062708)	6/27/08	
0806310	1041HP017(30-33)(062708)	6/27/08	
0806310	1041HP018(22-25)(062708)	6/27/08	
0806310	1041HP018(31-34)(062708)	6/27/08	
0806310	TB-3(062708)	6/27/08	
0806311	1041SB018(6-7)	6/27/08	
0806311	1041SB019(6-7)	6/27/08	
0807007	1041HP001A(062908)	6/29/08	
0807007	1041HP019(18-28)(063008)	6/30/08	
0807007	5GP029(15-22)(062808)	6/28/08	
0807007	5GP029(35-38)(062808)	6/28/08	
0807007	5GP030(14-23.5)(062908)	6/29/08	
0807007	5GP031(15-19.5)(062808)	6/28/08	
0807007	5GP031(35-38)(062908)	6/29/08	
0807007	5GP032(15-18.5)(063008)	6/30/08	
0807007	5GP033(17-24)(062908)	6/29/08	
0807007	5GP034(27-30)(063008)	6/30/08	
0807007	5GPDUP001(15-19.5)(062808)	6/28/08	5GP031(15-19.5)(062808)
0807007	EB001(062908)	6/29/08	
0807007	TB-4(063008)	6/30/08	

ARCADIS

RADFORD ARMY AMMUNITION PLANT
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RADFORD 004

Sample Delivery Group	Sample ID	Sample Date	Duplicate Parent Sample ID
0807029	ASB003(0-1)	6/30/08	
0807029	ASB005(0-1)	6/30/08	
0807029	ASB006(0-1)	6/30/08	
0807029	ASB006(5-6)	6/30/08	
0807029	ASB007(0-1)	6/30/08	
0807029	ASB007(5-6)	6/30/08	
0807029	ASB008(0-1)	6/30/08	
0807029	ASB008(5-6)	6/30/08	
0807029	ASB009(0-1)	6/30/08	
0807029	ASB009(5-6)	6/30/08	
0807029	ASB010(0-1)	6/30/08	
0807029	ASB010(5-6)	6/30/08	
0807029	ASBDUP001(0-1)	6/30/08	ASB005(0-1)
0807029	EB-2(063008)	6/30/08	

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

DATA PACKAGE DOCUMENTATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Sample depth for water					X
6. Collection technique (bailer, pump, etc.)		X		X	
7. Sample container type		X		X	
8. Preservation methods		X		X	
9. Chain-of-custody form completed		X		X	
10. Required analytical methods requested		X		X	
11. Field (water and soil) sample logs completed properly					X
12. Number and type of field QC samples collected (blanks, replicates, splits, etc.)					X
13. Sample shipping		X		X	
14. Laboratory task order		X		X	

Field sampling logs = water and/or soil/sediment sampling logs QC - quality control

Comments:

Field documentation (Water Sampling Logs, Field Instrument Calibration, and Daily Logs) were not reviewed for the above referenced sampling.

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

VOLATILE ORGANIC COMPOUNDS (VOCs)

Items Reviewed	Deficiency		Qualification Applied		Not Required
	No	Yes	No	Yes	
1. Holding times/Preservation	X		X		
2. Reporting limits	X		X		
3. Blanks A. Method blanks		X		X	
B. Equipment blanks		X		X	
C. Trip blanks		X		X	
4. Surrogate spike recoveries	X		X		
5. Laboratory control sample (LCS) A. LCS %R		X	X		
B. LCS duplicate (LCSD) %R					X
C. LCS/LCSD RPD					X
6. Matrix spike (MS) A. MS %R		X		X	
B. MS duplicate (MSD) %R		X		X	
C. MS/MSD precision (RPD)		X	X		
7. Field Duplicate precision (RPD)	X		X		

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by EPA SW-846 Method 8260B.

Note: The "Y" flag was used by the laboratory to indicate that the percent difference (%D) for the analyte exceeded the control limit in the continuing calibration verification (CCV) with a negative bias. The "Y" value was changed to a "J" during this validation to indicate that the reported value should be considered as an estimated concentration. See the attached qualification summary for details of the qualifications.

3A-C. Acetone, methylene chloride, chloroform, and toluene were detected in one or more of the trip, equipment, and/or laboratory method blanks. The sample results for acetone and methylene chloride that were detected at less than ten times the blank concentrations have been qualified as not detected ("UB") at the reported concentrations. Detections of chloroform and toluene in the field samples that are less than 5 times the blank concentration, are qualified as non-detect (UB) at the reported value.

Cyclohexane and isopropylbenzene were detected in one or more of the laboratory method blanks. These compounds were not detected in any of the associated samples, so data qualification is not warranted.

5A-C. The recovery of chloromethane and toluene were above the upper control limit (UCL) in the LCS analyzed on 7/2/08. Since these compounds were not detected in the associated samples and the bias is high, data qualification is not warranted.

The recovery of acetone was above the UCL in the LCS analyzed on 7/1/08. Data qualification is not warranted since the high bias may be due to the contamination evident in the blanks and since all acetone results in the associated samples have been already qualified as not detected.

6A-C. 1041HP018(31-34) was utilized as a site-specific MS/MSD sample in SDG 0806310. The recoveries of chloromethane and toluene were above the UCL and the recoveries of methyl acetate and 1,3-dichlorobenzene were below the lower control limit (LCL). These compounds were not detected in the parent sample. Qualification of chloromethane and toluene is not warranted. Methyl acetate and 1,3-dichlorobenzene have been qualified as estimated not detected ("UJ") in the parent sample with a potential low bias.

5GP033(17-24)(062908) was utilized as a site-specific MS/MSD sample. The recovery of 1,4-dioxane was below the LCL and the RPD of bromomethane was above the control limit. These compounds were not detected in the parent sample. Qualification of bromomethane is not warranted since the recoveries were within the control limits. 1,4-Dioxane has been qualified as estimated not detected ("UJ") in the parent sample.

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SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)

Items Reviewed	Deficiency		Qualification Applied		Not Required
	No	Yes	No	Yes	
1. Holding times/Preservation	X		X		
2. Reporting limits	X		X		
3. Blanks A. Method blanks		X	X		
B. Equipment blanks		X	X		
4. Surrogate spike recoveries	X		X		
5. Laboratory control sample (LCS) A. LCS %R		X		X	
B. LCS duplicate (LCSD) %R		X		X	
C. LCS/LCSD RPD		X	X		
6. Matrix spike (MS) A. MS %R		X		X	
B. MS duplicate (MSD) %R		X		X	
C. MS/MSD precision (RPD)		X		X	
7. Field Duplicate precision (RPD)		X		X	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by EPA SW-846 Method 8270C.

Note: The "Y" flag was used by the laboratory to indicate that the %D for the analyte exceeded the control limit in the continuing calibration verification (CCV) with a negative bias. The "Y" value was changed to a "J" during this validation to indicate that the reported value should be considered as an estimated concentration. See the attached qualification summary for details of the qualifications.

The "X" flag was used by the laboratory to indicate that the %D for the analyte exceeded the control limit in the initial calibration verification (ICV) with a positive bias. The "X" value was changed to a "J" during this validation to indicate that reported value should be considered as estimated. See the attached qualification summary for details of the qualifications.

2. No non-detected results were reported with elevated reporting limits due to dilutions associated with elevated concentrations of target compounds.

3A-B. Caprolactam was detected below the RL in the water laboratory method blank, benzaldehyde and caprolactam were detected below the RLs in the equipment blank EB2(063008), and 2-

methylnaphthalene was detected above the RL in the equipment blank EB001(061808). Since these compounds were not detected in any of the project samples, data qualification is not warranted.

5A-C. (SDG 0807029) In the water LCS/LCSD, the recovery of caprolactam was below the LCL, the recoveries of 4,6-dinitro-2-methylphenol, 2,4-dinitrophenol, and pentachlorophenol were above the UCL, and the RPD of 2,4-dimethylphenol was above the control limit. These compounds were not detected in the associated sample (i.e. equipment blank). Since the bias is high for the phenols, data qualification is not warranted. Caprolactam is already qualified as estimated in the equipment blank so further qualification is unnecessary.

(SDG 0807029) In both soil LCS/LCSD pairs, the recovery of benzaldehyde was below the LCL and the recoveries were less than 10%. The associated field samples have been qualified as unusable ("R") for benzaldehyde. The recovery of 2,4-dinitrophenol was above the UCL and the RPD was above the control limit. Since 2,4-dinitrophenol was not detected in the samples and the bias is high, data qualification is not warranted.

6A-C. (SDG 0807029) ASB009(0-1) was utilized as a site-specific MS/MSD sample. Benzaldehyde was not recovered (i.e. zero percent recovery) in the MS and MSD. The associated field samples have been qualified as unusable ("R") for benzaldehyde. The recovery of di-n-butyl phthalate was above the UCL in the MS and the RPD was above the control limit. Di-n-butyl phthalate has been qualified as estimated ("J" or "UJ") for the associated project samples.

7. (SDG 0807029) The 70% RPD control limit was exceeded in the soil field duplicate analysis for 2,4-dinitrotoluene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, bis(2-ethylhexyl) phthalate, di-n-butyl phthalate, fluoranthene, and indeno(1,2,3-cd)pyrene. These compounds have been qualified as estimated ("J" or "UJ") in the field duplicate samples, ASB005(0-1) and ASBDUP001(0-1).

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POLYCHLORINATED BIPHENYLS (PCBs)

Items Reviewed	Deficiency		Qualification Applied		Not Required
	No	Yes	No	Yes	
1. Holding times/Preservation	X		X		
2. Reporting limits	X		X		
3. Blanks A. Method blanks	X		X		
B. Equipment blanks	X		X		
4. Surrogate spike recoveries	X		X		
5. Laboratory control sample (LCS) A. LCS %R		X	X		
B. LCS duplicate (LCSD) %R					X
C. LCS/LCSD RPD					X
6. Matrix spike (MS) A. MS %R	X		X		
B. MS duplicate (MSD) %R		X			
C. MS/MSD precision (RPD)	X		X		
7. Field Duplicate precision (RPD)	X		X		

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed by EPA SW-846 Method 8082.

Note: The "1" flag was used by the laboratory to indicate that the chromatographic pattern of the detected Aroclor did not compare well with the chromatographic pattern of the calibration standards and that the identification was based on the closest match. Since the detector used in the analysis only responds to halogenated compounds, the detected Aroclor patterns may be different from the standard due to weathering or the presence of more than one Aroclor. The "1" value was changed to a "J" during this validation to indicate that the detection is estimated and the reported value should be used as an estimated concentration. See the attached qualification summary for details of the qualifications.

4B. The recovery of Aroclor-1016 was slightly above the UCL in the LCS. All detected results have already been qualified as estimated, so further qualification is not warranted.

6B. ASB009(0-1) was utilized as a site-specific MS/MSD sample. The recoveries in the MSD were slightly above the UCL. All detected results have already been qualified as estimated, so further qualification is not warranted.

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METALS

Items Reviewed	Deficiency		Qualification Applied		Not Required
	No	Yes	No	Yes	
1. Holding times/Preservation	X		X		
2. Reporting limits	X		X		
3. Blanks A. Method blanks		X	X		
B. Equipment blanks					X
4. Laboratory duplicate sample	X		X		
5. Laboratory control sample (LCS) A. LCS %R	X		X		
B. LCS duplicate (LCSD) %R					X
C. LCS/LCSD RPD					X
6. Matrix spike (MS) A. MS %R		X	X		
B. MS duplicate (MSD) %R		X	X		
C. MS/MSD precision (RPD)	X		X		
7. Post digestion spike sample %R	X		X		
8. Serial dilution					X
9. Field Duplicate precision (RPD)	X		X		

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed utilizing EPA SW-846 Methods 6010B and 7471A.

Note: Metals detected between the MDL and RL were flagged with a "B" by the laboratory. The "B" was changed in this validation to a "J" to indicate that the concentration is an estimated value.

3A. Lead was detected below the RL in one of the calibration blanks and in the laboratory method blank. The lead concentrations in the project samples were greater than ten times the blank amounts, so data qualification is not warranted.

6A-B. ASB009(0-1) was utilized as a site-specific MS/MSD sample. The recoveries of aluminum and iron exceeded the control limits. The sample concentrations of aluminum and iron in the parent sample were greater than four times the spiking amount, so the recovery calculations are not reliable indicators of method performance, and thus data qualification is not warranted.

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VALIDATION CHECKLIST
SUMMARY AND DATA QUALIFIER CODES

Sample ID	Analyte(s)	Qualifier	Reason(s)
VOCs			
5GP027(25-28)(062508) 1041DUP001(22-25)(062708) 1041HP016(17-28)(062708) 1041HP017(22-25)(062708) 1041HP017(30-33)(062708) 1041HP018(22-25)(062708) 1041HP018(31-34) 1041SB019(6-7) 1041HP019(18-28)(063008) 5GP029(15-22)(062808) 5GP029(35-38)(062808) 5GP030(14-23.5)(062908) 5GP031(15-19.5)(062808) 5GP031(35-38)(062908) 5GP032(15-18.5)(063008) 5GP033(17-24)(062908) 5GP034(27-30)(063008)	Acetone	UB	Detected in Blank(s)
5GP027 (25-28)(062508) 1041DUP001(8-9) 1041SB009(7-8) 1041SB010(7-8) 1041SB011(8-9) 1041SB014(6-7) 1041SB018 (6-7) 1041SB019 (6-7)	Dichloromethane	UB	Detected in Blank(s)
5GP027 (25-28)(062508) 1041HP015(062708) 5GP029(15-22)(062808) 5GP029(35-38)(062808) 5GP034(27-30)(063008)	Chloroform	UB	Detected in Blank(s)

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Sample ID	Analyte(s)	Qualifier	Reason(s)
1041DUP001(8-9) 1041SB009(7-8) 1041SB010(7-8) 1041SB011(8-9) 1041SB014(6-7) 1041DUP001(22-25)(062708) 1041HP015 (062708) 1041HP016(17-28)(062708) 1041HP017 (22-25)(062708) 1041HP017 (30-33)(062708) 1041HP018 (22-25)(062708) 1041HP018 (31-34) TB-3 (062708) 1041SB018(6-7) 1041SB019(6-7) 1041HP019(18-28)(063008) 5GP029(15-22)(062808) 5GP029(35-38)(062808) 5GP030(14-23.5)(062908) 5GP031(15-19.5)(062808) 5GP031(35-38)(062908) 5GP032(15-18.5)(063008) 5GP034(27-30)(063008) 5GPDUP001(15-19.5)(062808) EB001(062908) TB-4(063008)	1,4-Dioxane	UJ	CCV rec. < LCL
1041HP019(18-28)(063008) 5GP029(15-22)(062808) 5GP029(35-38)(062808) 5GP030(14-23.5)(062908) 5GP031(15-19.5)(062808) 5GP031(35-38)(062908) 5GP032(15-18.5)(063008) 5GP033(17-24)(062908) 5GP034(27-30)(063008) 5GPDUP001(15-19.5)(062808) EB001(062908) TB-4(063008)	Bromomethane 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	UJ	CCV rec. < LCL
5GP033(17-24)(062908)	1,4-Dioxane	UJ	CCV rec. < LCL MS/MSD rec. < LCL
1041HP018 (31-34)	m-Dichlorobenzene Methyl acetate	UJ	MS/MSD rec. < LCL

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Sample ID	Analyte(s)	Qualifier	Reason(s)
SVOCs			
31MW002(061808) 31MWDUP001(061808) EB001(061808)	Indeno(1,2,3-cd)pyrene	UJ	CCV rec. < LCL
ASB003(0-1) ASB005(0-1) ASB006(0-1) ASB006(5-6) ASB007(0-1) ASB007(5-6) ASB008(0-1) ASB008(5-6) ASB009(0-1) ASB009(5-6) ASB010(0-1) ASB010(5-6) ASBDUP001(0-1)	Benzaldehyde	R	MS/MSD & LCS/LCSD rec. < 10%
ASB003(0-1) ASB005(0-1) ASB006(5-6) ASB007(0-1) ASB007(5-6) ASB008(0-1) ASB008(5-6) ASB009(0-1) ASB009(5-6) ASB010(0-1) ASB010(5-6) ASBDUP001(0-1) EB-2(063008)	2,4-Dimethylphenol 3,3'-Dichlorobenzidine 3-Nitroaniline 4-Nitrophenol Atrazine Carbazole Hexachlorocyclopentadiene p-Chloroaniline	J or UJ	CCV rec. < LCL
ASB005(0-1) ASBDUP001(0-1)	2,4-Dinitrotoluene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene bis(2-Ethylhexyl)phthalate Fluoranthene Indeno(1,2,3-cd)pyrene	J or UJ	Field dup. RPD > CL
ASBDUP001(0-1)	Pyrene	J	ICV rec. > UCL

Sample ID	Analyte(s)	Qualifier	Reason(s)
ASB003(0-1) ASB005(0-1) ASB006(0-1) ASB006(5-6) ASB007(0-1) ASB007(5-6) ASB008(0-1) ASB008(5-6) ASB009(0-1) ASB009(5-6) ASB010(0-1) ASB010(5-6) ASBDUP001(0-1)	Di-n-butylphthalate	J	MS rec. > UCL; MS/MSD RPD > CL; Field dup. RPD > CL
PCBs			
ASB003(0-1)	Aroclor-1254	J	Result > calibration range
Metals			
ASB006(5-6) ASB008(5-6) ASB010(5-6)	Mercury	J	< RL
ASB003(0-1) ASB005(0-1) ASB006(0-1) ASB006(5-6) ASB007(0-1) ASB007(5-6) ASB008(0-1) ASB008(5-6) ASB009(0-1) ASB009(5-6) ASB010(0-1) ASB010(5-6) ASBDUP001(0-1)	Beryllium	J	< RL
ASB003(0-1) ASB005(0-1) ASB007(0-1) ASBDUP001(0-1)	Cadmium	J	< RL
ASB006(0-1) ASB007(0-1) ASB008(5-6)	Calcium	J	< RL

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Sample ID	Analyte(s)	Qualifier	Reason(s)
ASB008(0-1) ASB010(0-1)	Cobalt	J	< RL
ASB007(0-1) ASB007(5-6)	Magnesium	J	< RL
ASB007(0-1) ASB010(0-1)	Potassium	J	< RL
ASB008(0-1) ASBDUP001(0-1)	Selenium	J	< RL
ASB009(0-1)	Sodium	J	< RL

Qualifier Definitions:

J – Result is considered to be estimated at the value reported.

UJ – Result is considered not detected but estimated due to QC deficiencies.

%R - percent recovery RPD - relative percent difference %D - percent difference

LCL- lower control limit CL – control limit

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Analytical data was evaluated in accordance with applicable USEPA SW-846 method requirements, "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (July 2002), "USEPA Region III National Functional Guidelines for Organic Data Review" (September 1994), "USEPA Region III National Functional Guidelines for Inorganic Data Review" (June 1995), site-specific requirements defined in *Radford Master Work Plan* (URS, 2003), and site-specific requirements defined in the *Quality Assurance Plan Addendum* (Arcadis, 2008). The validation presented in this review was performed at the RAAP defined Level I.

The data review summarized in this report includes a review of all sample collection documentation and the electronic data validation of the analytical data housed in the project database. Sample collection documentation included sample collection logs and chains of custody. The electronic data validation was performed utilizing the EQuIS Data Qualification Module (DQM). DQM checks for the following parameters:

- Holding times and preservation;
- Blank contamination;
    1. Method blanks,
    2. Trip blanks,
    3. Equipment blanks;
- Matrix spike and Duplicate sample recovery;
- Matrix Spike and Matrix Spike Duplicate relative percent differences;
- Laboratory Control Sample and Duplicate recovery;
- Laboratory Control Sample and Duplicate relative percent differences;
- Surrogate recovery (organic analyses only); and
- Field duplicate relative percent difference.

Manually review was performed on the following items:

- Sample dilutions and reporting limits;
- Case Narratives; and
- Total versus dissolved metals concentrations.

Reviewed data was generated by Empirical Laboratories. Data qualifiers were applied electronically to the database with any additional qualifiers added manually. A summary of the data as amended by data qualifiers is included with the original hard copy reports. The attached table summarizes the data that were qualified due to QC deficiencies. The table indicates compounds/analytes qualified based on electronic and manual validation. Refer to the associated method section of the validation checklist for a detailed explanation of qualification. All other data in this SDG are considered usable as reported.

The following list of data qualifiers and definitions were applied in accordance with qualification criteria defined in the above guidance documents:

UB Compound/analyte detected in blank or associated blank, qualified as a non-detect at listed value.

J The analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reporting limit; however, the reported quantitation limit is approximate and may, or may not represent the actual limit of quantitation necessary to accurately and precisely measure analyte in the sample.

R The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria; and the presence or absence of the analyte cannot be verified.

DQM RUN BY:	Rachelle Borne	07/31/09
REVIEW PERFORMED BY:	Rachelle Borne	07/31/09
SIGNATURE:		07/31/09
PEER REVIEW:	Dennis Dyke	07/31/09

The following samples were included in this SDG:

SDG	Sample ID	Sample Date	Parent sample
0907062	1549HP010(20-30)(070809)	07/08/09	
0907062	1549HP009(19-29)(070809)	07/08/09	
0907062	1549HP020(25-30)(070809)	07/08/09	
0907062	1549HP021(21-26)(070809)	07/08/09	
0907062	1041HPDUP002(21-36)(070809)	07/08/09	1549HP021(21-26)(070809)

DATA PACKAGE DOCUMENTATION

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sampling dates noted		X		X	
2. Sampling team indicated		X		X	
3. Sampling identification traceable to location collected		X		X	
4. Sample location		X		X	
5. Sample depth for water		X		X	
6. Collection technique (bailer, pump, etc.)		X		X	
7. Sample container type		X		X	
8. Preservation methods		X		X	
9. Chain-of-custody form completed		X		X	
10. Required analytical methods requested		X		X	
11. Field (water and soil) sample logs completed properly		X		X	
12. Number and type of field QC samples collected (blanks, replicates, splits, etc.)		X		X	
13. Sample shipping		X		X	
14. Laboratory task order		X		X	

Field sampling logs = water and/or soil/sediment sampling logs QC - quality control

Comments:
All field documentation (Water Sampling Logs, Field Instrument Calibration, and Daily Logs) were reviewed for the above referenced sampling event.

METALS

Items Reviewed	DQM Deficiency		Qualification Applied	
	No	Yes	No	Yes
1. Holding times	DQM		DQM	
2. Reporting limits	M		M	
3. Blanks				
A. Method blanks		DQM		DQM
B. Equipment blanks	NA		NA	
5. Laboratory control sample (LCS)				
A. LCS accuracy (%R)	DQM		DQM	
B. LCS duplicate (LCSD) %R	NA		NA	
C. LCS/LCSD precision (RPD)	NA		NA	
6. Matrix spike				
A. Matrix spike (MS) %R	NA		NA	
B. Matrix spike duplicate (MSD) %R	NA		NA	
C. MS/MSD RPD	NA		NA	
7. Total vs. dissolved	M		M	
8. Field duplicate sample RPD	DQM		DQM	

M – Manual Review %R - percent recovery RPD - relative percent difference DQM – Data Qualification Module

Comments:
This section presents a discussion of any additions or changes to the electronic data validation for compounds analyzed utilizing Methods 6010B and 7470A.

Note: The case narrative noted that the recovery of calcium was above the control limit in the ICV for the soluble samples. All detections of calcium are qualified as estimated.

The case narrative noted that the CCV recoveries were above the control limit for calcium and iron for the soluble samples. All detections of calcium are qualified as estimated. The associated samples were non-detect for iron. Therefore, no qualification is warranted.

The case narrative noted that the CCV recoveries were above the control limit for calcium, manganese, sodium, and silver for the total samples. All detections of calcium, manganese and sodium are qualified as estimated. The associated samples were non-detect for silver. Therefore, no qualification is warranted.

3A. Zinc and cadmium were detected in the method blank. The associated field samples are qualified as non-detect for these compounds if the sample concentration is less than ten times the blank value. See the qualification summary for details of the qualifications.

8. 1041HPDUP002(21-26)(070809) was collected as a field duplicate of 1041HP021(21-26) (070809). The RPDs were acceptable at less than 40%.

DATA VALIDATION QUALIFICATION SUMMARY

Sample ID	Parameter	Result	Units	Qualifier	Reason
1549HP010(20-30)(070809)	Calcium(T)	212000	ug/L	J	CCV Recovery
	Manganese(T)	69100	ug/L	J	CCV Recovery
	Sodium(T)	13300	ug/L	J	CCV Recovery
	Calcium(D)	71100	ug/L	J	ICV Recovery
	Zinc(D)	8.4	ug/L	UB	Blank Contamination
1549HP009(19-29)(070809)	Calcium(T)	530000	ug/L	J	CCV Recovery
	Manganese(T)	95700	ug/L	J	CCV Recovery
	Sodium(T)	30200	ug/L	J	CCV Recovery
	Calcium(D)	60200	ug/L	J	ICV Recovery
1549HP020(25-30)(070809)	Cadmium(T)	10.2	ug/L	UB	Blank Contamination
	Calcium(T)	67200	ug/L	J	CCV Recovery
	Manganese(T)	57800	ug/L	J	CCV Recovery
	Sodium(T)	20700	ug/L	J	CCV Recovery
	Calcium(D)	18800	ug/L	J	ICV Recovery
	Iron(D)	82600	ug/L	J	ICV Recovery
	Zinc(D)	61.3	ug/L	UB	Blank Contamination
1549HP021(21-26)(070809)	Calcium(T)	348000	ug/L	J	CCV Recovery
	Manganese(T)	41300	ug/L	J	CCV Recovery
	Sodium(T)	15500	ug/L	J	CCV Recovery
	Calcium(D)	20900	ug/L	J	ICV Recovery
1041HPDUP002(21-36)(070809)	Calcium(T)	317000	ug/L	J	CCV Recovery
	Manganese(T)	37800	ug/L	J	CCV Recovery
	Sodium(T)	16000	ug/L	J	CCV Recovery
1041HPDUP002(21-36)(070809)	Calcium(D)	20600	ug/L	J	ICV Recovery

Qualifier Definitions:

J – Result is considered to be estimated at the value reported.
UJ – Result is considered not detected but estimated due to QC deficiencies.
UB – Non-detect at the Reporting Limit or at the concentration reported if greater than the RL due to associated blank contamination.
R – Result is qualified as unusable, data point is rejected.

Explanation/Notes:

AN ENVIRONMENTAL ANALYTICAL LABORATORY

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This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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(916) 985-1000 .FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific

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WORK ORDER #: 0805175

Work Order Summary

CLIENT:	Mr. Jaceque Powell ARCADIS, Inc. 11490 Westheimer, Suite 600 Houston, TX 77077	**BILL TO:**	Ms. Joyce Williams ARCADIS, Inc. 630 Plaza Drive Suite 100 Highlands Ranch, CO 80129
PHONE:	(281)-497-6900	**P.O. #**	GP 08RAAP.0047
FAX:	(281) 496-2936	**PROJECT #**	RAAP
DATE RECEIVED:	05/08/2008	**CONTACT:**	Brandon Dunmore
DATE COMPLETED:	05/08/2008		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	1041SLB00A(050608)	Modified TO-15	7.5"Hg	5 psi
02A	1549SLB00A(050608)	Modified TO-15	12.5"Hg	5 psi
03A	1549SG004(050708)	Modified TO-15	9.5"Hg	15 psi
03AA	1549SG004(050708) Lab Duplicate	Modified TO-15	9.5"Hg	15 psi
04A	1549SG006(050708)	Modified TO-15	7.0"Hg	15 psi
05A	1549SG003(050708)	Modified TO-15	6.0"Hg	15 psi
06A	1549Dup001(050708)	Modified TO-15	8.5"Hg	15 psi
07A	1549SG008(050708)	Modified TO-15	7.5"Hg	15 psi
08A	Lab Blank	Modified TO-15	NA	NA
08B	Lab Blank	Modified TO-15	NA	NA
09A	CCV	Modified TO-15	NA	NA
09B	CCV	Modified TO-15	NA	NA
10A	LCS	Modified TO-15	NA	NA
10B	LCS	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 05/09/08

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
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LABORATORY NARRATIVE
Modified TO-15
ARCADIS, Inc.
Workorder# 0805175

Two 6 Liter Summa Canister and five 1 Liter Summa Canister samples were received on May 08, 2008. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 0.2 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Daily CCV	+- 30% Difference	</= 30% Difference with two allowed out up to </=40%.; flag and narrate outliers
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

All Quality Control Limit failures and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

The per analytical batch duplicate analysis required for this project is associated with work order 0805177.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1041SLB00A(050608)

Lab ID#: 0805175-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.90	0.66 J	4.4	3.3 J
Freon 11	0.90	0.23 J	5.0	1.3 J
Ethanol	3.6	0.75 J	6.7	1.4 J
Acetone	3.6	4.1	8.5	9.8
2-Propanol	3.6	0.39 J	8.8	0.96 J
Carbon Disulfide	0.90	0.43 J	2.8	1.3 J
Methylene Chloride	0.90	0.38 J	3.1	1.3 J
2-Butanone (Methyl Ethyl Ketone)	0.90	0.51 J	2.6	1.5 J
Chloroform	0.90	34	4.4	170
1,1,1-Trichloroethane	0.90	1.2	4.9	6.8
Trichloroethene	0.90	8.6	4.8	46
Toluene	0.90	0.48 J	3.4	1.8 J
Tetrachloroethene	0.90	0.48 J	6.1	3.2 J

Client Sample ID: 1549SLB00A(050608)

Lab ID#: 0805175-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.2	0.33 J	5.7	1.6 J
Freon 11	1.2	0.33 J	6.5	1.9 J
Acetone	4.6	20	11	48
2-Propanol	4.6	0.31 J	11	0.76 J
Carbon Disulfide	1.2	0.48 J	3.6	1.5 J
Methylene Chloride	1.2	0.33 J	4.0	1.2 J
Hexane	1.2	0.79 J	4.0	2.8 J
2-Butanone (Methyl Ethyl Ketone)	1.2	1.3	3.4	4.0
Tetrahydrofuran	1.2	0.60 J	3.4	1.8 J
Cyclohexane	1.2	0.21 J	4.0	0.73 J
Benzene	1.2	0.42 J	3.7	1.3 J
Heptane	1.2	0.46 J	4.7	1.9 J
Toluene	1.2	0.65 J	4.3	2.4 J
Ethyl Benzene	1.2	1.0 J	5.0	4.4 J
m,p-Xylene	1.2	3.8	5.0	17
o-Xylene	1.2	1.8	5.0	7.7
Propylbenzene	1.2	0.22 J	5.6	1.1 J
4-Ethyltoluene	1.2	0.44 J	5.6	2.2 J
1,3,5-Trimethylbenzene	1.2	0.53 J	5.6	2.6 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1549SLB00A(050608)

Lab ID#: 0805175-02A

1,2,4-Trimethylbenzene	1.2	0.85 J	5.6	4.2 J

Client Sample ID: 1549SG004(050708)

Lab ID#: 0805175-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Chloromethane	5.9	2.0 J	12	4.2 J
1,3-Butadiene	1.5	4.6	3.3	10
Freon 11	1.5	1.2 J	8.3	7.1 J
Ethanol	5.9	48	11	90
Acetone	5.9	300	14	720
2-Propanol	5.9	6.8	14	17
Carbon Disulfide	1.5	3.0	4.6	9.3
Methylene Chloride	1.5	0.57 J	5.1	2.0 J
Hexane	1.5	8.6	5.2	30
1,1-Dichloroethane	1.5	0.49 J	6.0	2.0 J
2-Butanone (Methyl Ethyl Ketone)	1.5	30	4.4	89
cis-1,2-Dichloroethene	1.5	7.4	5.9	29
Tetrahydrofuran	1.5	1.4 J	4.4	4.1 J
1,1,1-Trichloroethane	1.5	0.57 J	8.1	3.1 J
Cyclohexane	1.5	6.3	5.1	22
Benzene	1.5	2.4	4.7	7.7
Heptane	1.5	12	6.1	50
Trichloroethene	1.5	0.66 J	8.0	3.6 J
1,4-Dioxane	5.9	1.5 J	21	5.5 J
4-Methyl-2-pentanone	1.5	2.1	6.1	8.5
Toluene	1.5	1.9	5.6	7.1
Tetrachloroethene	1.5	0.60 J	10	4.1 J
2-Hexanone	5.9	2.8 J	24	11 J
Ethyl Benzene	1.5	0.66 J	6.4	2.9 J
m,p-Xylene	1.5	1.3 J	6.4	5.8 J
o-Xylene	1.5	1.1 J	6.4	4.9 J
Styrene	1.5	0.31 J	6.3	1.3 J
Cumene	1.5	0.26 J	7.3	1.3 J
Propylbenzene	1.5	0.41 J	7.3	2.0 J
4-Ethyltoluene	1.5	1.2 J	7.3	6.0 J
1,2,4-Trimethylbenzene	1.5	1.6	7.3	7.8
1,4-Dichlorobenzene	1.5	0.42 J	8.9	2.5 J
1,2-Dichlorobenzene	1.5	1.3 J	8.9	7.9 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1549SG004(050708) Lab Duplicate

Lab ID#: 0805175-03AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Chloromethane	5.9	0.79 J	12	1.6 J
1,3-Butadiene	1.5	4.2	3.3	9.3
Freon 11	1.5	1.0 J	8.3	5.8 J
Ethanol	5.9	52	11	98
Acetone	5.9	300	14	700
2-Propanol	5.9	7.0	14	17
Carbon Disulfide	1.5	2.9	4.6	9.1
Methylene Chloride	1.5	0.68 J	5.1	2.4 J
Hexane	1.5	7.9	5.2	28
1,1-Dichloroethane	1.5	0.44 J	6.0	1.8 J
2-Butanone (Methyl Ethyl Ketone)	1.5	33	4.4	96
cis-1,2-Dichloroethene	1.5	7.3	5.9	29
Tetrahydrofuran	1.5	1.6	4.4	4.8
1,1,1-Trichloroethane	1.5	0.43 J	8.1	2.4 J
Cyclohexane	1.5	5.7	5.1	20
Benzene	1.5	2.4	4.7	7.6
Heptane	1.5	12	6.1	50
1,4-Dioxane	5.9	1.3 J	21	4.8 J
4-Methyl-2-pentanone	1.5	2.0	6.1	8.0
Toluene	1.5	1.9	5.6	7.2
Tetrachloroethene	1.5	0.38 J	10	2.6 J
2-Hexanone	5.9	2.5 J	24	10 J
Ethyl Benzene	1.5	0.62 J	6.4	2.7 J
m,p-Xylene	1.5	1.6	6.4	6.8
o-Xylene	1.5	1.2 J	6.4	5.2 J
Styrene	1.5	0.36 J	6.3	1.6 J
Propylbenzene	1.5	0.42 J	7.3	2.1 J
4-Ethyltoluene	1.5	1.2 J	7.3	5.6 J
1,2,4-Trimethylbenzene	1.5	1.6	7.3	8.1
1,2-Dichlorobenzene	1.5	1.4 J	8.9	8.2 J

Client Sample ID: 1549SG006(050708)

Lab ID#: 0805175-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.52 J	6.5	2.6 J
1,3-Butadiene	1.3	5.4	2.9	12

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1549SG006(050708)

Lab ID#: 0805175-04A

Ethanol	5.3	11	9.9	21
Acetone	5.3	210	12	500
2-Propanol	5.3	3.5 J	13	8.6 J
Carbon Disulfide	1.3	1.3	4.1	4.1
2-Butanone (Methyl Ethyl Ketone)	1.3	36	3.9	100
Tetrahydrofuran	1.3	1.3	3.9	3.9
Cyclohexane	1.3	0.44 J	4.5	1.5 J
Benzene	1.3	3.0	4.2	9.5
Heptane	1.3	4.0	5.4	16
4-Methyl-2-pentanone	1.3	2.5	5.4	10
Toluene	1.3	2.9	5.0	11
2-Hexanone	5.3	3.7 J	22	15 J
Ethyl Benzene	1.3	0.51 J	5.7	2.2 J
m,p-Xylene	1.3	0.79 J	5.7	3.4 J
o-Xylene	1.3	0.41 J	5.7	1.8 J
Styrene	1.3	0.44 J	5.6	1.9 J
4-Ethyltoluene	1.3	0.20 J	6.5	1.0 J

Client Sample ID: 1549SG003(050708)

Lab ID#: 0805175-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.61 J	6.2	3.0 J
1,3-Butadiene	1.3	5.6	2.8	12
Freon 11	1.3	0.31 J	7.1	1.7 J
Ethanol	5.1	26	9.5	49
Acetone	5.1	110	12	260
2-Propanol	5.1	1.6 J	12	4.1 J
Carbon Disulfide	1.3	0.90 J	3.9	2.8 J
Methylene Chloride	1.3	0.32 J	4.4	1.1 J
2-Butanone (Methyl Ethyl Ketone)	1.3	14	3.7	40
Cyclohexane	1.3	9.8	4.4	34
Benzene	1.3	2.5	4.0	7.9
Heptane	1.3	4.3	5.2	18
Trichloroethene	1.3	0.69 J	6.8	3.7 J
4-Methyl-2-pentanone	1.3	1.0 J	5.2	4.2 J
Toluene	1.3	2.6	4.8	9.7
Ethyl Benzene	1.3	0.87 J	5.5	3.8 J
m,p-Xylene	1.3	1.9	5.5	8.3

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1549SG003(050708)

Lab ID#: 0805175-05A

o-Xylene	1.3	1.3	5.5	5.5
Styrene	1.3	0.44 J	5.4	1.9 J
Cumene	1.3	0.22 J	6.2	1.1 J
Propylbenzene	1.3	0.29 J	6.2	1.4 J
4-Ethyltoluene	1.3	0.55 J	6.2	2.7 J
1,3,5-Trimethylbenzene	1.3	0.40 J	6.2	2.0 J
1,2,4-Trimethylbenzene	1.3	0.66 J	6.2	3.2 J

Client Sample ID: 1549Dup001(050708)

Lab ID#: 0805175-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.4	0.70 J	7.0	3.4 J
1,3-Butadiene	1.4	6.4	3.1	14
Freon 11	1.4	0.69 J	7.9	3.9 J
Ethanol	5.6	4.5 J	11	8.6 J
Acetone	5.6	60	13	140
2-Propanol	5.6	1.2 J	14	3.0 J
Carbon Disulfide	1.4	4.4	4.4	14
2-Butanone (Methyl Ethyl Ketone)	1.4	12	4.2	37
cis-1,2-Dichloroethene	1.4	0.79 J	5.6	3.1 J
Cyclohexane	1.4	0.32 J	4.8	1.1 J
Benzene	1.4	2.5	4.5	8.0
Heptane	1.4	2.0	5.8	8.1
4-Methyl-2-pentanone	1.4	0.37 J	5.8	1.5 J
Toluene	1.4	1.9	5.3	7.2
2-Hexanone	5.6	0.68 J	23	2.8 J
Ethyl Benzene	1.4	0.77 J	6.1	3.4 J
m,p-Xylene	1.4	0.59 J	6.1	2.6 J
o-Xylene	1.4	0.51 J	6.1	2.2 J
Styrene	1.4	0.30 J	6.0	1.2 J
4-Ethyltoluene	1.4	0.28 J	6.9	1.4 J
1,2,4-Trimethylbenzene	1.4	0.32 J	6.9	1.6 J

Client Sample ID: 1549SG008(050708)

Lab ID#: 0805175-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1549SG008(050708)

Lab ID#: 0805175-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.58 J	6.6	2.8 J
1,3-Butadiene	1.3	20	3.0	43
Freon 11	1.3	0.35 J	7.6	2.0 J
Ethanol	5.4	3.9 J	10	7.4 J
Acetone	5.4	110	13	260
2-Propanol	5.4	1.4 J	13	3.6 J
Carbon Disulfide	1.3	5.1	4.2	16
Methylene Chloride	1.3	0.29 J	4.7	1.0 J
Methyl tert-butyl ether	1.3	12	4.8	42
Hexane	1.3	17	4.7	61
2-Butanone (Methyl Ethyl Ketone)	1.3	21	4.0	62
Cyclohexane	1.3	16	4.6	56
2,2,4-Trimethylpentane	1.3	38	6.3	180
Benzene	1.3	11	4.3	34
Heptane	1.3	16	5.5	64
Toluene	1.3	9.9	5.1	37
Ethyl Benzene	1.3	2.2	5.8	9.8
m,p-Xylene	1.3	6.3	5.8	28
o-Xylene	1.3	6.7	5.8	29
Cumene	1.3	2.1	6.6	10
Propylbenzene	1.3	3.2	6.6	16
4-Ethyltoluene	1.3	11	6.6	54
1,3,5-Trimethylbenzene	1.3	19	6.6	94
1,2,4-Trimethylbenzene	1.3	23	6.6	110

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SLB00A(050608)

Lab ID#: 0805175-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050813**	**Date of Collection:**	**5/6/08**
Dil. Factor:	**1.79**	**Date of Analysis:**	**5/8/08 07:09 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.90	0.66 J	4.4	3.3 J
Freon 114	0.90	Not Detected	6.2	Not Detected
Chloromethane	3.6	Not Detected	7.4	Not Detected
Vinyl Chloride	0.90	Not Detected	2.3	Not Detected
1,3-Butadiene	0.90	Not Detected	2.0	Not Detected
Bromomethane	0.90	Not Detected	3.5	Not Detected
Chloroethane	0.90	Not Detected	2.4	Not Detected
Freon 11	0.90	0.23 J	5.0	1.3 J
Ethanol	3.6	0.75 J	6.7	1.4 J
Freon 113	0.90	Not Detected	6.8	Not Detected
1,1-Dichloroethene	0.90	Not Detected	3.5	Not Detected
Acetone	3.6	4.1	8.5	9.8
2-Propanol	3.6	0.39 J	8.8	0.96 J
Carbon Disulfide	0.90	0.43 J	2.8	1.3 J
3-Chloropropene	3.6	Not Detected	11	Not Detected
Methylene Chloride	0.90	0.38 J	3.1	1.3 J
Methyl tert-butyl ether	0.90	Not Detected	3.2	Not Detected
trans-1,2-Dichloroethene	0.90	Not Detected	3.5	Not Detected
Hexane	0.90	Not Detected	3.2	Not Detected
1,1-Dichloroethane	0.90	Not Detected	3.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.90	0.51 J	2.6	1.5 J
cis-1,2-Dichloroethene	0.90	Not Detected	3.5	Not Detected
Tetrahydrofuran	0.90	Not Detected	2.6	Not Detected
Chloroform	0.90	34	4.4	170
1,1,1-Trichloroethane	0.90	1.2	4.9	6.8
Cyclohexane	0.90	Not Detected	3.1	Not Detected
Carbon Tetrachloride	0.90	Not Detected	5.6	Not Detected
2,2,4-Trimethylpentane	0.90	Not Detected	4.2	Not Detected
Benzene	0.90	Not Detected	2.8	Not Detected
1,2-Dichloroethane	0.90	Not Detected	3.6	Not Detected
Heptane	0.90	Not Detected	3.7	Not Detected
Trichloroethene	0.90	8.6	4.8	46
1,2-Dichloropropane	0.90	Not Detected	4.1	Not Detected
1,4-Dioxane	3.6	Not Detected	13	Not Detected
Bromodichloromethane	0.90	Not Detected	6.0	Not Detected
cis-1,3-Dichloropropene	0.90	Not Detected	4.1	Not Detected
4-Methyl-2-pentanone	0.90	Not Detected	3.7	Not Detected
Toluene	0.90	0.48 J	3.4	1.8 J
trans-1,3-Dichloropropene	0.90	Not Detected	4.1	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SLB00A(050608)

Lab ID#: 0805175-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050813**	**Date of Collection: 5/6/08**	
Dil. Factor:	**1.79**	**Date of Analysis: 5/8/08 07:09 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.90	Not Detected	4.9	Not Detected
Tetrachloroethene	0.90	0.48 J	6.1	3.2 J
2-Hexanone	3.6	Not Detected	15	Not Detected
Dibromochloromethane	0.90	Not Detected	7.6	Not Detected
1,2-Dibromoethane (EDB)	0.90	Not Detected	6.9	Not Detected
Chlorobenzene	0.90	Not Detected	4.1	Not Detected
Ethyl Benzene	0.90	Not Detected	3.9	Not Detected
m,p-Xylene	0.90	Not Detected	3.9	Not Detected
o-Xylene	0.90	Not Detected	3.9	Not Detected
Styrene	0.90	Not Detected	3.8	Not Detected
Bromoform	0.90	Not Detected	9.2	Not Detected
Cumene	0.90	Not Detected	4.4	Not Detected
1,1,2,2-Tetrachloroethane	0.90	Not Detected	6.1	Not Detected
Propylbenzene	0.90	Not Detected	4.4	Not Detected
4-Ethyltoluene	0.90	Not Detected	4.4	Not Detected
1,3,5-Trimethylbenzene	0.90	Not Detected	4.4	Not Detected
1,2,4-Trimethylbenzene	0.90	Not Detected	4.4	Not Detected
1,3-Dichlorobenzene	0.90	Not Detected	5.4	Not Detected
1,4-Dichlorobenzene	0.90	Not Detected	5.4	Not Detected
alpha-Chlorotoluene	0.90	Not Detected	4.6	Not Detected
1,2-Dichlorobenzene	0.90	Not Detected	5.4	Not Detected
1,2,4-Trichlorobenzene	3.6	Not Detected	26	Not Detected
Hexachlorobutadiene	3.6	Not Detected	38	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	119	70-130
4-Bromofluorobenzene	103	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SLB00A(050608)

Lab ID#: 0805175-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050820**	**Date of Collection:**	**5/6/08**
Dil. Factor:	**2.30**	**Date of Analysis:**	**5/9/08 12:08 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.2	0.33 J	5.7	1.6 J
Freon 114	1.2	Not Detected	8.0	Not Detected
Chloromethane	4.6	Not Detected	9.5	Not Detected
Vinyl Chloride	1.2	Not Detected	2.9	Not Detected
1,3-Butadiene	1.2	Not Detected	2.5	Not Detected
Bromomethane	1.2	Not Detected	4.5	Not Detected
Chloroethane	1.2	Not Detected	3.0	Not Detected
Freon 11	1.2	0.33 J	6.5	1.9 J
Ethanol	4.6	Not Detected	8.7	Not Detected
Freon 113	1.2	Not Detected	8.8	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	4.6	20	11	48
2-Propanol	4.6	0.31 J	11	0.76 J
Carbon Disulfide	1.2	0.48 J	3.6	1.5 J
3-Chloropropene	4.6	Not Detected	14	Not Detected
Methylene Chloride	1.2	0.33 J	4.0	1.2 J
Methyl tert-butyl ether	1.2	Not Detected	4.1	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Hexane	1.2	0.79 J	4.0	2.8 J
1,1-Dichloroethane	1.2	Not Detected	4.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.2	1.3	3.4	4.0
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Tetrahydrofuran	1.2	0.60 J	3.4	1.8 J
Chloroform	1.2	Not Detected	5.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Cyclohexane	1.2	0.21 J	4.0	0.73 J
Carbon Tetrachloride	1.2	Not Detected	7.2	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.4	Not Detected
Benzene	1.2	0.42 J	3.7	1.3 J
1,2-Dichloroethane	1.2	Not Detected	4.6	Not Detected
Heptane	1.2	0.46 J	4.7	1.9 J
Trichloroethene	1.2	Not Detected	6.2	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.3	Not Detected
1,4-Dioxane	4.6	Not Detected	16	Not Detected
Bromodichloromethane	1.2	Not Detected	7.7	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.2	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	4.7	Not Detected
Toluene	1.2	0.65 J	4.3	2.4 J
trans-1,3-Dichloropropene	1.2	Not Detected	5.2	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SLB00A(050608)

Lab ID#: 0805175-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050820**	**Date of Collection: 5/6/08**	
Dil. Factor:	**2.30**	**Date of Analysis: 5/9/08 12:08 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	Not Detected	7.8	Not Detected
2-Hexanone	4.6	Not Detected	19	Not Detected
Dibromochloromethane	1.2	Not Detected	9.8	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	8.8	Not Detected
Chlorobenzene	1.2	Not Detected	5.3	Not Detected
Ethyl Benzene	1.2	1.0 J	5.0	4.4 J
m,p-Xylene	1.2	3.8	5.0	17
o-Xylene	1.2	1.8	5.0	7.7
Styrene	1.2	Not Detected	4.9	Not Detected
Bromoform	1.2	Not Detected	12	Not Detected
Cumene	1.2	Not Detected	5.6	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	7.9	Not Detected
Propylbenzene	1.2	0.22 J	5.6	1.1 J
4-Ethyltoluene	1.2	0.44 J	5.6	2.2 J
1,3,5-Trimethylbenzene	1.2	0.53 J	5.6	2.6 J
1,2,4-Trimethylbenzene	1.2	0.85 J	5.6	4.2 J
1,3-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.0	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,2,4-Trichlorobenzene	4.6	Not Detected	34	Not Detected
Hexachlorobutadiene	4.6	Not Detected	49	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	100	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG004(050708)

Lab ID#: 0805175-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050819**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.96**	**Date of Analysis: 5/8/08 11:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.5	Not Detected	7.3	Not Detected
Freon 114	1.5	Not Detected	10	Not Detected
Chloromethane	5.9	2.0 J	12	4.2 J
Vinyl Chloride	1.5	Not Detected	3.8	Not Detected
1,3-Butadiene	1.5	4.6	3.3	10
Bromomethane	1.5	Not Detected	5.7	Not Detected
Chloroethane	1.5	Not Detected	3.9	Not Detected
Freon 11	1.5	1.2 J	8.3	7.1 J
Ethanol	5.9	48	11	90
Freon 113	1.5	Not Detected	11	Not Detected
1,1-Dichloroethene	1.5	Not Detected	5.9	Not Detected
Acetone	5.9	300	14	720
2-Propanol	5.9	6.8	14	17
Carbon Disulfide	1.5	3.0	4.6	9.3
3-Chloropropene	5.9	Not Detected	18	Not Detected
Methylene Chloride	1.5	0.57 J	5.1	2.0 J
Methyl tert-butyl ether	1.5	Not Detected	5.3	Not Detected
trans-1,2-Dichloroethene	1.5	Not Detected	5.9	Not Detected
Hexane	1.5	8.6	5.2	30
1,1-Dichloroethane	1.5	0.49 J	6.0	2.0 J
2-Butanone (Methyl Ethyl Ketone)	1.5	30	4.4	89
cis-1,2-Dichloroethene	1.5	7.4	5.9	29
Tetrahydrofuran	1.5	1.4 J	4.4	4.1 J
Chloroform	1.5	Not Detected	7.2	Not Detected
1,1,1-Trichloroethane	1.5	0.57 J	8.1	3.1 J
Cyclohexane	1.5	6.3	5.1	22
Carbon Tetrachloride	1.5	Not Detected	9.3	Not Detected
2,2,4-Trimethylpentane	1.5	Not Detected	6.9	Not Detected
Benzene	1.5	2.4	4.7	7.7
1,2-Dichloroethane	1.5	Not Detected	6.0	Not Detected
Heptane	1.5	12	6.1	50
Trichloroethene	1.5	0.66 J	8.0	3.6 J
1,2-Dichloropropane	1.5	Not Detected	6.8	Not Detected
1,4-Dioxane	5.9	1.5 J	21	5.5 J
Bromodichloromethane	1.5	Not Detected	9.9	Not Detected
cis-1,3-Dichloropropene	1.5	Not Detected	6.7	Not Detected
4-Methyl-2-pentanone	1.5	2.1	6.1	8.5
Toluene	1.5	1.9	5.6	7.1
trans-1,3-Dichloropropene	1.5	Not Detected	6.7	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG004(050708)

Lab ID#: 0805175-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050819**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.96**	**Date of Analysis: 5/8/08 11:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.5	Not Detected	8.1	Not Detected
Tetrachloroethene	1.5	0.60 J	10	4.1 J
2-Hexanone	5.9	2.8 J	24	11 J
Dibromochloromethane	1.5	Not Detected	13	Not Detected
1,2-Dibromoethane (EDB)	1.5	Not Detected	11	Not Detected
Chlorobenzene	1.5	Not Detected	6.8	Not Detected
Ethyl Benzene	1.5	0.66 J	6.4	2.9 J
m,p-Xylene	1.5	1.3 J	6.4	5.8 J
o-Xylene	1.5	1.1 J	6.4	4.9 J
Styrene	1.5	0.31 J	6.3	1.3 J
Bromoform	1.5	Not Detected	15	Not Detected
Cumene	1.5	0.26 J	7.3	1.3 J
1,1,2,2-Tetrachloroethane	1.5	Not Detected	10	Not Detected
Propylbenzene	1.5	0.41 J	7.3	2.0 J
4-Ethyltoluene	1.5	1.2 J	7.3	6.0 J
1,3,5-Trimethylbenzene	1.5	Not Detected	7.3	Not Detected
1,2,4-Trimethylbenzene	1.5	1.6	7.3	7.8
1,3-Dichlorobenzene	1.5	Not Detected	8.9	Not Detected
1,4-Dichlorobenzene	1.5	0.42 J	8.9	2.5 J
alpha-Chlorotoluene	1.5	Not Detected	7.7	Not Detected
1,2-Dichlorobenzene	1.5	1.3 J	8.9	7.9 J
1,2,4-Trichlorobenzene	5.9	Not Detected	44	Not Detected
Hexachlorobutadiene	5.9	Not Detected	63	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	99	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG004(050708) Lab Duplicate

Lab ID#: 0805175-03AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050821**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.96**	**Date of Analysis: 5/9/08 12:44 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.5	Not Detected	7.3	Not Detected
Freon 114	1.5	Not Detected	10	Not Detected
Chloromethane	5.9	0.79 J	12	1.6 J
Vinyl Chloride	1.5	Not Detected	3.8	Not Detected
1,3-Butadiene	1.5	4.2	3.3	9.3
Bromomethane	1.5	Not Detected	5.7	Not Detected
Chloroethane	1.5	Not Detected	3.9	Not Detected
Freon 11	1.5	1.0 J	8.3	5.8 J
Ethanol	5.9	52	11	98
Freon 113	1.5	Not Detected	11	Not Detected
1,1-Dichloroethene	1.5	Not Detected	5.9	Not Detected
Acetone	5.9	300	14	700
2-Propanol	5.9	7.0	14	17
Carbon Disulfide	1.5	2.9	4.6	9.1
3-Chloropropene	5.9	Not Detected	18	Not Detected
Methylene Chloride	1.5	0.68 J	5.1	2.4 J
Methyl tert-butyl ether	1.5	Not Detected	5.3	Not Detected
trans-1,2-Dichloroethene	1.5	Not Detected	5.9	Not Detected
Hexane	1.5	7.9	5.2	28
1,1-Dichloroethane	1.5	0.44 J	6.0	1.8 J
2-Butanone (Methyl Ethyl Ketone)	1.5	33	4.4	96
cis-1,2-Dichloroethene	1.5	7.3	5.9	29
Tetrahydrofuran	1.5	1.6	4.4	4.8
Chloroform	1.5	Not Detected	7.2	Not Detected
1,1,1-Trichloroethane	1.5	0.43 J	8.1	2.4 J
Cyclohexane	1.5	5.7	5.1	20
Carbon Tetrachloride	1.5	Not Detected	9.3	Not Detected
2,2,4-Trimethylpentane	1.5	Not Detected	6.9	Not Detected
Benzene	1.5	2.4	4.7	7.6
1,2-Dichloroethane	1.5	Not Detected	6.0	Not Detected
Heptane	1.5	12	6.1	50
Trichloroethene	1.5	Not Detected	8.0	Not Detected
1,2-Dichloropropane	1.5	Not Detected	6.8	Not Detected
1,4-Dioxane	5.9	1.3 J	21	4.8 J
Bromodichloromethane	1.5	Not Detected	9.9	Not Detected
cis-1,3-Dichloropropene	1.5	Not Detected	6.7	Not Detected
4-Methyl-2-pentanone	1.5	2.0	6.1	8.0
Toluene	1.5	1.9	5.6	7.2
trans-1,3-Dichloropropene	1.5	Not Detected	6.7	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG004(050708) Lab Duplicate

Lab ID#: 0805175-03AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050821**	**Date of Collection:**	**5/7/08**
Dil. Factor:	**2.96**	**Date of Analysis:**	**5/9/08 12:44 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.5	Not Detected	8.1	Not Detected
Tetrachloroethene	1.5	0.38 J	10	2.6 J
2-Hexanone	5.9	2.5 J	24	10 J
Dibromochloromethane	1.5	Not Detected	13	Not Detected
1,2-Dibromoethane (EDB)	1.5	Not Detected	11	Not Detected
Chlorobenzene	1.5	Not Detected	6.8	Not Detected
Ethyl Benzene	1.5	0.62 J	6.4	2.7 J
m,p-Xylene	1.5	1.6	6.4	6.8
o-Xylene	1.5	1.2 J	6.4	5.2 J
Styrene	1.5	0.36 J	6.3	1.6 J
Bromoform	1.5	Not Detected	15	Not Detected
Cumene	1.5	Not Detected	7.3	Not Detected
1,1,2,2-Tetrachloroethane	1.5	Not Detected	10	Not Detected
Propylbenzene	1.5	0.42 J	7.3	2.1 J
4-Ethyltoluene	1.5	1.2 J	7.3	5.6 J
1,3,5-Trimethylbenzene	1.5	Not Detected	7.3	Not Detected
1,2,4-Trimethylbenzene	1.5	1.6	7.3	8.1
1,3-Dichlorobenzene	1.5	Not Detected	8.9	Not Detected
1,4-Dichlorobenzene	1.5	Not Detected	8.9	Not Detected
alpha-Chlorotoluene	1.5	Not Detected	7.7	Not Detected
1,2-Dichlorobenzene	1.5	1.4 J	8.9	8.2 J
1,2,4-Trichlorobenzene	5.9	Not Detected	44	Not Detected
Hexachlorobutadiene	5.9	Not Detected	63	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	98	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG006(050708)

Lab ID#: 0805175-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050815**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.64**	**Date of Analysis: 5/8/08 08:47 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.52 J	6.5	2.6 J
Freon 114	1.3	Not Detected	9.2	Not Detected
Chloromethane	5.3	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	5.4	2.9	12
Bromomethane	1.3	Not Detected	5.1	Not Detected
Chloroethane	1.3	Not Detected	3.5	Not Detected
Freon 11	1.3	Not Detected	7.4	Not Detected
Ethanol	5.3	11	9.9	21
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Acetone	5.3	210	12	500
2-Propanol	5.3	3.5 J	13	8.6 J
Carbon Disulfide	1.3	1.3	4.1	4.1
3-Chloropropene	5.3	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.6	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.8	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Hexane	1.3	Not Detected	4.6	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	36	3.9	100
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Tetrahydrofuran	1.3	1.3	3.9	3.9
Chloroform	1.3	Not Detected	6.4	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Cyclohexane	1.3	0.44 J	4.5	1.5 J
Carbon Tetrachloride	1.3	Not Detected	8.3	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.2	Not Detected
Benzene	1.3	3.0	4.2	9.5
1,2-Dichloroethane	1.3	Not Detected	5.3	Not Detected
Heptane	1.3	4.0	5.4	16
Trichloroethene	1.3	Not Detected	7.1	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.1	Not Detected
1,4-Dioxane	5.3	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	8.8	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected
4-Methyl-2-pentanone	1.3	2.5	5.4	10
Toluene	1.3	2.9	5.0	11
trans-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG006(050708)

Lab ID#: 0805175-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050815**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.64**	**Date of Analysis: 5/8/08 08:47 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Tetrachloroethene	1.3	Not Detected	9.0	Not Detected
2-Hexanone	5.3	3.7 J	22	15 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.1	Not Detected
Ethyl Benzene	1.3	0.51 J	5.7	2.2 J
m,p-Xylene	1.3	0.79 J	5.7	3.4 J
o-Xylene	1.3	0.41 J	5.7	1.8 J
Styrene	1.3	0.44 J	5.6	1.9 J
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.5	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.1	Not Detected
Propylbenzene	1.3	Not Detected	6.5	Not Detected
4-Ethyltoluene	1.3	0.20 J	6.5	1.0 J
1,3,5-Trimethylbenzene	1.3	Not Detected	6.5	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.5	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.8	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,2,4-Trichlorobenzene	5.3	Not Detected	39	Not Detected
Hexachlorobutadiene	5.3	Not Detected	56	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	119	70-130
4-Bromofluorobenzene	100	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG003(050708)

Lab ID#: 0805175-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050814**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.53**	**Date of Analysis: 5/8/08 08:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.61 J	6.2	3.0 J
Freon 114	1.3	Not Detected	8.8	Not Detected
Chloromethane	5.1	Not Detected	10	Not Detected
Vinyl Chloride	1.3	Not Detected	3.2	Not Detected
1,3-Butadiene	1.3	5.6	2.8	12
Bromomethane	1.3	Not Detected	4.9	Not Detected
Chloroethane	1.3	Not Detected	3.3	Not Detected
Freon 11	1.3	0.31 J	7.1	1.7 J
Ethanol	5.1	26	9.5	49
Freon 113	1.3	Not Detected	9.7	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Acetone	5.1	110	12	260
2-Propanol	5.1	1.6 J	12	4.1 J
Carbon Disulfide	1.3	0.90 J	3.9	2.8 J
3-Chloropropene	5.1	Not Detected	16	Not Detected
Methylene Chloride	1.3	0.32 J	4.4	1.1 J
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Hexane	1.3	Not Detected	4.4	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.1	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	14	3.7	40
cis-1,2-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.7	Not Detected
Chloroform	1.3	Not Detected	6.2	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	6.9	Not Detected
Cyclohexane	1.3	9.8	4.4	34
Carbon Tetrachloride	1.3	Not Detected	8.0	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	5.9	Not Detected
Benzene	1.3	2.5	4.0	7.9
1,2-Dichloroethane	1.3	Not Detected	5.1	Not Detected
Heptane	1.3	4.3	5.2	18
Trichloroethene	1.3	0.69 J	6.8	3.7 J
1,2-Dichloropropane	1.3	Not Detected	5.8	Not Detected
1,4-Dioxane	5.1	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.5	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.7	Not Detected
4-Methyl-2-pentanone	1.3	1.0 J	5.2	4.2 J
Toluene	1.3	2.6	4.8	9.7
trans-1,3-Dichloropropene	1.3	Not Detected	5.7	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG003(050708)

Lab ID#: 0805175-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050814**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.53**	**Date of Analysis: 5/8/08 08:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	6.9	Not Detected
Tetrachloroethene	1.3	Not Detected	8.6	Not Detected
2-Hexanone	5.1	Not Detected	21	Not Detected
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.7	Not Detected
Chlorobenzene	1.3	Not Detected	5.8	Not Detected
Ethyl Benzene	1.3	0.87 J	5.5	3.8 J
m,p-Xylene	1.3	1.9	5.5	8.3
o-Xylene	1.3	1.3	5.5	5.5
Styrene	1.3	0.44 J	5.4	1.9 J
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	0.22 J	6.2	1.1 J
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.7	Not Detected
Propylbenzene	1.3	0.29 J	6.2	1.4 J
4-Ethyltoluene	1.3	0.55 J	6.2	2.7 J
1,3,5-Trimethylbenzene	1.3	0.40 J	6.2	2.0 J
1,2,4-Trimethylbenzene	1.3	0.66 J	6.2	3.2 J
1,3-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.5	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
1,2,4-Trichlorobenzene	5.1	Not Detected	38	Not Detected
Hexachlorobutadiene	5.1	Not Detected	54	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	120	70-130
4-Bromofluorobenzene	101	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549Dup001(050708)

Lab ID#: 0805175-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050816**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.82**	**Date of Analysis: 5/8/08 09:25 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.4	0.70 J	7.0	3.4 J
Freon 114	1.4	Not Detected	9.8	Not Detected
Chloromethane	5.6	Not Detected	12	Not Detected
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,3-Butadiene	1.4	6.4	3.1	14
Bromomethane	1.4	Not Detected	5.5	Not Detected
Chloroethane	1.4	Not Detected	3.7	Not Detected
Freon 11	1.4	0.69 J	7.9	3.9 J
Ethanol	5.6	4.5 J	11	8.6 J
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Acetone	5.6	60	13	140
2-Propanol	5.6	1.2 J	14	3.0 J
Carbon Disulfide	1.4	4.4	4.4	14
3-Chloropropene	5.6	Not Detected	18	Not Detected
Methylene Chloride	1.4	Not Detected	4.9	Not Detected
Methyl tert-butyl ether	1.4	Not Detected	5.1	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Hexane	1.4	Not Detected	5.0	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.4	12	4.2	37
cis-1,2-Dichloroethene	1.4	0.79 J	5.6	3.1 J
Tetrahydrofuran	1.4	Not Detected	4.2	Not Detected
Chloroform	1.4	Not Detected	6.9	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Cyclohexane	1.4	0.32 J	4.8	1.1 J
Carbon Tetrachloride	1.4	Not Detected	8.9	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.6	Not Detected
Benzene	1.4	2.5	4.5	8.0
1,2-Dichloroethane	1.4	Not Detected	5.7	Not Detected
Heptane	1.4	2.0	5.8	8.1
Trichloroethene	1.4	Not Detected	7.6	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.5	Not Detected
1,4-Dioxane	5.6	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.4	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected
4-Methyl-2-pentanone	1.4	0.37 J	5.8	1.5 J
Toluene	1.4	1.9	5.3	7.2
trans-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549Dup001(050708)

Lab ID#: 0805175-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050816**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.82**	**Date of Analysis: 5/8/08 09:25 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Tetrachloroethene	1.4	Not Detected	9.6	Not Detected
2-Hexanone	5.6	0.68 J	23	2.8 J
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.5	Not Detected
Ethyl Benzene	1.4	0.77 J	6.1	3.4 J
m,p-Xylene	1.4	0.59 J	6.1	2.6 J
o-Xylene	1.4	0.51 J	6.1	2.2 J
Styrene	1.4	0.30 J	6.0	1.2 J
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.9	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.7	Not Detected
Propylbenzene	1.4	Not Detected	6.9	Not Detected
4-Ethyltoluene	1.4	0.28 J	6.9	1.4 J
1,3,5-Trimethylbenzene	1.4	Not Detected	6.9	Not Detected
1,2,4-Trimethylbenzene	1.4	0.32 J	6.9	1.6 J
1,3-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
1,2,4-Trichlorobenzene	5.6	Not Detected	42	Not Detected
Hexachlorobutadiene	5.6	Not Detected	60	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	95	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG008(050708)

Lab ID#: 0805175-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050817**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.69**	**Date of Analysis: 5/8/08 10:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.58 J	6.6	2.8 J
Freon 114	1.3	Not Detected	9.4	Not Detected
Chloromethane	5.4	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	20	3.0	43
Bromomethane	1.3	Not Detected	5.2	Not Detected
Chloroethane	1.3	Not Detected	3.5	Not Detected
Freon 11	1.3	0.35 J	7.6	2.0 J
Ethanol	5.4	3.9 J	10	7.4 J
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Acetone	5.4	110	13	260
2-Propanol	5.4	1.4 J	13	3.6 J
Carbon Disulfide	1.3	5.1	4.2	16
3-Chloropropene	5.4	Not Detected	17	Not Detected
Methylene Chloride	1.3	0.29 J	4.7	1.0 J
Methyl tert-butyl ether	1.3	12	4.8	42
trans-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Hexane	1.3	17	4.7	61
1,1-Dichloroethane	1.3	Not Detected	5.4	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	21	4.0	62
cis-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Tetrahydrofuran	1.3	Not Detected	4.0	Not Detected
Chloroform	1.3	Not Detected	6.6	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Cyclohexane	1.3	16	4.6	56
Carbon Tetrachloride	1.3	Not Detected	8.5	Not Detected
2,2,4-Trimethylpentane	1.3	38	6.3	180
Benzene	1.3	11	4.3	34
1,2-Dichloroethane	1.3	Not Detected	5.4	Not Detected
Heptane	1.3	16	5.5	64
Trichloroethene	1.3	Not Detected	7.2	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.2	Not Detected
1,4-Dioxane	5.4	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	9.0	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.5	Not Detected
Toluene	1.3	9.9	5.1	37
trans-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG008(050708)

Lab ID#: 0805175-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050817**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.69**	**Date of Analysis: 5/8/08 10:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Tetrachloroethene	1.3	Not Detected	9.1	Not Detected
2-Hexanone	5.4	Not Detected	22	Not Detected
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.2	Not Detected
Ethyl Benzene	1.3	2.2	5.8	9.8
m,p-Xylene	1.3	6.3	5.8	28
o-Xylene	1.3	6.7	5.8	29
Styrene	1.3	Not Detected	5.7	Not Detected
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	2.1	6.6	10
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.2	Not Detected
Propylbenzene	1.3	3.2	6.6	16
4-Ethyltoluene	1.3	11	6.6	54
1,3,5-Trimethylbenzene	1.3	19	6.6	94
1,2,4-Trimethylbenzene	1.3	23	6.6	110
1,3-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	7.0	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
1,2,4-Trichlorobenzene	5.4	Not Detected	40	Not Detected
Hexachlorobutadiene	5.4	Not Detected	57	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	101	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805175-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050804a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 02:15 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	0.72 J	4.8	1.7 J
2-Propanol	2.0	0.15 J	4.9	0.38 J
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	0.17 J	1.7	0.60 J
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	0.22 J	1.5	0.65 J
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	0.31 J	1.5	0.92 J
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805175-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050804a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 02:15 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	0.13 J	3.8	1.0 J
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	0.11 J	2.1	0.48 J
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	0.073 J	2.4	0.36 J
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	0.14 J	3.0	0.84 J
1,4-Dichlorobenzene	0.50	0.20 J	3.0	1.2 J
alpha-Chlorotoluene	0.50	0.25 J	2.6	1.3 J
1,2-Dichlorobenzene	0.50	0.16 J	3.0	0.93 J
1,2,4-Trichlorobenzene	2.0	0.78 J	15	5.8 J
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	96	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805175-08B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050805a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 12:03 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	Not Detected	1.5	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805175-08B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050805a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 12:03 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	0.060 J	2.6	0.31 J
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	103	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805175-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 12:58 PM**	

Compound	%Recovery
Freon 12	122
Freon 114	115
Chloromethane	123
Vinyl Chloride	118
1,3-Butadiene	111
Bromomethane	135 Q
Chloroethane	120
Freon 11	108
Ethanol	127
Freon 113	104
1,1-Dichloroethene	106
Acetone	110
2-Propanol	116
Carbon Disulfide	112
3-Chloropropene	113
Methylene Chloride	104
Methyl tert-butyl ether	91
trans-1,2-Dichloroethene	101
Hexane	105
1,1-Dichloroethane	114
2-Butanone (Methyl Ethyl Ketone)	103
cis-1,2-Dichloroethene	105
Tetrahydrofuran	91
Chloroform	105
1,1,1-Trichloroethane	105
Cyclohexane	99
Carbon Tetrachloride	99
2,2,4-Trimethylpentane	105
Benzene	99
1,2-Dichloroethane	100
Heptane	103
Trichloroethene	99
1,2-Dichloropropane	103
1,4-Dioxane	104
Bromodichloromethane	101
cis-1,3-Dichloropropene	102
4-Methyl-2-pentanone	99
Toluene	98
trans-1,3-Dichloropropene	98

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805175-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 12:58 PM**	

Compound	%Recovery
1,1,2-Trichloroethane	94
Tetrachloroethene	90
2-Hexanone	106
Dibromochloromethane	93
1,2-Dibromoethane (EDB)	96
Chlorobenzene	93
Ethyl Benzene	100
m,p-Xylene	94
o-Xylene	93
Styrene	95
Bromoform	96
Cumene	96
1,1,2,2-Tetrachloroethane	103
Propylbenzene	100
4-Ethyltoluene	96
1,3,5-Trimethylbenzene	101
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	97
1,4-Dichlorobenzene	98
alpha-Chlorotoluene	102
1,2-Dichlorobenzene	94
1,2,4-Trichlorobenzene	85
Hexachlorobutadiene	81

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	102	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805175-09B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 09:11 AM**	

Compound	%Recovery
Freon 12	108
Freon 114	111
Chloromethane	120
Vinyl Chloride	97
1,3-Butadiene	98
Bromomethane	97
Chloroethane	77
Freon 11	106
Ethanol	79
Freon 113	96
1,1-Dichloroethene	90
Acetone	78
2-Propanol	83
Carbon Disulfide	79
3-Chloropropene	75
Methylene Chloride	88
Methyl tert-butyl ether	79
trans-1,2-Dichloroethene	82
Hexane	78
1,1-Dichloroethane	86
2-Butanone (Methyl Ethyl Ketone)	84
cis-1,2-Dichloroethene	96
Tetrahydrofuran	91
Chloroform	103
1,1,1-Trichloroethane	111
Cyclohexane	86
Carbon Tetrachloride	120
2,2,4-Trimethylpentane	95
Benzene	101
1,2-Dichloroethane	131 Q
Heptane	102
Trichloroethene	106
1,2-Dichloropropane	104
1,4-Dioxane	101
Bromodichloromethane	123
cis-1,3-Dichloropropene	110
4-Methyl-2-pentanone	109
Toluene	100
trans-1,3-Dichloropropene	119

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805175-09B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 09:11 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	102
Tetrachloroethene	111
2-Hexanone	109
Dibromochloromethane	126
1,2-Dibromoethane (EDB)	116
Chlorobenzene	105
Ethyl Benzene	100
m,p-Xylene	100
o-Xylene	100
Styrene	103
Bromoform	133 Q
Cumene	99
1,1,2,2-Tetrachloroethane	109
Propylbenzene	103
4-Ethyltoluene	105
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	99
1,3-Dichlorobenzene	109
1,4-Dichlorobenzene	111
alpha-Chlorotoluene	125
1,2-Dichlorobenzene	107
1,2,4-Trichlorobenzene	100
Hexachlorobutadiene	91

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	123	70-130
4-Bromofluorobenzene	109	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805175-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 01:32 PM**	

Compound	%Recovery
Freon 12	112
Freon 114	104
Chloromethane	110
Vinyl Chloride	106
1,3-Butadiene	100
Bromomethane	125
Chloroethane	115
Freon 11	108
Ethanol	130
Freon 113	117
1,1-Dichloroethene	116
Acetone	113
2-Propanol	121
Carbon Disulfide	112
3-Chloropropene	119
Methylene Chloride	113
Methyl tert-butyl ether	107
trans-1,2-Dichloroethene	107
Hexane	109
1,1-Dichloroethane	124
2-Butanone (Methyl Ethyl Ketone)	107
cis-1,2-Dichloroethene	111
Tetrahydrofuran	92
Chloroform	110
1,1,1-Trichloroethane	112
Cyclohexane	101
Carbon Tetrachloride	105
2,2,4-Trimethylpentane	111
Benzene	111
1,2-Dichloroethane	115
Heptane	118
Trichloroethene	113
1,2-Dichloropropane	114
1,4-Dioxane	118
Bromodichloromethane	115
cis-1,3-Dichloropropene	115
4-Methyl-2-pentanone	114
Toluene	116
trans-1,3-Dichloropropene	107

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805175-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1050803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 01:32 PM**	

Compound	**%Recovery**
1,1,2-Trichloroethane	104
Tetrachloroethene	99
2-Hexanone	113
Dibromochloromethane	103
1,2-Dibromoethane (EDB)	101
Chlorobenzene	101
Ethyl Benzene	106
m,p-Xylene	101
o-Xylene	99
Styrene	104
Bromoform	105
Cumene	105
1,1,2,2-Tetrachloroethane	111
Propylbenzene	110
4-Ethyltoluene	104
1,3,5-Trimethylbenzene	106
1,2,4-Trimethylbenzene	98
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	100
alpha-Chlorotoluene	109
1,2-Dichlorobenzene	96
1,2,4-Trichlorobenzene	85
Hexachlorobutadiene	77

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	96	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805175-10B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 10:04 AM**	

Compound	%Recovery
Freon 12	109
Freon 114	107
Chloromethane	126
Vinyl Chloride	104
1,3-Butadiene	104
Bromomethane	106
Chloroethane	89
Freon 11	110
Ethanol	94
Freon 113	112
1,1-Dichloroethene	111
Acetone	87
2-Propanol	95
Carbon Disulfide	90
3-Chloropropene	84
Methylene Chloride	104
Methyl tert-butyl ether	88
trans-1,2-Dichloroethene	89
Hexane	89
1,1-Dichloroethane	98
2-Butanone (Methyl Ethyl Ketone)	94
cis-1,2-Dichloroethene	105
Tetrahydrofuran	98
Chloroform	110
1,1,1-Trichloroethane	113
Cyclohexane	93
Carbon Tetrachloride	121
2,2,4-Trimethylpentane	101
Benzene	106
1,2-Dichloroethane	133 Q
Heptane	107
Trichloroethene	110
1,2-Dichloropropane	110
1,4-Dioxane	101
Bromodichloromethane	124
cis-1,3-Dichloropropene	113
4-Methyl-2-pentanone	114
Toluene	106
trans-1,3-Dichloropropene	122

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805175-10B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 10:04 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	103
Tetrachloroethene	112
2-Hexanone	113
Dibromochloromethane	126
1,2-Dibromoethane (EDB)	114
Chlorobenzene	106
Ethyl Benzene	101
m,p-Xylene	100
o-Xylene	102
Styrene	104
Bromoform	134
Cumene	103
1,1,2,2-Tetrachloroethane	112
Propylbenzene	107
4-Ethyltoluene	108
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	99
1,3-Dichlorobenzene	110
1,4-Dichlorobenzene	110
alpha-Chlorotoluene	129
1,2-Dichlorobenzene	108
1,2,4-Trichlorobenzene	106
Hexachlorobutadiene	94

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	108	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

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- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0805177

Work Order Summary

CLIENT:	Mr. Jaceque Powell ARCADIS, Inc. 11490 Westheimer, Suite 600 Houston, TX 77077	**BILL TO:**	Ms. Joyce Williams ARCADIS, Inc. 630 Plaza Drive Suite 100 Highlands Ranch, CO 80129
PHONE:	(281)-497-6900	**P.O. #**	GP 08RAAP.0047
FAX:	(281) 496-2936	**PROJECT #**	RAAP
DATE RECEIVED:	05/08/2008	**CONTACT:**	Brandon Dunmore
DATE COMPLETED:	05/09/2008		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
08A	1549SG007(050708)	Modified TO-15	9.0 "Hg	15 psi
08AA	1549SG007(050708) Lab Duplicate	Modified TO-15	9.0 "Hg	15 psi
09A	1549SG001(050708)	Modified TO-15	6.5 "Hg	15 psi
10A	Lab Blank	Modified TO-15	NA	NA
11A	CCV	Modified TO-15	NA	NA
12A	LCS	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Fruman DATE: 05/09/08

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified TO-15
ARCADIS, Inc.
Workorder# 0805177

Two 1 Liter Summa Canister samples were received on May 08, 2008. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 0.2 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Daily CCV	+- 30% Difference	</= 30% Difference with two allowed out up to </=40%.; flag and narrate outliers
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

All Quality Control Limit failures and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction no

performed).

J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1549SG007(050708)

Lab ID#: 0805177-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	1.4	6.1	3.2	14
Freon 11	1.4	0.80 J	8.1	4.5 J
Ethanol	5.8	3.2 J	11	6.1 J
Acetone	5.8	53	14	120
Carbon Disulfide	1.4	3.8	4.5	12
2-Butanone (Methyl Ethyl Ketone)	1.4	11	4.3	33
Cyclohexane	1.4	0.42 J	5.0	1.4 J
Benzene	1.4	2.6	4.6	8.2
Heptane	1.4	1.6	5.9	6.8
4-Methyl-2-pentanone	1.4	0.50 J	5.9	2.1 J
Toluene	1.4	1.8	5.4	6.9
2-Hexanone	5.8	0.56 J	24	2.3 J
Ethyl Benzene	1.4	0.75 J	6.3	3.2 J
m,p-Xylene	1.4	0.68 J	6.3	3.0 J
o-Xylene	1.4	0.44 J	6.3	1.9 J
Styrene	1.4	0.32 J	6.2	1.4 J
Cumene	1.4	0.21 J	7.1	1.0 J
4-Ethyltoluene	1.4	0.32 J	7.1	1.6 J
1,2,4-Trimethylbenzene	1.4	0.31 J	7.1	1.5 J

Client Sample ID: 1549SG007(050708) Lab Duplicate

Lab ID#: 0805177-08AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	1.4	5.4	3.2	12
Freon 11	1.4	0.78 J	8.1	4.4 J
Ethanol	5.8	2.6 J	11	5.0 J
Acetone	5.8	46	14	110
Carbon Disulfide	1.4	3.4	4.5	11
2-Butanone (Methyl Ethyl Ketone)	1.4	9.9	4.3	29
Cyclohexane	1.4	0.34 J	5.0	1.2 J
Benzene	1.4	2.3	4.6	7.4
Heptane	1.4	1.3 J	5.9	5.4 J
4-Methyl-2-pentanone	1.4	0.40 J	5.9	1.6 J
Toluene	1.4	1.7	5.4	6.4
Tetrachloroethene	1.4	0.43 J	9.8	2.9 J
2-Hexanone	5.8	0.62 J	24	2.5 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1549SG007(050708) Lab Duplicate

Lab ID#: 0805177-08AA

Ethyl Benzene	1.4	0.62 J	6.3	2.7 J
m,p-Xylene	1.4	0.60 J	6.3	2.6 J
o-Xylene	1.4	0.36 J	6.3	1.6 J
Styrene	1.4	0.30 J	6.2	1.3 J
4-Ethyltoluene	1.4	0.31 J	7.1	1.5 J
1,2,4-Trimethylbenzene	1.4	0.31 J	7.1	1.5 J

Client Sample ID: 1549SG001(050708)

Lab ID#: 0805177-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	1.3	4.5	2.8	10
Freon 11	1.3	0.27 J	7.2	1.5 J
Ethanol	5.2	65	9.7	120
Acetone	5.2	160	12	370
Carbon Disulfide	1.3	0.63 J	4.0	2.0 J
2-Butanone (Methyl Ethyl Ketone)	1.3	28	3.8	82
Tetrahydrofuran	1.3	5.1	3.8	15
Benzene	1.3	1.8	4.1	5.8
Heptane	1.3	1.3	5.3	5.2 J
4-Methyl-2-pentanone	1.3	1.2 J	5.3	4.8 J
Toluene	1.3	1.1 J	4.9	4.1 J
2-Hexanone	5.2	1.7 J	21	6.8 J
m,p-Xylene	1.3	0.31 J	5.6	1.3 J
o-Xylene	1.3	0.16 J	5.6	0.70 J
Styrene	1.3	0.19 J	5.5	0.82 J
1,2,4-Trimethylbenzene	1.3	0.24 J	6.3	1.2 J
1,3-Dichlorobenzene	1.3	0.14 J	7.8	0.87 J
1,4-Dichlorobenzene	1.3	0.53 J	7.8	3.2 J
1,2-Dichlorobenzene	1.3	0.90 J	7.8	5.4 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG007(050708)

Lab ID#: 0805177-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050811**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.89**	**Date of Analysis: 5/8/08 05:52 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.4	Not Detected	7.1	Not Detected
Freon 114	1.4	Not Detected	10	Not Detected
Chloromethane	5.8	Not Detected	12	Not Detected
Vinyl Chloride	1.4	Not Detected	3.7	Not Detected
1,3-Butadiene	1.4	6.1	3.2	14
Bromomethane	1.4	Not Detected	5.6	Not Detected
Chloroethane	1.4	Not Detected	3.8	Not Detected
Freon 11	1.4	0.80 J	8.1	4.5 J
Ethanol	5.8	3.2 J	11	6.1 J
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Acetone	5.8	53	14	120
2-Propanol	5.8	Not Detected	14	Not Detected
Carbon Disulfide	1.4	3.8	4.5	12
3-Chloropropene	5.8	Not Detected	18	Not Detected
Methylene Chloride	1.4	Not Detected	5.0	Not Detected
Methyl tert-butyl ether	1.4	Not Detected	5.2	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Hexane	1.4	Not Detected	5.1	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.4	11	4.3	33
cis-1,2-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.3	Not Detected
Chloroform	1.4	Not Detected	7.0	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.9	Not Detected
Cyclohexane	1.4	0.42 J	5.0	1.4 J
Carbon Tetrachloride	1.4	Not Detected	9.1	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.8	Not Detected
Benzene	1.4	2.6	4.6	8.2
1,2-Dichloroethane	1.4	Not Detected	5.8	Not Detected
Heptane	1.4	1.6	5.9	6.8
Trichloroethene	1.4	Not Detected	7.8	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.7	Not Detected
1,4-Dioxane	5.8	Not Detected	21	Not Detected
Bromodichloromethane	1.4	Not Detected	9.7	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.6	Not Detected
4-Methyl-2-pentanone	1.4	0.50 J	5.9	2.1 J
Toluene	1.4	1.8	5.4	6.9
trans-1,3-Dichloropropene	1.4	Not Detected	6.6	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG007(050708)

Lab ID#: 0805177-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050811**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.89**	**Date of Analysis: 5/8/08 05:52 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.4	Not Detected	7.9	Not Detected
Tetrachloroethene	1.4	Not Detected	9.8	Not Detected
2-Hexanone	5.8	0.56 J	24	2.3 J
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.6	Not Detected
Ethyl Benzene	1.4	0.75 J	6.3	3.2 J
m,p-Xylene	1.4	0.68 J	6.3	3.0 J
o-Xylene	1.4	0.44 J	6.3	1.9 J
Styrene	1.4	0.32 J	6.2	1.4 J
Bromoform	1.4	Not Detected	15	Not Detected
Cumene	1.4	0.21 J	7.1	1.0 J
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.9	Not Detected
Propylbenzene	1.4	Not Detected	7.1	Not Detected
4-Ethyltoluene	1.4	0.32 J	7.1	1.6 J
1,3,5-Trimethylbenzene	1.4	Not Detected	7.1	Not Detected
1,2,4-Trimethylbenzene	1.4	0.31 J	7.1	1.5 J
1,3-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.5	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
1,2,4-Trichlorobenzene	5.8	Not Detected	43	Not Detected
Hexachlorobutadiene	5.8	Not Detected	62	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	119	70-130
4-Bromofluorobenzene	99	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG007(050708) Lab Duplicate

Lab ID#: 0805177-08AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050830**	**Date of Collection:**	**5/7/08**
Dil. Factor:	**2.89**	**Date of Analysis:**	**5/9/08 07:51 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.4	Not Detected	7.1	Not Detected
Freon 114	1.4	Not Detected	10	Not Detected
Chloromethane	5.8	Not Detected	12	Not Detected
Vinyl Chloride	1.4	Not Detected	3.7	Not Detected
1,3-Butadiene	1.4	5.4	3.2	12
Bromomethane	1.4	Not Detected	5.6	Not Detected
Chloroethane	1.4	Not Detected	3.8	Not Detected
Freon 11	1.4	0.78 J	8.1	4.4 J
Ethanol	5.8	2.6 J	11	5.0 J
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Acetone	5.8	46	14	110
2-Propanol	5.8	Not Detected	14	Not Detected
Carbon Disulfide	1.4	3.4	4.5	11
3-Chloropropene	5.8	Not Detected	18	Not Detected
Methylene Chloride	1.4	Not Detected	5.0	Not Detected
Methyl tert-butyl ether	1.4	Not Detected	5.2	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Hexane	1.4	Not Detected	5.1	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.4	9.9	4.3	29
cis-1,2-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.3	Not Detected
Chloroform	1.4	Not Detected	7.0	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.9	Not Detected
Cyclohexane	1.4	0.34 J	5.0	1.2 J
Carbon Tetrachloride	1.4	Not Detected	9.1	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.8	Not Detected
Benzene	1.4	2.3	4.6	7.4
1,2-Dichloroethane	1.4	Not Detected	5.8	Not Detected
Heptane	1.4	1.3 J	5.9	5.4 J
Trichloroethene	1.4	Not Detected	7.8	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.7	Not Detected
1,4-Dioxane	5.8	Not Detected	21	Not Detected
Bromodichloromethane	1.4	Not Detected	9.7	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.6	Not Detected
4-Methyl-2-pentanone	1.4	0.40 J	5.9	1.6 J
Toluene	1.4	1.7	5.4	6.4
trans-1,3-Dichloropropene	1.4	Not Detected	6.6	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG007(050708) Lab Duplicate

Lab ID#: 0805177-08AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050830**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.89**	**Date of Analysis: 5/9/08 07:51 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.4	Not Detected	7.9	Not Detected
Tetrachloroethene	1.4	0.43 J	9.8	2.9 J
2-Hexanone	5.8	0.62 J	24	2.5 J
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.6	Not Detected
Ethyl Benzene	1.4	0.62 J	6.3	2.7 J
m,p-Xylene	1.4	0.60 J	6.3	2.6 J
o-Xylene	1.4	0.36 J	6.3	1.6 J
Styrene	1.4	0.30 J	6.2	1.3 J
Bromoform	1.4	Not Detected	15	Not Detected
Cumene	1.4	Not Detected	7.1	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.9	Not Detected
Propylbenzene	1.4	Not Detected	7.1	Not Detected
4-Ethyltoluene	1.4	0.31 J	7.1	1.5 J
1,3,5-Trimethylbenzene	1.4	Not Detected	7.1	Not Detected
1,2,4-Trimethylbenzene	1.4	0.31 J	7.1	1.5 J
1,3-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.5	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
1,2,4-Trichlorobenzene	5.8	Not Detected	43	Not Detected
Hexachlorobutadiene	5.8	Not Detected	62	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	122	70-130
4-Bromofluorobenzene	105	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG001(050708)

Lab ID#: 0805177-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050812**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.58**	**Date of Analysis: 5/8/08 06:30 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	Not Detected	6.4	Not Detected
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	5.2	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	4.5	2.8	10
Bromomethane	1.3	Not Detected	5.0	Not Detected
Chloroethane	1.3	Not Detected	3.4	Not Detected
Freon 11	1.3	0.27 J	7.2	1.5 J
Ethanol	5.2	65	9.7	120
Freon 113	1.3	Not Detected	9.9	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	5.2	160	12	370
2-Propanol	5.2	Not Detected	13	Not Detected
Carbon Disulfide	1.3	0.63 J	4.0	2.0 J
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.5	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	Not Detected	4.5	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	28	3.8	82
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	5.1	3.8	15
Chloroform	1.3	Not Detected	6.3	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Cyclohexane	1.3	Not Detected	4.4	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.0	Not Detected
Benzene	1.3	1.8	4.1	5.8
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	1.3	5.3	5.2 J
Trichloroethene	1.3	Not Detected	6.9	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	1.2 J	5.3	4.8 J
Toluene	1.3	1.1 J	4.9	4.1 J
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1549SG001(050708)

Lab ID#: 0805177-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050812**	**Date of Collection: 5/7/08**	
Dil. Factor:	**2.58**	**Date of Analysis: 5/8/08 06:30 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	Not Detected	8.8	Not Detected
2-Hexanone	5.2	1.7 J	21	6.8 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	Not Detected	5.6	Not Detected
m,p-Xylene	1.3	0.31 J	5.6	1.3 J
o-Xylene	1.3	0.16 J	5.6	0.70 J
Styrene	1.3	0.19 J	5.5	0.82 J
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.3	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	Not Detected	6.3	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.3	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,2,4-Trimethylbenzene	1.3	0.24 J	6.3	1.2 J
1,3-Dichlorobenzene	1.3	0.14 J	7.8	0.87 J
1,4-Dichlorobenzene	1.3	0.53 J	7.8	3.2 J
alpha-Chlorotoluene	1.3	Not Detected	6.7	Not Detected
1,2-Dichlorobenzene	1.3	0.90 J	7.8	5.4 J
1,2,4-Trichlorobenzene	5.2	Not Detected	38	Not Detected
Hexachlorobutadiene	5.2	Not Detected	55	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	100	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805177-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050805a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 12:03 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	Not Detected	1.5	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805177-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050805a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 12:03 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	0.060 J	2.6	0.31 J
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	103	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805177-11A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 09:11 AM**	

Compound	%Recovery
Freon 12	108
Freon 114	111
Chloromethane	120
Vinyl Chloride	97
1,3-Butadiene	98
Bromomethane	97
Chloroethane	77
Freon 11	106
Ethanol	79
Freon 113	96
1,1-Dichloroethene	90
Acetone	78
2-Propanol	83
Carbon Disulfide	79
3-Chloropropene	75
Methylene Chloride	88
Methyl tert-butyl ether	79
trans-1,2-Dichloroethene	82
Hexane	78
1,1-Dichloroethane	86
2-Butanone (Methyl Ethyl Ketone)	84
cis-1,2-Dichloroethene	96
Tetrahydrofuran	91
Chloroform	103
1,1,1-Trichloroethane	111
Cyclohexane	86
Carbon Tetrachloride	120
2,2,4-Trimethylpentane	95
Benzene	101
1,2-Dichloroethane	131 Q
Heptane	102
Trichloroethene	106
1,2-Dichloropropane	104
1,4-Dioxane	101
Bromodichloromethane	123
cis-1,3-Dichloropropene	110
4-Methyl-2-pentanone	109
Toluene	100
trans-1,3-Dichloropropene	119

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805177-11A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 09:11 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	102
Tetrachloroethene	111
2-Hexanone	109
Dibromochloromethane	126
1,2-Dibromoethane (EDB)	116
Chlorobenzene	105
Ethyl Benzene	100
m,p-Xylene	100
o-Xylene	100
Styrene	103
Bromoform	133 Q
Cumene	99
1,1,2,2-Tetrachloroethane	109
Propylbenzene	103
4-Ethyltoluene	105
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	99
1,3-Dichlorobenzene	109
1,4-Dichlorobenzene	111
alpha-Chlorotoluene	125
1,2-Dichlorobenzene	107
1,2,4-Trichlorobenzene	100
Hexachlorobutadiene	91

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	123	70-130
4-Bromofluorobenzene	109	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805177-12A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 10:04 AM**	

Compound	%Recovery
Freon 12	109
Freon 114	107
Chloromethane	126
Vinyl Chloride	104
1,3-Butadiene	104
Bromomethane	106
Chloroethane	89
Freon 11	110
Ethanol	94
Freon 113	112
1,1-Dichloroethene	111
Acetone	87
2-Propanol	95
Carbon Disulfide	90
3-Chloropropene	84
Methylene Chloride	104
Methyl tert-butyl ether	88
trans-1,2-Dichloroethene	89
Hexane	89
1,1-Dichloroethane	98
2-Butanone (Methyl Ethyl Ketone)	94
cis-1,2-Dichloroethene	105
Tetrahydrofuran	98
Chloroform	110
1,1,1-Trichloroethane	113
Cyclohexane	93
Carbon Tetrachloride	121
2,2,4-Trimethylpentane	101
Benzene	106
1,2-Dichloroethane	133 Q
Heptane	107
Trichloroethene	110
1,2-Dichloropropane	110
1,4-Dioxane	101
Bromodichloromethane	124
cis-1,3-Dichloropropene	113
4-Methyl-2-pentanone	114
Toluene	106
trans-1,3-Dichloropropene	122

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Client Sample ID: LCS

Lab ID#: 0805177-12A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7050803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/8/08 10:04 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	103
Tetrachloroethene	112
2-Hexanone	113
Dibromochloromethane	126
1,2-Dibromoethane (EDB)	114
Chlorobenzene	106
Ethyl Benzene	101
m,p-Xylene	100
o-Xylene	102
Styrene	104
Bromoform	134
Cumene	103
1,1,2,2-Tetrachloroethane	112
Propylbenzene	107
4-Ethyltoluene	108
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	99
1,3-Dichlorobenzene	110
1,4-Dichlorobenzene	110
alpha-Chlorotoluene	129
1,2-Dichlorobenzene	108
1,2,4-Trichlorobenzene	106
Hexachlorobutadiene	94

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	108	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

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- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0805196

Work Order Summary

CLIENT:	Mr. Jaceque Powell ARCADIS, Inc. 11490 Westheimer, Suite 600 Houston, TX 77077	**BILL TO:**	Ms. Joyce Williams ARCADIS, Inc. 630 Plaza Drive Suite 100 Highlands Ranch, CO 80129
PHONE:	(281)-497-6900	**P.O. #**	GP 08RAAP.0047
FAX:	(281) 496-2936	**PROJECT #**	RAAP RAAP
DATE RECEIVED:	05/09/2008	**CONTACT:**	Brandon Dunmore
DATE COMPLETED:	05/12/2008		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	1034SLB00B (050808)	Modified TO-15	9.5 "Hg	5 psi
02A	1034SLB00A (050808)	Modified TO-15	8.0 "Hg	5 psi
03A	1041SG002 (050808)	Modified TO-15	6.5 "Hg	15 psi
04A	1034SG007 (050808)	Modified TO-15	6.5 "Hg	15 psi
05A	1034SG004 (050808)	Modified TO-15	7.0 "Hg	15 psi
06A	Lab Blank	Modified TO-15	NA	NA
07A	CCV	Modified TO-15	NA	NA
08A	LCS	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 05/12/08

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified TO-15
ARCADIS, Inc.
Workorder# 0805196

Two 6 Liter Summa Canister and three 1 Liter Summa Canister samples were received on May 09, 2008. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 0.2 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Daily CCV	+- 30% Difference	</= 30% Difference with two allowed out up to </=40%.; flag and narrate outliers
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1034SLB00B (050808)

Lab ID#: 0805196-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.98	1.6	4.8	7.8
Freon 11	0.98	0.37 J	5.5	2.0 J
Acetone	3.9	3.3 J	9.3	7.9 J
Carbon Disulfide	0.98	0.23 J	3.0	0.71 J
Methylene Chloride	0.98	1.4	3.4	5.0
Hexane	0.98	0.48 J	3.4	1.7 J
2-Butanone (Methyl Ethyl Ketone)	0.98	0.54 J	2.9	1.6 J
Chloroform	0.98	130	4.8	650
Benzene	0.98	0.23 J	3.1	0.75 J
Trichloroethene	0.98	1.8	5.3	9.9
Bromodichloromethane	0.98	5.8	6.6	39
Toluene	0.98	0.35 J	3.7	1.3 J
Tetrachloroethene	0.98	0.25 J	6.6	1.7 J
Dibromochloromethane	0.98	0.29 J	8.3	2.5 J

Client Sample ID: 1034SLB00A (050808)

Lab ID#: 0805196-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.92	1.1	4.5	5.3
Freon 11	0.92	0.30 J	5.1	1.7 J
Ethanol	3.7	1.4 J	6.9	2.7 J
Acetone	3.7	6.7	8.7	16
2-Propanol	3.7	0.53 J	9.0	1.3 J
Carbon Disulfide	0.92	0.14 J	2.8	0.45 J
Methylene Chloride	0.92	0.61 J	3.2	2.1 J
2-Butanone (Methyl Ethyl Ketone)	0.92	1.3	2.7	3.8
Chloroform	0.92	190	4.5	940
1,1,1-Trichloroethane	0.92	0.30 J	5.0	1.6 J
Benzene	0.92	0.21 J	2.9	0.67 J
Trichloroethene	0.92	3.1	4.9	17
Bromodichloromethane	0.92	7.8	6.1	52
Toluene	0.92	0.66 J	3.4	2.5 J
Tetrachloroethene	0.92	0.28 J	6.2	1.9 J
2-Hexanone	3.7	0.25 J	15	1.0 J
Dibromochloromethane	0.92	0.22 J	7.8	1.9 J
m,p-Xylene	0.92	0.26 J	4.0	1.1 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1041SG002 (050808)

Lab ID#: 0805196-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.72 J	6.4	3.5 J
1,3-Butadiene	1.3	9.1	2.8	20
Freon 11	1.3	0.61 J	7.2	3.4 J
Ethanol	5.2	2.4 J	9.7	4.6 J
Acetone	5.2	25	12	59
2-Propanol	5.2	0.40 J	13	0.99 J
Carbon Disulfide	1.3	1.5	4.0	4.6
Hexane	1.3	2.2	4.5	7.6
2-Butanone (Methyl Ethyl Ketone)	1.3	3.7	3.8	11
Chloroform	1.3	75	6.3	370
1,1,1-Trichloroethane	1.3	1.1 J	7.0	5.9 J
Cyclohexane	1.3	0.78 J	4.4	2.7 J
Benzene	1.3	1.8	4.1	5.6
Heptane	1.3	1.4	5.3	5.8
Trichloroethene	1.3	3.4	6.9	18
4-Methyl-2-pentanone	1.3	0.32 J	5.3	1.3 J
Toluene	1.3	1.4	4.9	5.4
Tetrachloroethene	1.3	0.83 J	8.8	5.6 J
2-Hexanone	5.2	0.36 J	21	1.5 J
o-Xylene	1.3	0.22 J	5.6	0.98 J

Client Sample ID: 1034SG007 (050808)

Lab ID#: 0805196-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	1.3	2.5	2.8	5.6
Freon 11	1.3	0.46 J	7.2	2.6 J
Ethanol	5.2	2.0 J	9.7	3.8 J
Acetone	5.2	28	12	68
2-Propanol	5.2	2.3 J	13	5.6 J
Carbon Disulfide	1.3	9.5	4.0	30
2-Butanone (Methyl Ethyl Ketone)	1.3	4.8	3.8	14
Chloroform	1.3	11	6.3	54
Cyclohexane	1.3	1.2 J	4.4	4.2 J
Benzene	1.3	0.87 J	4.1	2.8 J
Heptane	1.3	1.0 J	5.3	4.2 J
Trichloroethene	1.3	2.4	6.9	13

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1034SG007 (050808)

Lab ID#: 0805196-04A

4-Methyl-2-pentanone	1.3	0.35 J	5.3	1.4 J
Toluene	1.3	0.74 J	4.9	2.8 J
Tetrachloroethene	1.3	0.72 J	8.8	4.8 J
2-Hexanone	5.2	0.71 J	21	2.9 J
m,p-Xylene	1.3	0.47 J	5.6	2.0 J
o-Xylene	1.3	0.53 J	5.6	2.3 J
Cumene	1.3	0.16 J	6.3	0.78 J
4-Ethyltoluene	1.3	0.38 J	6.3	1.9 J
1,3,5-Trimethylbenzene	1.3	0.58 J	6.3	2.9 J
1,2,4-Trimethylbenzene	1.3	0.68 J	6.3	3.4 J

Client Sample ID: 1034SG004 (050808)

Lab ID#: 0805196-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	1.3	7.4	2.9	16
Freon 11	1.3	0.55 J	7.4	3.1 J
Ethanol	5.3	3.4 J	9.9	6.4 J
Acetone	5.3	22	12	52
Carbon Disulfide	1.3	3.2	4.1	10
2-Butanone (Methyl Ethyl Ketone)	1.3	3.9	3.9	11
Chloroform	1.3	39	6.4	190
1,1,1-Trichloroethane	1.3	0.73 J	7.2	4.0 J
Benzene	1.3	2.5	4.2	7.9
Heptane	1.3	1.0 J	5.4	4.1 J
Trichloroethene	1.3	0.23 J	7.1	1.2 J
4-Methyl-2-pentanone	1.3	0.21 J	5.4	0.86 J
Toluene	1.3	2.0	5.0	7.7
Tetrachloroethene	1.3	0.49 J	9.0	3.3 J
2-Hexanone	5.3	0.34 J	22	1.4 J
Ethyl Benzene	1.3	0.30 J	5.7	1.3 J
m,p-Xylene	1.3	0.42 J	5.7	1.8 J
o-Xylene	1.3	0.30 J	5.7	1.3 J
Styrene	1.3	0.28 J	5.6	1.2 J
1,2,4-Trimethylbenzene	1.3	0.19 J	6.5	0.95 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SLB00B (050808)

Lab ID#: 0805196-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051014**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**1.96**	**Date of Analysis:**	**5/10/08 06:24 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.98	1.6	4.8	7.8
Freon 114	0.98	Not Detected	6.8	Not Detected
Chloromethane	3.9	Not Detected	8.1	Not Detected
Vinyl Chloride	0.98	Not Detected	2.5	Not Detected
1,3-Butadiene	0.98	Not Detected	2.2	Not Detected
Bromomethane	0.98	Not Detected	3.8	Not Detected
Chloroethane	0.98	Not Detected	2.6	Not Detected
Freon 11	0.98	0.37 J	5.5	2.0 J
Ethanol	3.9	Not Detected	7.4	Not Detected
Freon 113	0.98	Not Detected	7.5	Not Detected
1,1-Dichloroethene	0.98	Not Detected	3.9	Not Detected
Acetone	3.9	3.3 J	9.3	7.9 J
2-Propanol	3.9	Not Detected	9.6	Not Detected
Carbon Disulfide	0.98	0.23 J	3.0	0.71 J
3-Chloropropene	3.9	Not Detected	12	Not Detected
Methylene Chloride	0.98	1.4	3.4	5.0
Methyl tert-butyl ether	0.98	Not Detected	3.5	Not Detected
trans-1,2-Dichloroethene	0.98	Not Detected	3.9	Not Detected
Hexane	0.98	0.48 J	3.4	1.7 J
1,1-Dichloroethane	0.98	Not Detected	4.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.98	0.54 J	2.9	1.6 J
cis-1,2-Dichloroethene	0.98	Not Detected	3.9	Not Detected
Tetrahydrofuran	0.98	Not Detected	2.9	Not Detected
Chloroform	0.98	130	4.8	650
1,1,1-Trichloroethane	0.98	Not Detected	5.3	Not Detected
Cyclohexane	0.98	Not Detected	3.4	Not Detected
Carbon Tetrachloride	0.98	Not Detected	6.2	Not Detected
2,2,4-Trimethylpentane	0.98	Not Detected	4.6	Not Detected
Benzene	0.98	0.23 J	3.1	0.75 J
1,2-Dichloroethane	0.98	Not Detected	4.0	Not Detected
Heptane	0.98	Not Detected	4.0	Not Detected
Trichloroethene	0.98	1.8	5.3	9.9
1,2-Dichloropropane	0.98	Not Detected	4.5	Not Detected
1,4-Dioxane	3.9	Not Detected	14	Not Detected
Bromodichloromethane	0.98	5.8	6.6	39
cis-1,3-Dichloropropene	0.98	Not Detected	4.4	Not Detected
4-Methyl-2-pentanone	0.98	Not Detected	4.0	Not Detected
Toluene	0.98	0.35 J	3.7	1.3 J
trans-1,3-Dichloropropene	0.98	Not Detected	4.4	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SLB00B (050808)

Lab ID#: 0805196-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051014**	**Date of Collection: 5/8/08**	
Dil. Factor:	**1.96**	**Date of Analysis: 5/10/08 06:24 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.98	Not Detected	5.3	Not Detected
Tetrachloroethene	0.98	0.25 J	6.6	1.7 J
2-Hexanone	3.9	Not Detected	16	Not Detected
Dibromochloromethane	0.98	0.29 J	8.3	2.5 J
1,2-Dibromoethane (EDB)	0.98	Not Detected	7.5	Not Detected
Chlorobenzene	0.98	Not Detected	4.5	Not Detected
Ethyl Benzene	0.98	Not Detected	4.2	Not Detected
m,p-Xylene	0.98	Not Detected	4.2	Not Detected
o-Xylene	0.98	Not Detected	4.2	Not Detected
Styrene	0.98	Not Detected	4.2	Not Detected
Bromoform	0.98	Not Detected	10	Not Detected
Cumene	0.98	Not Detected	4.8	Not Detected
1,1,2,2-Tetrachloroethane	0.98	Not Detected	6.7	Not Detected
Propylbenzene	0.98	Not Detected	4.8	Not Detected
4-Ethyltoluene	0.98	Not Detected	4.8	Not Detected
1,3,5-Trimethylbenzene	0.98	Not Detected	4.8	Not Detected
1,2,4-Trimethylbenzene	0.98	Not Detected	4.8	Not Detected
1,3-Dichlorobenzene	0.98	Not Detected	5.9	Not Detected
1,4-Dichlorobenzene	0.98	Not Detected	5.9	Not Detected
alpha-Chlorotoluene	0.98	Not Detected	5.1	Not Detected
1,2-Dichlorobenzene	0.98	Not Detected	5.9	Not Detected
1,2,4-Trichlorobenzene	3.9	Not Detected	29	Not Detected
Hexachlorobutadiene	3.9	Not Detected	42	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	123	70-130
4-Bromofluorobenzene	102	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SLB00A (050808)

Lab ID#: 0805196-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051015**	**Date of Collection: 5/8/08**	
Dil. Factor:	**1.83**	**Date of Analysis: 5/10/08 07:06 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.92	1.1	4.5	5.3
Freon 114	0.92	Not Detected	6.4	Not Detected
Chloromethane	3.7	Not Detected	7.6	Not Detected
Vinyl Chloride	0.92	Not Detected	2.3	Not Detected
1,3-Butadiene	0.92	Not Detected	2.0	Not Detected
Bromomethane	0.92	Not Detected	3.6	Not Detected
Chloroethane	0.92	Not Detected	2.4	Not Detected
Freon 11	0.92	0.30 J	5.1	1.7 J
Ethanol	3.7	1.4 J	6.9	2.7 J
Freon 113	0.92	Not Detected	7.0	Not Detected
1,1-Dichloroethene	0.92	Not Detected	3.6	Not Detected
Acetone	3.7	6.7	8.7	16
2-Propanol	3.7	0.53 J	9.0	1.3 J
Carbon Disulfide	0.92	0.14 J	2.8	0.45 J
3-Chloropropene	3.7	Not Detected	11	Not Detected
Methylene Chloride	0.92	0.61 J	3.2	2.1 J
Methyl tert-butyl ether	0.92	Not Detected	3.3	Not Detected
trans-1,2-Dichloroethene	0.92	Not Detected	3.6	Not Detected
Hexane	0.92	Not Detected	3.2	Not Detected
1,1-Dichloroethane	0.92	Not Detected	3.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.92	1.3	2.7	3.8
cis-1,2-Dichloroethene	0.92	Not Detected	3.6	Not Detected
Tetrahydrofuran	0.92	Not Detected	2.7	Not Detected
Chloroform	0.92	190	4.5	940
1,1,1-Trichloroethane	0.92	0.30 J	5.0	1.6 J
Cyclohexane	0.92	Not Detected	3.1	Not Detected
Carbon Tetrachloride	0.92	Not Detected	5.8	Not Detected
2,2,4-Trimethylpentane	0.92	Not Detected	4.3	Not Detected
Benzene	0.92	0.21 J	2.9	0.67 J
1,2-Dichloroethane	0.92	Not Detected	3.7	Not Detected
Heptane	0.92	Not Detected	3.7	Not Detected
Trichloroethene	0.92	3.1	4.9	17
1,2-Dichloropropane	0.92	Not Detected	4.2	Not Detected
1,4-Dioxane	3.7	Not Detected	13	Not Detected
Bromodichloromethane	0.92	7.8	6.1	52
cis-1,3-Dichloropropene	0.92	Not Detected	4.2	Not Detected
4-Methyl-2-pentanone	0.92	Not Detected	3.7	Not Detected
Toluene	0.92	0.66 J	3.4	2.5 J
trans-1,3-Dichloropropene	0.92	Not Detected	4.2	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SLB00A (050808)

Lab ID#: 0805196-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051015**	**Date of Collection: 5/8/08**	
Dil. Factor:	**1.83**	**Date of Analysis: 5/10/08 07:06 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.92	Not Detected	5.0	Not Detected
Tetrachloroethene	0.92	0.28 J	6.2	1.9 J
2-Hexanone	3.7	0.25 J	15	1.0 J
Dibromochloromethane	0.92	0.22 J	7.8	1.9 J
1,2-Dibromoethane (EDB)	0.92	Not Detected	7.0	Not Detected
Chlorobenzene	0.92	Not Detected	4.2	Not Detected
Ethyl Benzene	0.92	Not Detected	4.0	Not Detected
m,p-Xylene	0.92	0.26 J	4.0	1.1 J
o-Xylene	0.92	Not Detected	4.0	Not Detected
Styrene	0.92	Not Detected	3.9	Not Detected
Bromoform	0.92	Not Detected	9.4	Not Detected
Cumene	0.92	Not Detected	4.5	Not Detected
1,1,2,2-Tetrachloroethane	0.92	Not Detected	6.3	Not Detected
Propylbenzene	0.92	Not Detected	4.5	Not Detected
4-Ethyltoluene	0.92	Not Detected	4.5	Not Detected
1,3,5-Trimethylbenzene	0.92	Not Detected	4.5	Not Detected
1,2,4-Trimethylbenzene	0.92	Not Detected	4.5	Not Detected
1,3-Dichlorobenzene	0.92	Not Detected	5.5	Not Detected
1,4-Dichlorobenzene	0.92	Not Detected	5.5	Not Detected
alpha-Chlorotoluene	0.92	Not Detected	4.7	Not Detected
1,2-Dichlorobenzene	0.92	Not Detected	5.5	Not Detected
1,2,4-Trichlorobenzene	3.7	Not Detected	27	Not Detected
Hexachlorobutadiene	3.7	Not Detected	39	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	102	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG002 (050808)

Lab ID#: 0805196-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051016**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**2.58**	**Date of Analysis:**	**5/10/08 07:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.72 J	6.4	3.5 J
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	5.2	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	9.1	2.8	20
Bromomethane	1.3	Not Detected	5.0	Not Detected
Chloroethane	1.3	Not Detected	3.4	Not Detected
Freon 11	1.3	0.61 J	7.2	3.4 J
Ethanol	5.2	2.4 J	9.7	4.6 J
Freon 113	1.3	Not Detected	9.9	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	5.2	25	12	59
2-Propanol	5.2	0.40 J	13	0.99 J
Carbon Disulfide	1.3	1.5	4.0	4.6
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.5	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	2.2	4.5	7.6
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	3.7	3.8	11
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.8	Not Detected
Chloroform	1.3	75	6.3	370
1,1,1-Trichloroethane	1.3	1.1 J	7.0	5.9 J
Cyclohexane	1.3	0.78 J	4.4	2.7 J
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.0	Not Detected
Benzene	1.3	1.8	4.1	5.6
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	1.4	5.3	5.8
Trichloroethene	1.3	3.4	6.9	18
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	0.32 J	5.3	1.3 J
Toluene	1.3	1.4	4.9	5.4
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG002 (050808)

Lab ID#: 0805196-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051016**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.58**	**Date of Analysis: 5/10/08 07:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	0.83 J	8.8	5.6 J
2-Hexanone	5.2	0.36 J	21	1.5 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	Not Detected	5.6	Not Detected
m,p-Xylene	1.3	Not Detected	5.6	Not Detected
o-Xylene	1.3	0.22 J	5.6	0.98 J
Styrene	1.3	Not Detected	5.5	Not Detected
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.3	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	Not Detected	6.3	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.3	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.7	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	38	Not Detected
Hexachlorobutadiene	5.2	Not Detected	55	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	125	70-130
4-Bromofluorobenzene	103	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG007 (050808)

Lab ID#: 0805196-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051017**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.58**	**Date of Analysis: 5/10/08 08:24 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	Not Detected	6.4	Not Detected
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	5.2	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	2.5	2.8	5.6
Bromomethane	1.3	Not Detected	5.0	Not Detected
Chloroethane	1.3	Not Detected	3.4	Not Detected
Freon 11	1.3	0.46 J	7.2	2.6 J
Ethanol	5.2	2.0 J	9.7	3.8 J
Freon 113	1.3	Not Detected	9.9	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	5.2	28	12	68
2-Propanol	5.2	2.3 J	13	5.6 J
Carbon Disulfide	1.3	9.5	4.0	30
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.5	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	Not Detected	4.5	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	4.8	3.8	14
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.8	Not Detected
Chloroform	1.3	11	6.3	54
1,1,1-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Cyclohexane	1.3	1.2 J	4.4	4.2 J
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.0	Not Detected
Benzene	1.3	0.87 J	4.1	2.8 J
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	1.0 J	5.3	4.2 J
Trichloroethene	1.3	2.4	6.9	13
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	0.35 J	5.3	1.4 J
Toluene	1.3	0.74 J	4.9	2.8 J
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG007 (050808)

Lab ID#: 0805196-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051017**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.58**	**Date of Analysis: 5/10/08 08:24 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	0.72 J	8.8	4.8 J
2-Hexanone	5.2	0.71 J	21	2.9 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	Not Detected	5.6	Not Detected
m,p-Xylene	1.3	0.47 J	5.6	2.0 J
o-Xylene	1.3	0.53 J	5.6	2.3 J
Styrene	1.3	Not Detected	5.5	Not Detected
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	0.16 J	6.3	0.78 J
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	Not Detected	6.3	Not Detected
4-Ethyltoluene	1.3	0.38 J	6.3	1.9 J
1,3,5-Trimethylbenzene	1.3	0.58 J	6.3	2.9 J
1,2,4-Trimethylbenzene	1.3	0.68 J	6.3	3.4 J
1,3-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.7	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	38	Not Detected
Hexachlorobutadiene	5.2	Not Detected	55	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	126	70-130
4-Bromofluorobenzene	101	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG004 (050808)

Lab ID#: 0805196-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051018**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.64**	**Date of Analysis: 5/10/08 09:02 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	Not Detected	6.5	Not Detected
Freon 114	1.3	Not Detected	9.2	Not Detected
Chloromethane	5.3	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	7.4	2.9	16
Bromomethane	1.3	Not Detected	5.1	Not Detected
Chloroethane	1.3	Not Detected	3.5	Not Detected
Freon 11	1.3	0.55 J	7.4	3.1 J
Ethanol	5.3	3.4 J	9.9	6.4 J
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Acetone	5.3	22	12	52
2-Propanol	5.3	Not Detected	13	Not Detected
Carbon Disulfide	1.3	3.2	4.1	10
3-Chloropropene	5.3	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.6	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.8	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Hexane	1.3	Not Detected	4.6	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	3.9	3.9	11
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.9	Not Detected
Chloroform	1.3	39	6.4	190
1,1,1-Trichloroethane	1.3	0.73 J	7.2	4.0 J
Cyclohexane	1.3	Not Detected	4.5	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.3	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.2	Not Detected
Benzene	1.3	2.5	4.2	7.9
1,2-Dichloroethane	1.3	Not Detected	5.3	Not Detected
Heptane	1.3	1.0 J	5.4	4.1 J
Trichloroethene	1.3	0.23 J	7.1	1.2 J
1,2-Dichloropropane	1.3	Not Detected	6.1	Not Detected
1,4-Dioxane	5.3	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	8.8	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected
4-Methyl-2-pentanone	1.3	0.21 J	5.4	0.86 J
Toluene	1.3	2.0	5.0	7.7
trans-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG004 (050808)

Lab ID#: 0805196-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051018**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.64**	**Date of Analysis: 5/10/08 09:02 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Tetrachloroethene	1.3	0.49 J	9.0	3.3 J
2-Hexanone	5.3	0.34 J	22	1.4 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.1	Not Detected
Ethyl Benzene	1.3	0.30 J	5.7	1.3 J
m,p-Xylene	1.3	0.42 J	5.7	1.8 J
o-Xylene	1.3	0.30 J	5.7	1.3 J
Styrene	1.3	0.28 J	5.6	1.2 J
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.5	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.1	Not Detected
Propylbenzene	1.3	Not Detected	6.5	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.5	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.5	Not Detected
1,2,4-Trimethylbenzene	1.3	0.19 J	6.5	0.95 J
1,3-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.8	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,2,4-Trichlorobenzene	5.3	Not Detected	39	Not Detected
Hexachlorobutadiene	5.3	Not Detected	56	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	89	70-130
1,2-Dichloroethane-d4	123	70-130
4-Bromofluorobenzene	101	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805196-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051006a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/10/08 12:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	0.12 J	1.5	0.35 J
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805196-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051006a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/10/08 12:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	0.055 J	2.6	0.28 J
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	99	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805196-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051002**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/10/08 08:31 AM**	

Compound	%Recovery
Freon 12	110
Freon 114	110
Chloromethane	120
Vinyl Chloride	100
1,3-Butadiene	101
Bromomethane	105
Chloroethane	81
Freon 11	112
Ethanol	85
Freon 113	101
1,1-Dichloroethene	93
Acetone	82
2-Propanol	86
Carbon Disulfide	82
3-Chloropropene	76
Methylene Chloride	90
Methyl tert-butyl ether	83
trans-1,2-Dichloroethene	85
Hexane	81
1,1-Dichloroethane	88
2-Butanone (Methyl Ethyl Ketone)	87
cis-1,2-Dichloroethene	100
Tetrahydrofuran	94
Chloroform	108
1,1,1-Trichloroethane	116
Cyclohexane	89
Carbon Tetrachloride	127
2,2,4-Trimethylpentane	99
Benzene	98
1,2-Dichloroethane	130
Heptane	98
Trichloroethene	106
1,2-Dichloropropane	103
1,4-Dioxane	100
Bromodichloromethane	121
cis-1,3-Dichloropropene	108
4-Methyl-2-pentanone	108
Toluene	97
trans-1,3-Dichloropropene	117

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805196-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051002**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/10/08 08:31 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	100
Tetrachloroethene	108
2-Hexanone	109
Dibromochloromethane	124
1,2-Dibromoethane (EDB)	114
Chlorobenzene	102
Ethyl Benzene	97
m,p-Xylene	96
o-Xylene	97
Styrene	100
Bromoform	130
Cumene	96
1,1,2,2-Tetrachloroethane	106
Propylbenzene	99
4-Ethyltoluene	102
1,3,5-Trimethylbenzene	94
1,2,4-Trimethylbenzene	93
1,3-Dichlorobenzene	104
1,4-Dichlorobenzene	105
alpha-Chlorotoluene	120
1,2-Dichlorobenzene	102
1,2,4-Trichlorobenzene	82
Hexachlorobutadiene	75

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	124	70-130
4-Bromofluorobenzene	111	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805196-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/10/08 09:19 AM**	

Compound	%Recovery
Freon 12	103
Freon 114	100
Chloromethane	123
Vinyl Chloride	103
1,3-Butadiene	101
Bromomethane	107
Chloroethane	87
Freon 11	111
Ethanol	94
Freon 113	114
1,1-Dichloroethene	110
Acetone	88
2-Propanol	96
Carbon Disulfide	90
3-Chloropropene	83
Methylene Chloride	105
Methyl tert-butyl ether	91
trans-1,2-Dichloroethene	91
Hexane	90
1,1-Dichloroethane	97
2-Butanone (Methyl Ethyl Ketone)	96
cis-1,2-Dichloroethene	106
Tetrahydrofuran	98
Chloroform	111
1,1,1-Trichloroethane	114
Cyclohexane	92
Carbon Tetrachloride	122
2,2,4-Trimethylpentane	102
Benzene	104
1,2-Dichloroethane	131 Q
Heptane	107
Trichloroethene	107
1,2-Dichloropropane	108
1,4-Dioxane	100
Bromodichloromethane	123
cis-1,3-Dichloropropene	111
4-Methyl-2-pentanone	112
Toluene	105
trans-1,3-Dichloropropene	124

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805196-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**7051003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/10/08 09:19 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	106
Tetrachloroethene	113
2-Hexanone	114
Dibromochloromethane	128
1,2-Dibromoethane (EDB)	115
Chlorobenzene	107
Ethyl Benzene	101
m,p-Xylene	101
o-Xylene	103
Styrene	101
Bromoform	134
Cumene	104
1,1,2,2-Tetrachloroethane	113
Propylbenzene	105
4-Ethyltoluene	104
1,3,5-Trimethylbenzene	97
1,2,4-Trimethylbenzene	95
1,3-Dichlorobenzene	106
1,4-Dichlorobenzene	105
alpha-Chlorotoluene	124
1,2-Dichlorobenzene	102
1,2,4-Trichlorobenzene	105
Hexachlorobutadiene	89

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	107	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

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- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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Hours 8:00 A.M to 6:00 P.M. Pacific

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0805199

Work Order Summary

CLIENT:	Mr. Jaceque Powell ARCADIS, Inc. 11490 Westheimer, Suite 600 Houston, TX 77077	**BILL TO:**	Ms. Joyce Williams ARCADIS, Inc. 630 Plaza Drive Suite 100 Highlands Ranch, CO 80129
PHONE:	(281)-497-6900	**P.O. #**	GP 08RAAP.0047
FAX:	(281) 496-2936	**PROJECT #**	RAAP RAAP
DATE RECEIVED:	05/09/2008	**CONTACT:**	Brandon Dunmore
DATE COMPLETED:	05/12/2008		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	1034SG002 (050808)	Modified TO-15	7.5 "Hg	15 psi
02A	1034SG008 (050808)	Modified TO-15	7.0 "Hg	15 psi
03A	1041SG003 (050808)	Modified TO-15	8.0 "Hg	15 psi
04A	1041SG001 (050808)	Modified TO-15	6.0 "Hg	15 psi
05A	1041SG004 (050808)	Modified TO-15	8.0 "Hg	15 psi
06A	1034SG001 (050808)	Modified TO-15	7.0 "Hg	15 psi
07A	1034SG006 (050808)	Modified TO-15	6.5 "Hg	15 psi
07AA	1034SG006 (050808) Lab Duplicate	Modified TO-15	6.5 "Hg	15 psi
08A	Lab Blank	Modified TO-15	NA	NA
09A	CCV	Modified TO-15	NA	NA
10A	LCS	Modified TO-15	NA	NA

CERTIFIED BY: Linda D. Frumarn DATE: 05/13/08

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified TO-15
ARCADIS, Inc.
Workorder# 0805199

Seven 1 Liter Summa Canister samples were received on May 09, 2008. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 0.2 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
Daily CCV	+- 30% Difference	</= 30% Difference with two allowed out up to </=40%.; flag and narrate outliers
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per project specific client request, the laboratory has reported estimated values for target compounds that are detected below the Reporting Limit but greater than the Method Detection Limit. Concentrations below the level at which the canister was certified (at the Reporting Limit) may be false positives.

Tetrahydrofuran was detected in the laboratory blank analyzed on May 13, 2008 at less than 5X the reporting limit.

Associated samples that contained tetrahydrofuran were flagged as indicated.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not

performed).

J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1034SG002 (050808)

Lab ID#: 0805199-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	1.3	4.0	3.0	8.8
Freon 11	1.3	0.61 J	7.6	3.4 J
Ethanol	5.4	12	10	23
Acetone	5.4	41	13	97
Carbon Disulfide	1.3	2.6	4.2	8.0
Methylene Chloride	1.3	0.51 J	4.7	1.8 J
Hexane	1.3	1.9	4.7	6.8
2-Butanone (Methyl Ethyl Ketone)	1.3	5.4	4.0	16
Tetrahydrofuran	1.3	1.2 J B	4.0	3.4 J B
Chloroform	1.3	83	6.6	400
Cyclohexane	1.3	0.57 J	4.6	2.0 J
Benzene	1.3	1.6	4.3	5.1
Heptane	1.3	0.86 J	5.5	3.5 J
Trichloroethene	1.3	0.96 J	7.2	5.2 J
Bromodichloromethane	1.3	3.1	9.0	21
4-Methyl-2-pentanone	1.3	0.34 J	5.5	1.4 J
Toluene	1.3	2.2	5.1	8.3
2-Hexanone	5.4	0.53 J	22	2.2 J
Ethyl Benzene	1.3	0.61 J	5.8	2.6 J
m,p-Xylene	1.3	0.86 J	5.8	3.7 J
o-Xylene	1.3	0.48 J	5.8	2.1 J

Client Sample ID: 1034SG008 (050808)

Lab ID#: 0805199-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	5.3	14	12	31
Ethanol	21	3.7 J	40	7.0 J
Acetone	21	49	50	120
Carbon Disulfide	5.3	8.0	16	25
Methylene Chloride	5.3	6.2	18	21
Hexane	5.3	4.5 J	19	16 J
2-Butanone (Methyl Ethyl Ketone)	5.3	8.6	16	25
Tetrahydrofuran	5.3	4.0 J B	16	12 J B
Chloroform	5.3	1800	26	8800
Cyclohexane	5.3	2.6 J	18	8.9 J
Carbon Tetrachloride	5.3	1.5 J	33	9.4 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1034SG008 (050808)

Lab ID#: 0805199-02A

Benzene	5.3	4.7 J	17	15 J
Heptane	5.3	2.7 J	22	11 J
Trichloroethene	5.3	3.1 J	28	17 J
Bromodichloromethane	5.3	8.6	36	58
Toluene	5.3	4.1 J	20	16 J
m,p-Xylene	5.3	2.1 J	23	9.1 J
o-Xylene	5.3	1.0 J	23	4.6 J
Styrene	5.3	0.88 J	22	3.7 J

Client Sample ID: 1041SG003 (050808)

Lab ID#: 0805199-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,3-Butadiene	3.4	11	7.6	24
Ethanol	14	4.4 J	26	8.4 J
1,1-Dichloroethene	3.4	13	14	52
Acetone	14	41	33	97
Carbon Disulfide	3.4	3.0 J	11	9.4 J
Methylene Chloride	3.4	1.2 J	12	4.2 J
Hexane	3.4	16	12	57
1,1-Dichloroethane	3.4	3.4	14	14
2-Butanone (Methyl Ethyl Ketone)	3.4	3.8	10	11
Tetrahydrofuran	3.4	2.4 J B	10	7.1 J B
Chloroform	3.4	1.4 J	17	6.7 J
1,1,1-Trichloroethane	3.4	88	19	480
Cyclohexane	3.4	3.4	12	12
Benzene	3.4	2.7 J	11	8.6 J
Heptane	3.4	12	14	48
Trichloroethene	3.4	610	18	3300
Toluene	3.4	2.0 J	13	7.4 J
Tetrachloroethene	3.4	80	23	540
m,p-Xylene	3.4	0.44 J	15	1.9 J
o-Xylene	3.4	0.79 J	15	3.4 J

Client Sample ID: 1041SG001 (050808)

Lab ID#: 0805199-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1041SG001 (050808)

Lab ID#: 0805199-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.49 J	6.2	2.4 J
1,3-Butadiene	1.3	13	2.8	29
Bromomethane	1.3	1.0 J	4.9	3.9 J
Ethanol	5.1	12	9.5	23
Acetone	5.1	81	12	190
Carbon Disulfide	1.3	6.5	3.9	20
Hexane	1.3	3.6	4.4	13
2-Butanone (Methyl Ethyl Ketone)	1.3	6.7	3.7	20
Tetrahydrofuran	1.3	0.91 J B	3.7	2.7 J B
Chloroform	1.3	2.1	6.2	10
1,1,1-Trichloroethane	1.3	0.64 J	6.9	3.5 J
Cyclohexane	1.3	0.44 J	4.4	1.5 J
Benzene	1.3	4.8	4.0	15
Heptane	1.3	2.4	5.2	9.7
Trichloroethene	1.3	1.0 J	6.8	5.4 J
4-Methyl-2-pentanone	1.3	0.31 J	5.2	1.3 J
Toluene	1.3	3.5	4.8	13
Ethyl Benzene	1.3	0.50 J	5.5	2.2 J
m,p-Xylene	1.3	0.54 J	5.5	2.4 J
o-Xylene	1.3	0.35 J	5.5	1.5 J
Styrene	1.3	0.47 J	5.4	2.0 J

Client Sample ID: 1041SG004 (050808)

Lab ID#: 0805199-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Chloromethane	5.5	1.1 J	11	2.2 J
1,3-Butadiene	1.4	17	3.0	37
Ethanol	5.5	5.7	10	11
Acetone	5.5	43	13	100
Carbon Disulfide	1.4	8.1	4.3	25
Hexane	1.4	6.2	4.9	22
2-Butanone (Methyl Ethyl Ketone)	1.4	7.1	4.1	21
Tetrahydrofuran	1.4	0.99 J B	4.1	2.9 J B
Chloroform	1.4	0.56 J	6.7	2.7 J
Cyclohexane	1.4	0.86 J	4.8	3.0 J
Benzene	1.4	6.6	4.4	21

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1041SG004 (050808)

Lab ID#: 0805199-05A

Heptane	1.4	3.7	5.6	15
Toluene	1.4	5.2	5.2	19
2-Hexanone	5.5	0.52 J	23	2.1 J
Ethyl Benzene	1.4	0.84 J	6.0	3.7 J
m,p-Xylene	1.4	1.1 J	6.0	4.6 J
o-Xylene	1.4	0.55 J	6.0	2.4 J
Styrene	1.4	0.57 J	5.9	2.4 J
4-Ethyltoluene	1.4	0.32 J	6.8	1.6 J

Client Sample ID: 1034SG001 (050808)

Lab ID#: 0805199-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Chloromethane	5.3	1.2 J	11	2.6 J
1,3-Butadiene	1.3	2.2	2.9	4.8
Freon 11	1.3	0.39 J	7.4	2.2 J
Ethanol	5.3	19	9.9	36
Acetone	5.3	260	12	620
2-Propanol	5.3	2.4 J	13	5.9 J
Carbon Disulfide	1.3	0.84 J	4.1	2.6 J
Hexane	1.3	2.6	4.6	9.0
2-Butanone (Methyl Ethyl Ketone)	1.3	31	3.9	92
Tetrahydrofuran	1.3	1.2 J B	3.9	3.6 J B
Chloroform	1.3	0.47 J	6.4	2.3 J
Cyclohexane	1.3	1.8	4.5	6.0
Benzene	1.3	1.3	4.2	4.3
Heptane	1.3	3.6	5.4	14
Trichloroethene	1.3	0.55 J	7.1	3.0 J
4-Methyl-2-pentanone	1.3	1.8	5.4	7.5
Toluene	1.3	1.0 J	5.0	3.9 J
2-Hexanone	5.3	3.6 J	22	15 J
Ethyl Benzene	1.3	0.54 J	5.7	2.4 J
m,p-Xylene	1.3	1.9	5.7	8.2
o-Xylene	1.3	0.60 J	5.7	2.6 J
Styrene	1.3	0.30 J	5.6	1.3 J
4-Ethyltoluene	1.3	2.3	6.5	11
1,3,5-Trimethylbenzene	1.3	2.8	6.5	14
1,2,4-Trimethylbenzene	1.3	3.4	6.5	17

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1034SG006 (050808)

Lab ID#: 0805199-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Chloromethane	5.2	3.0 J	11	6.3 J
1,3-Butadiene	1.3	7.9	2.8	17
Bromomethane	1.3	1.5	5.0	5.7
Freon 11	1.3	0.59 J	7.2	3.3 J
Ethanol	5.2	7.7	9.7	14
Acetone	5.2	120	12	280
2-Propanol	5.2	1.4 J	13	3.3 J
Carbon Disulfide	1.3	5.1	4.0	16
Methylene Chloride	1.3	0.39 J	4.5	1.4 J
Hexane	1.3	9.6	4.5	34
2-Butanone (Methyl Ethyl Ketone)	1.3	9.5	3.8	28
Tetrahydrofuran	1.3	1.1 J B	3.8	3.2 J B
Cyclohexane	1.3	0.88 J	4.4	3.0 J
Benzene	1.3	5.6	4.1	18
Heptane	1.3	6.4	5.3	26
Trichloroethene	1.3	4.2	6.9	22
4-Methyl-2-pentanone	1.3	0.43 J	5.3	1.8 J
Toluene	1.3	2.9	4.9	11
2-Hexanone	5.2	0.65 J	21	2.7 J
Ethyl Benzene	1.3	0.67 J	5.6	2.9 J
m,p-Xylene	1.3	1.8	5.6	8.0
o-Xylene	1.3	0.65 J	5.6	2.8 J
Styrene	1.3	0.73 J	5.5	3.1 J
Propylbenzene	1.3	0.35 J	6.3	1.7 J
4-Ethyltoluene	1.3	0.37 J	6.3	1.8 J
1,2,4-Trimethylbenzene	1.3	0.42 J	6.3	2.1 J

Client Sample ID: 1034SG006 (050808) Lab Duplicate

Lab ID#: 0805199-07AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Chloromethane	5.2	2.1 J	11	4.4 J
1,3-Butadiene	1.3	6.7	2.8	15
Bromomethane	1.3	1.4	5.0	5.5
Ethanol	5.2	5.6	9.7	10
Acetone	5.2	100	12	240
2-Propanol	5.2	1.3 J	13	3.2 J

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 1034SG006 (050808) Lab Duplicate

Lab ID#: 0805199-07AA

Carbon Disulfide	1.3	4.3	4.0	13
Hexane	1.3	8.4	4.5	30
2-Butanone (Methyl Ethyl Ketone)	1.3	8.6	3.8	25
Tetrahydrofuran	1.3	1.1 J B	3.8	3.2 J B
Cyclohexane	1.3	1.1 J	4.4	3.7 J
Benzene	1.3	5.3	4.1	17
Heptane	1.3	6.4	5.3	26
Trichloroethene	1.3	3.6	6.9	19
Toluene	1.3	3.0	4.9	11
2-Hexanone	5.2	0.74 J	21	3.0 J
Ethyl Benzene	1.3	0.72 J	5.6	3.1 J
m,p-Xylene	1.3	1.9	5.6	8.4
o-Xylene	1.3	0.61 J	5.6	2.6 J
Styrene	1.3	0.69 J	5.5	3.0 J
Propylbenzene	1.3	0.20 J	6.3	0.99 J
4-Ethyltoluene	1.3	0.40 J	6.3	2.0 J
1,3,5-Trimethylbenzene	1.3	0.26 J	6.3	1.3 J
1,2,4-Trimethylbenzene	1.3	0.49 J	6.3	2.4 J

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG002 (050808)

Lab ID#: 0805199-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051218**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**2.69**	**Date of Analysis:**	**5/12/08 11:07 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	Not Detected	6.6	Not Detected
Freon 114	1.3	Not Detected	9.4	Not Detected
Chloromethane	5.4	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	4.0	3.0	8.8
Bromomethane	1.3	Not Detected	5.2	Not Detected
Chloroethane	1.3	Not Detected	3.5	Not Detected
Freon 11	1.3	0.61 J	7.6	3.4 J
Ethanol	5.4	12	10	23
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Acetone	5.4	41	13	97
2-Propanol	5.4	Not Detected	13	Not Detected
Carbon Disulfide	1.3	2.6	4.2	8.0
3-Chloropropene	5.4	Not Detected	17	Not Detected
Methylene Chloride	1.3	0.51 J	4.7	1.8 J
Methyl tert-butyl ether	1.3	Not Detected	4.8	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Hexane	1.3	1.9	4.7	6.8
1,1-Dichloroethane	1.3	Not Detected	5.4	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	5.4	4.0	16
cis-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Tetrahydrofuran	1.3	1.2 J B	4.0	3.4 J B
Chloroform	1.3	83	6.6	400
1,1,1-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Cyclohexane	1.3	0.57 J	4.6	2.0 J
Carbon Tetrachloride	1.3	Not Detected	8.5	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.3	Not Detected
Benzene	1.3	1.6	4.3	5.1
1,2-Dichloroethane	1.3	Not Detected	5.4	Not Detected
Heptane	1.3	0.86 J	5.5	3.5 J
Trichloroethene	1.3	0.96 J	7.2	5.2 J
1,2-Dichloropropane	1.3	Not Detected	6.2	Not Detected
1,4-Dioxane	5.4	Not Detected	19	Not Detected
Bromodichloromethane	1.3	3.1	9.0	21
cis-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected
4-Methyl-2-pentanone	1.3	0.34 J	5.5	1.4 J
Toluene	1.3	2.2	5.1	8.3
trans-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG002 (050808)

Lab ID#: 0805199-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051218**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.69**	**Date of Analysis: 5/12/08 11:07 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Tetrachloroethene	1.3	Not Detected	9.1	Not Detected
2-Hexanone	5.4	0.53 J	22	2.2 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.2	Not Detected
Ethyl Benzene	1.3	0.61 J	5.8	2.6 J
m,p-Xylene	1.3	0.86 J	5.8	3.7 J
o-Xylene	1.3	0.48 J	5.8	2.1 J
Styrene	1.3	Not Detected	5.7	Not Detected
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.6	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.2	Not Detected
Propylbenzene	1.3	Not Detected	6.6	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.6	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.6	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.6	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	7.0	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
1,2,4-Trichlorobenzene	5.4	Not Detected	40	Not Detected
Hexachlorobutadiene	5.4	Not Detected	57	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	82	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG008 (050808)

Lab ID#: 0805199-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051217**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**10.6**	**Date of Analysis:**	**5/12/08 10:23 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	5.3	Not Detected	26	Not Detected
Freon 114	5.3	Not Detected	37	Not Detected
Chloromethane	21	Not Detected	44	Not Detected
Vinyl Chloride	5.3	Not Detected	14	Not Detected
1,3-Butadiene	5.3	14	12	31
Bromomethane	5.3	Not Detected	20	Not Detected
Chloroethane	5.3	Not Detected	14	Not Detected
Freon 11	5.3	Not Detected	30	Not Detected
Ethanol	21	3.7 J	40	7.0 J
Freon 113	5.3	Not Detected	41	Not Detected
1,1-Dichloroethene	5.3	Not Detected	21	Not Detected
Acetone	21	49	50	120
2-Propanol	21	Not Detected	52	Not Detected
Carbon Disulfide	5.3	8.0	16	25
3-Chloropropene	21	Not Detected	66	Not Detected
Methylene Chloride	5.3	6.2	18	21
Methyl tert-butyl ether	5.3	Not Detected	19	Not Detected
trans-1,2-Dichloroethene	5.3	Not Detected	21	Not Detected
Hexane	5.3	4.5 J	19	16 J
1,1-Dichloroethane	5.3	Not Detected	21	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.3	8.6	16	25
cis-1,2-Dichloroethene	5.3	Not Detected	21	Not Detected
Tetrahydrofuran	5.3	4.0 J B	16	12 J B
Chloroform	5.3	1800	26	8800
1,1,1-Trichloroethane	5.3	Not Detected	29	Not Detected
Cyclohexane	5.3	2.6 J	18	8.9 J
Carbon Tetrachloride	5.3	1.5 J	33	9.4 J
2,2,4-Trimethylpentane	5.3	Not Detected	25	Not Detected
Benzene	5.3	4.7 J	17	15 J
1,2-Dichloroethane	5.3	Not Detected	21	Not Detected
Heptane	5.3	2.7 J	22	11 J
Trichloroethene	5.3	3.1 J	28	17 J
1,2-Dichloropropane	5.3	Not Detected	24	Not Detected
1,4-Dioxane	21	Not Detected	76	Not Detected
Bromodichloromethane	5.3	8.6	36	58
cis-1,3-Dichloropropene	5.3	Not Detected	24	Not Detected
4-Methyl-2-pentanone	5.3	Not Detected	22	Not Detected
Toluene	5.3	4.1 J	20	16 J
trans-1,3-Dichloropropene	5.3	Not Detected	24	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG008 (050808)

Lab ID#: 0805199-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051217**	**Date of Collection: 5/8/08**	
Dil. Factor:	**10.6**	**Date of Analysis: 5/12/08 10:23 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	5.3	Not Detected	29	Not Detected
Tetrachloroethene	5.3	Not Detected	36	Not Detected
2-Hexanone	21	Not Detected	87	Not Detected
Dibromochloromethane	5.3	Not Detected	45	Not Detected
1,2-Dibromoethane (EDB)	5.3	Not Detected	41	Not Detected
Chlorobenzene	5.3	Not Detected	24	Not Detected
Ethyl Benzene	5.3	Not Detected	23	Not Detected
m,p-Xylene	5.3	2.1 J	23	9.1 J
o-Xylene	5.3	1.0 J	23	4.6 J
Styrene	5.3	0.88 J	22	3.7 J
Bromoform	5.3	Not Detected	55	Not Detected
Cumene	5.3	Not Detected	26	Not Detected
1,1,2,2-Tetrachloroethane	5.3	Not Detected	36	Not Detected
Propylbenzene	5.3	Not Detected	26	Not Detected
4-Ethyltoluene	5.3	Not Detected	26	Not Detected
1,3,5-Trimethylbenzene	5.3	Not Detected	26	Not Detected
1,2,4-Trimethylbenzene	5.3	Not Detected	26	Not Detected
1,3-Dichlorobenzene	5.3	Not Detected	32	Not Detected
1,4-Dichlorobenzene	5.3	Not Detected	32	Not Detected
alpha-Chlorotoluene	5.3	Not Detected	27	Not Detected
1,2-Dichlorobenzene	5.3	Not Detected	32	Not Detected
1,2,4-Trichlorobenzene	21	Not Detected	160	Not Detected
Hexachlorobutadiene	21	Not Detected	230	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	83	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG003 (050808)

Lab ID#: 0805199-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051212**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**6.90**	**Date of Analysis:**	**5/12/08 06:21 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	3.4	Not Detected	17	Not Detected
Freon 114	3.4	Not Detected	24	Not Detected
Chloromethane	14	Not Detected	28	Not Detected
Vinyl Chloride	3.4	Not Detected	8.8	Not Detected
1,3-Butadiene	3.4	11	7.6	24
Bromomethane	3.4	Not Detected	13	Not Detected
Chloroethane	3.4	Not Detected	9.1	Not Detected
Freon 11	3.4	Not Detected	19	Not Detected
Ethanol	14	4.4 J	26	8.4 J
Freon 113	3.4	Not Detected	26	Not Detected
1,1-Dichloroethene	3.4	13	14	52
Acetone	14	41	33	97
2-Propanol	14	Not Detected	34	Not Detected
Carbon Disulfide	3.4	3.0 J	11	9.4 J
3-Chloropropene	14	Not Detected	43	Not Detected
Methylene Chloride	3.4	1.2 J	12	4.2 J
Methyl tert-butyl ether	3.4	Not Detected	12	Not Detected
trans-1,2-Dichloroethene	3.4	Not Detected	14	Not Detected
Hexane	3.4	16	12	57
1,1-Dichloroethane	3.4	3.4	14	14
2-Butanone (Methyl Ethyl Ketone)	3.4	3.8	10	11
cis-1,2-Dichloroethene	3.4	Not Detected	14	Not Detected
Tetrahydrofuran	3.4	2.4 J B	10	7.1 J B
Chloroform	3.4	1.4 J	17	6.7 J
1,1,1-Trichloroethane	3.4	88	19	480
Cyclohexane	3.4	3.4	12	12
Carbon Tetrachloride	3.4	Not Detected	22	Not Detected
2,2,4-Trimethylpentane	3.4	Not Detected	16	Not Detected
Benzene	3.4	2.7 J	11	8.6 J
1,2-Dichloroethane	3.4	Not Detected	14	Not Detected
Heptane	3.4	12	14	48
Trichloroethene	3.4	610	18	3300
1,2-Dichloropropane	3.4	Not Detected	16	Not Detected
1,4-Dioxane	14	Not Detected	50	Not Detected
Bromodichloromethane	3.4	Not Detected	23	Not Detected
cis-1,3-Dichloropropene	3.4	Not Detected	16	Not Detected
4-Methyl-2-pentanone	3.4	Not Detected	14	Not Detected
Toluene	3.4	2.0 J	13	7.4 J
trans-1,3-Dichloropropene	3.4	Not Detected	16	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG003 (050808)

Lab ID#: 0805199-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051212**	**Date of Collection: 5/8/08**	
Dil. Factor:	**6.90**	**Date of Analysis: 5/12/08 06:21 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	3.4	Not Detected	19	Not Detected
Tetrachloroethene	3.4	80	23	540
2-Hexanone	14	Not Detected	56	Not Detected
Dibromochloromethane	3.4	Not Detected	29	Not Detected
1,2-Dibromoethane (EDB)	3.4	Not Detected	26	Not Detected
Chlorobenzene	3.4	Not Detected	16	Not Detected
Ethyl Benzene	3.4	Not Detected	15	Not Detected
m,p-Xylene	3.4	0.44 J	15	1.9 J
o-Xylene	3.4	0.79 J	15	3.4 J
Styrene	3.4	Not Detected	15	Not Detected
Bromoform	3.4	Not Detected	36	Not Detected
Cumene	3.4	Not Detected	17	Not Detected
1,1,2,2-Tetrachloroethane	3.4	Not Detected	24	Not Detected
Propylbenzene	3.4	Not Detected	17	Not Detected
4-Ethyltoluene	3.4	Not Detected	17	Not Detected
1,3,5-Trimethylbenzene	3.4	Not Detected	17	Not Detected
1,2,4-Trimethylbenzene	3.4	Not Detected	17	Not Detected
1,3-Dichlorobenzene	3.4	Not Detected	21	Not Detected
1,4-Dichlorobenzene	3.4	Not Detected	21	Not Detected
alpha-Chlorotoluene	3.4	Not Detected	18	Not Detected
1,2-Dichlorobenzene	3.4	Not Detected	21	Not Detected
1,2,4-Trichlorobenzene	14	Not Detected	100	Not Detected
Hexachlorobutadiene	14	Not Detected	150	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	85	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG001 (050808)

Lab ID#: 0805199-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051211**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**2.53**	**Date of Analysis:**	**5/12/08 05:37 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	0.49 J	6.2	2.4 J
Freon 114	1.3	Not Detected	8.8	Not Detected
Chloromethane	5.1	Not Detected	10	Not Detected
Vinyl Chloride	1.3	Not Detected	3.2	Not Detected
1,3-Butadiene	1.3	13	2.8	29
Bromomethane	1.3	1.0 J	4.9	3.9 J
Chloroethane	1.3	Not Detected	3.3	Not Detected
Freon 11	1.3	Not Detected	7.1	Not Detected
Ethanol	5.1	12	9.5	23
Freon 113	1.3	Not Detected	9.7	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Acetone	5.1	81	12	190
2-Propanol	5.1	Not Detected	12	Not Detected
Carbon Disulfide	1.3	6.5	3.9	20
3-Chloropropene	5.1	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.4	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Hexane	1.3	3.6	4.4	13
1,1-Dichloroethane	1.3	Not Detected	5.1	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	6.7	3.7	20
cis-1,2-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Tetrahydrofuran	1.3	0.91 J B	3.7	2.7 J B
Chloroform	1.3	2.1	6.2	10
1,1,1-Trichloroethane	1.3	0.64 J	6.9	3.5 J
Cyclohexane	1.3	0.44 J	4.4	1.5 J
Carbon Tetrachloride	1.3	Not Detected	8.0	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	5.9	Not Detected
Benzene	1.3	4.8	4.0	15
1,2-Dichloroethane	1.3	Not Detected	5.1	Not Detected
Heptane	1.3	2.4	5.2	9.7
Trichloroethene	1.3	1.0 J	6.8	5.4 J
1,2-Dichloropropane	1.3	Not Detected	5.8	Not Detected
1,4-Dioxane	5.1	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.5	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.7	Not Detected
4-Methyl-2-pentanone	1.3	0.31 J	5.2	1.3 J
Toluene	1.3	3.5	4.8	13
trans-1,3-Dichloropropene	1.3	Not Detected	5.7	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG001 (050808)

Lab ID#: 0805199-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051211**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.53**	**Date of Analysis: 5/12/08 05:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	6.9	Not Detected
Tetrachloroethene	1.3	Not Detected	8.6	Not Detected
2-Hexanone	5.1	Not Detected	21	Not Detected
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.7	Not Detected
Chlorobenzene	1.3	Not Detected	5.8	Not Detected
Ethyl Benzene	1.3	0.50 J	5.5	2.2 J
m,p-Xylene	1.3	0.54 J	5.5	2.4 J
o-Xylene	1.3	0.35 J	5.5	1.5 J
Styrene	1.3	0.47 J	5.4	2.0 J
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.2	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.7	Not Detected
Propylbenzene	1.3	Not Detected	6.2	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.2	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.2	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.2	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.5	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.6	Not Detected
1,2,4-Trichlorobenzene	5.1	Not Detected	38	Not Detected
Hexachlorobutadiene	5.1	Not Detected	54	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	86	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG004 (050808)

Lab ID#: 0805199-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051210**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.76**	**Date of Analysis: 5/12/08 04:57 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.4	Not Detected	6.8	Not Detected
Freon 114	1.4	Not Detected	9.6	Not Detected
Chloromethane	5.5	1.1 J	11	2.2 J
Vinyl Chloride	1.4	Not Detected	3.5	Not Detected
1,3-Butadiene	1.4	17	3.0	37
Bromomethane	1.4	Not Detected	5.4	Not Detected
Chloroethane	1.4	Not Detected	3.6	Not Detected
Freon 11	1.4	Not Detected	7.8	Not Detected
Ethanol	5.5	5.7	10	11
Freon 113	1.4	Not Detected	10	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Acetone	5.5	43	13	100
2-Propanol	5.5	Not Detected	14	Not Detected
Carbon Disulfide	1.4	8.1	4.3	25
3-Chloropropene	5.5	Not Detected	17	Not Detected
Methylene Chloride	1.4	Not Detected	4.8	Not Detected
Methyl tert-butyl ether	1.4	Not Detected	5.0	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Hexane	1.4	6.2	4.9	22
1,1-Dichloroethane	1.4	Not Detected	5.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.4	7.1	4.1	21
cis-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Tetrahydrofuran	1.4	0.99 J B	4.1	2.9 J B
Chloroform	1.4	0.56 J	6.7	2.7 J
1,1,1-Trichloroethane	1.4	Not Detected	7.5	Not Detected
Cyclohexane	1.4	0.86 J	4.8	3.0 J
Carbon Tetrachloride	1.4	Not Detected	8.7	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.4	Not Detected
Benzene	1.4	6.6	4.4	21
1,2-Dichloroethane	1.4	Not Detected	5.6	Not Detected
Heptane	1.4	3.7	5.6	15
Trichloroethene	1.4	Not Detected	7.4	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.4	Not Detected
1,4-Dioxane	5.5	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.2	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.6	Not Detected
Toluene	1.4	5.2	5.2	19
trans-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1041SG004 (050808)

Lab ID#: 0805199-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051210**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.76**	**Date of Analysis: 5/12/08 04:57 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.4	Not Detected	7.5	Not Detected
Tetrachloroethene	1.4	Not Detected	9.4	Not Detected
2-Hexanone	5.5	0.52 J	23	2.1 J
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.4	Not Detected
Ethyl Benzene	1.4	0.84 J	6.0	3.7 J
m,p-Xylene	1.4	1.1 J	6.0	4.6 J
o-Xylene	1.4	0.55 J	6.0	2.4 J
Styrene	1.4	0.57 J	5.9	2.4 J
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.8	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.5	Not Detected
Propylbenzene	1.4	Not Detected	6.8	Not Detected
4-Ethyltoluene	1.4	0.32 J	6.8	1.6 J
1,3,5-Trimethylbenzene	1.4	Not Detected	6.8	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	6.8	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.1	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
1,2,4-Trichlorobenzene	5.5	Not Detected	41	Not Detected
Hexachlorobutadiene	5.5	Not Detected	59	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	84	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG001 (050808)

Lab ID#: 0805199-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051214**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**2.64**	**Date of Analysis:**	**5/12/08 07:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	Not Detected	6.5	Not Detected
Freon 114	1.3	Not Detected	9.2	Not Detected
Chloromethane	5.3	1.2 J	11	2.6 J
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	2.2	2.9	4.8
Bromomethane	1.3	Not Detected	5.1	Not Detected
Chloroethane	1.3	Not Detected	3.5	Not Detected
Freon 11	1.3	0.39 J	7.4	2.2 J
Ethanol	5.3	19	9.9	36
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Acetone	5.3	260	12	620
2-Propanol	5.3	2.4 J	13	5.9 J
Carbon Disulfide	1.3	0.84 J	4.1	2.6 J
3-Chloropropene	5.3	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.6	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.8	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Hexane	1.3	2.6	4.6	9.0
1,1-Dichloroethane	1.3	Not Detected	5.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	31	3.9	92
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Tetrahydrofuran	1.3	1.2 J B	3.9	3.6 J B
Chloroform	1.3	0.47 J	6.4	2.3 J
1,1,1-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Cyclohexane	1.3	1.8	4.5	6.0
Carbon Tetrachloride	1.3	Not Detected	8.3	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.2	Not Detected
Benzene	1.3	1.3	4.2	4.3
1,2-Dichloroethane	1.3	Not Detected	5.3	Not Detected
Heptane	1.3	3.6	5.4	14
Trichloroethene	1.3	0.55 J	7.1	3.0 J
1,2-Dichloropropane	1.3	Not Detected	6.1	Not Detected
1,4-Dioxane	5.3	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	8.8	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected
4-Methyl-2-pentanone	1.3	1.8	5.4	7.5
Toluene	1.3	1.0 J	5.0	3.9 J
trans-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG001 (050808)

Lab ID#: 0805199-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051214**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.64**	**Date of Analysis: 5/12/08 07:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Tetrachloroethene	1.3	Not Detected	9.0	Not Detected
2-Hexanone	5.3	3.6 J	22	15 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.1	Not Detected
Ethyl Benzene	1.3	0.54 J	5.7	2.4 J
m,p-Xylene	1.3	1.9	5.7	8.2
o-Xylene	1.3	0.60 J	5.7	2.6 J
Styrene	1.3	0.30 J	5.6	1.3 J
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.5	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.1	Not Detected
Propylbenzene	1.3	Not Detected	6.5	Not Detected
4-Ethyltoluene	1.3	2.3	6.5	11
1,3,5-Trimethylbenzene	1.3	2.8	6.5	14
1,2,4-Trimethylbenzene	1.3	3.4	6.5	17
1,3-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.8	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,2,4-Trichlorobenzene	5.3	Not Detected	39	Not Detected
Hexachlorobutadiene	5.3	Not Detected	56	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	86	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG006 (050808)

Lab ID#: 0805199-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051213**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**2.58**	**Date of Analysis:**	**5/12/08 07:07 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	Not Detected	6.4	Not Detected
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	5.2	3.0 J	11	6.3 J
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	7.9	2.8	17
Bromomethane	1.3	1.5	5.0	5.7
Chloroethane	1.3	Not Detected	3.4	Not Detected
Freon 11	1.3	0.59 J	7.2	3.3 J
Ethanol	5.2	7.7	9.7	14
Freon 113	1.3	Not Detected	9.9	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	5.2	120	12	280
2-Propanol	5.2	1.4 J	13	3.3 J
Carbon Disulfide	1.3	5.1	4.0	16
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	1.3	0.39 J	4.5	1.4 J
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	9.6	4.5	34
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	9.5	3.8	28
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	1.1 J B	3.8	3.2 J B
Chloroform	1.3	Not Detected	6.3	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Cyclohexane	1.3	0.88 J	4.4	3.0 J
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.0	Not Detected
Benzene	1.3	5.6	4.1	18
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	6.4	5.3	26
Trichloroethene	1.3	4.2	6.9	22
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	0.43 J	5.3	1.8 J
Toluene	1.3	2.9	4.9	11
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG006 (050808)

Lab ID#: 0805199-07A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051213**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.58**	**Date of Analysis: 5/12/08 07:07 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	Not Detected	8.8	Not Detected
2-Hexanone	5.2	0.65 J	21	2.7 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	0.67 J	5.6	2.9 J
m,p-Xylene	1.3	1.8	5.6	8.0
o-Xylene	1.3	0.65 J	5.6	2.8 J
Styrene	1.3	0.73 J	5.5	3.1 J
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.3	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	0.35 J	6.3	1.7 J
4-Ethyltoluene	1.3	0.37 J	6.3	1.8 J
1,3,5-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,2,4-Trimethylbenzene	1.3	0.42 J	6.3	2.1 J
1,3-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.7	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	38	Not Detected
Hexachlorobutadiene	5.2	Not Detected	55	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	86	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG006 (050808) Lab Duplicate

Lab ID#: 0805199-07AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051215**	**Date of Collection:**	**5/8/08**
Dil. Factor:	**2.58**	**Date of Analysis:**	**5/12/08 08:37 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	1.3	Not Detected	6.4	Not Detected
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	5.2	2.1 J	11	4.4 J
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	6.7	2.8	15
Bromomethane	1.3	1.4	5.0	5.5
Chloroethane	1.3	Not Detected	3.4	Not Detected
Freon 11	1.3	Not Detected	7.2	Not Detected
Ethanol	5.2	5.6	9.7	10
Freon 113	1.3	Not Detected	9.9	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	5.2	100	12	240
2-Propanol	5.2	1.3 J	13	3.2 J
Carbon Disulfide	1.3	4.3	4.0	13
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	1.3	Not Detected	4.5	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.6	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	8.4	4.5	30
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	8.6	3.8	25
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	1.1 J B	3.8	3.2 J B
Chloroform	1.3	Not Detected	6.3	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Cyclohexane	1.3	1.1 J	4.4	3.7 J
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	Not Detected	6.0	Not Detected
Benzene	1.3	5.3	4.1	17
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	6.4	5.3	26
Trichloroethene	1.3	3.6	6.9	19
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.3	Not Detected
Toluene	1.3	3.0	4.9	11
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: 1034SG006 (050808) Lab Duplicate

Lab ID#: 0805199-07AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051215**	**Date of Collection: 5/8/08**	
Dil. Factor:	**2.58**	**Date of Analysis: 5/12/08 08:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	Not Detected	8.8	Not Detected
2-Hexanone	5.2	0.74 J	21	3.0 J
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	0.72 J	5.6	3.1 J
m,p-Xylene	1.3	1.9	5.6	8.4
o-Xylene	1.3	0.61 J	5.6	2.6 J
Styrene	1.3	0.69 J	5.5	3.0 J
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.3	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	0.20 J	6.3	0.99 J
4-Ethyltoluene	1.3	0.40 J	6.3	2.0 J
1,3,5-Trimethylbenzene	1.3	0.26 J	6.3	1.3 J
1,2,4-Trimethylbenzene	1.3	0.49 J	6.3	2.4 J
1,3-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.7	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	38	Not Detected
Hexachlorobutadiene	5.2	Not Detected	55	Not Detected

J = Estimated value.
B = Compound present in laboratory blank greater than reporting limit, background subtraction not performed.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	86	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805199-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051206a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/12/08 01:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	0.74 J	4.8	1.7 J
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	0.15 J	1.7	0.51 J
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	Not Detected	1.5	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	0.60	1.5	1.8
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: Lab Blank

Lab ID#: 0805199-08A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051206a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/12/08 01:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	84	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805199-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/12/08 10:41 AM**	

Compound	%Recovery
Freon 12	90
Freon 114	85
Chloromethane	87
Vinyl Chloride	88
1,3-Butadiene	77
Bromomethane	126
Chloroethane	99
Freon 11	88
Ethanol	106
Freon 113	100
1,1-Dichloroethene	90
Acetone	99
2-Propanol	96
Carbon Disulfide	114
3-Chloropropene	114
Methylene Chloride	86
Methyl tert-butyl ether	78
trans-1,2-Dichloroethene	106
Hexane	98
1,1-Dichloroethane	109
2-Butanone (Methyl Ethyl Ketone)	107
cis-1,2-Dichloroethene	99
Tetrahydrofuran	81
Chloroform	97
1,1,1-Trichloroethane	93
Cyclohexane	100
Carbon Tetrachloride	85
2,2,4-Trimethylpentane	102
Benzene	101
1,2-Dichloroethane	87
Heptane	106
Trichloroethene	96
1,2-Dichloropropane	101
1,4-Dioxane	101
Bromodichloromethane	92
cis-1,3-Dichloropropene	96
4-Methyl-2-pentanone	92
Toluene	92
trans-1,3-Dichloropropene	106

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0805199-09A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/12/08 10:41 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	101
Tetrachloroethene	90
2-Hexanone	110
Dibromochloromethane	90
1,2-Dibromoethane (EDB)	97
Chlorobenzene	92
Ethyl Benzene	99
m,p-Xylene	92
o-Xylene	90
Styrene	93
Bromoform	86
Cumene	88
1,1,2,2-Tetrachloroethane	97
Propylbenzene	94
4-Ethyltoluene	89
1,3,5-Trimethylbenzene	89
1,2,4-Trimethylbenzene	83
1,3-Dichlorobenzene	83
1,4-Dichlorobenzene	83
alpha-Chlorotoluene	90
1,2-Dichlorobenzene	79
1,2,4-Trichlorobenzene	79
Hexachlorobutadiene	77

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	87	70-130

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805199-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/12/08 11:24 AM**	

Compound	%Recovery
Freon 12	90
Freon 114	82
Chloromethane	87
Vinyl Chloride	87
1,3-Butadiene	74
Bromomethane	123
Chloroethane	102
Freon 11	88
Ethanol	107
Freon 113	114
1,1-Dichloroethene	102
Acetone	104
2-Propanol	102
Carbon Disulfide	117
3-Chloropropene	131
Methylene Chloride	98
Methyl tert-butyl ether	96
trans-1,2-Dichloroethene	111
Hexane	104
1,1-Dichloroethane	119
2-Butanone (Methyl Ethyl Ketone)	112
cis-1,2-Dichloroethene	105
Tetrahydrofuran	84
Chloroform	104
1,1,1-Trichloroethane	100
Cyclohexane	104
Carbon Tetrachloride	91
2,2,4-Trimethylpentane	107
Benzene	115
1,2-Dichloroethane	98
Heptane	121
Trichloroethene	106
1,2-Dichloropropane	114
1,4-Dioxane	113
Bromodichloromethane	104
cis-1,3-Dichloropropene	107
4-Methyl-2-pentanone	104
Toluene	107
trans-1,3-Dichloropropene	114

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: LCS

Lab ID#: 0805199-10A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**1051204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/12/08 11:24 AM**	

Compound	%Recovery
1,1,2-Trichloroethane	111
Tetrachloroethene	98
2-Hexanone	121
Dibromochloromethane	99
1,2-Dibromoethane (EDB)	101
Chlorobenzene	99
Ethyl Benzene	105
m,p-Xylene	99
o-Xylene	97
Styrene	100
Bromoform	94
Cumene	98
1,1,2,2-Tetrachloroethane	105
Propylbenzene	104
4-Ethyltoluene	96
1,3,5-Trimethylbenzene	95
1,2,4-Trimethylbenzene	88
1,3-Dichlorobenzene	88
1,4-Dichlorobenzene	87
alpha-Chlorotoluene	97
1,2-Dichlorobenzene	83
1,2,4-Trichlorobenzene	76
Hexachlorobutadiene	73

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	88	70-130

ARCADIS

SDG #RADFORD001

SUMMARY PACKAGE

VOLATILE SECTION

ORGANIC CASE NARRATIVE - VOLATILES
Arcadis – Radford001

Date Sampled	Date Received	Lab ID	Client ID
05/06/08	05/07/08	0805055-01	5DITCHSB002(13-14)
05/06/08	05/07/08	0805055-02	5DITCHHP002(05062008)
05/06/08	05/07/08	0805055-03	5DITCHSB001(11-12)
05/06/08	05/07/08	0805055-04	5DITCHHP001(05062008)
05/06/08	05/07/08	0805055-05	5DITCHSB003(11-12)
05/06/08	05/07/08	0805055-06	5DITCHSB004(11-12)
05/06/08	05/07/08	0805055-07	TB-1(05062008)
05/06/08	05/08/08	0805074-01	5DITCHP003(05062008)
05/06/08	05/08/08	0805074-02	5DITCHP004(05062008)
05/06/08	05/08/08	0805074-03	5DUP001(05062008)
05/07/08	05/08/08	0805074-04	1549SB003(0.5-1.5)
05/07/08	05/08/08	0805074-05	1549SB001(0.5-1.5)
05/07/08	05/08/08	0805074-06	1549SB001(7-8)
05/07/08	05/08/08	0805074-07	1549DUP002(0.5-1.5)
05/07/08	05/08/08	0805074-08	1549SB004(0.5-1.5)
05/07/08	05/08/08	0805074-09	1549SB004(5-6)
05/07/08	05/08/08	0805074-10	1549SB006(0.5-1.5)
05/07/08	05/08/08	0805074-11	1549SB006(5-6)
05/07/08	05/08/08	0805074-12	1549SB003(5-6)
05/07/08	05/08/08	0805074-13	TB2(05072008-01)
05/08/08	05/09/08	0805095-01	1034SB004 (0.5-1.5)
05/08/08	05/09/08	0805095-02	1034SB004 (5-6)
05/08/08	05/09/08	0805095-03	1041SB002 (1-2)
05/08/08	05/09/08	0805095-04	1041SB002 (7-8)
05/08/08	05/09/08	0805095-05	1041HP002 (05062008)
05/08/08	05/09/08	0805095-06	TB3 (05062008-01)
05/08/08	05/09/08	0805095-07	1041SB004 (0-1)
05/08/08	05/09/08	0805095-08	1041SB004 (7-8)
05/08/08	05/09/08	0805095-09	1034SB001 (0.5-1.5)
05/08/08	05/09/08	0805095-10	1034SB001 (7-8)
05/08/08	05/09/08	0805095-11	1034SB008 (0.5-1.5)
05/08/08	05/09/08	0805095-12	1034SB008 (4-5)

Method: The samples were extracted/analyzed for client specified analyte lists by USEPA SW-846 Methods 5030B/8260B (purge and trap followed by capillary column GC/MS) for waters or 5035/8260B (encore field sampling with laboratory preservation then purge and trap followed by capillary column GC/MS) for soils upon receipt to the laboratory in satisfactory condition.

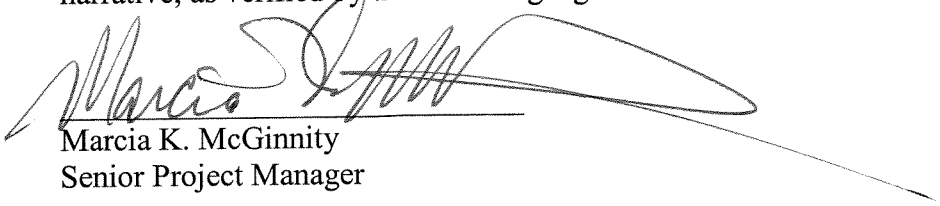
Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note: Soil samples were prepared then held pending GW results. Analyses were requested 5/16/08-5/19/08 with samples 5DITCHSB002(13-14) and 5DITCHSB001(11-12) cancelled 5/16/08. E-mail instructions are attached.
- BFB Tuning: All method tuning criteria were met.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded as indicated in the following clarifications:

1. VOA5 ICV analyzed with the initial calibration exceeded 25% difference for acetone with a negative bias at 27.5%. All reported laboratory control samples for this instrument were within 25% difference for acetone so no further action was taken.
2. VOA4 CCVs analyzed 5/8/08 met criteria for averaging on the main mix but exceeded 20% difference for 1,4-dioxane with a negative bias at 22.4%. All results for this analyte are qualified with a "Y" flag on the form Is and in the EDD.
3. VOA4 CCVs analyzed 5/14/08 met criteria for all analytes with the exception of bromomethane which exceeded 20% difference with a negative bias at 42.1%. All results for this analyte are qualified with a "Y" flag on the form Is and in the EDD.
4. VOA5 CCVs analyzed 5/20/08 at 07:28 and 07:59 met criteria for averaging on the main mix but exceeded 20% difference for 1,4-dioxane with a negative bias at 26.2%. All results for this analyte are qualified with a "Y" flag on the form Is and in the EDD.
5. VOA4 CCVs analyzed 5/20/08 at 17:17 and 17:48 met criteria for averaging on the main mix but exceeded 20% difference for 1,4-dioxane with a negative bias at 21.1%. All results for this analyte are qualified with a "Y" flag on the form Is and in the EDD.

- Method Blank Results: Chloromethane, methylene chloride and/or toluene were detected in some of the method blanks associated to these samples. Reported concentrations in the associated samples are qualified with a "B".
- Surrogate Recoveries: All recoveries were within limits.
- V4BLK0508LCS/LCSD results: Of 102 recoveries, 4 exceeded limits with a positive bias. All relative percent differences were within limits. See form 3.
- V4BLK0509LCS results: Recovery of 2-butanone exceeded the limit of 160% at 197%. All other recoveries were within limits.
- V4BLK0514LCS/LCSD results: Recoveries of chloromethane exceeded the limit of 125% at (103%)/134% All other recoveries and relative percent differences were within limits.
- V5BLK0520LCS results: Recovery of 2-butanone exceeded the limit of 160% at 168%. All other recoveries were within limits.
- V5BLK0520ELCS results: Recovery of 2-butanone exceeded the limit of 160% at 187%. All other recoveries were within limits.
- MS/MSD results: Not applicable.
- Internal Standard Area Counts: All internal standard area counts were within limits.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.



Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

\nalyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

:xtract and hold all of the other "HOLD" samples.

am waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
ane

ane Kennedy
'rinciple Scientist
ARCADIS US, Inc.
:850 N. Causeway Blvd.
;uite 1600
Metairie, LA 70002
'hone: (504) 832-4174 Ext 106
:ell: (225) 205-8256
-mail: jane.kennedy@arcadis-us.com

---

rom: Sharpe, Christopher
ient: Friday, May 16, 2008 2:50 PM
'o: Kennedy, Jane
:c: Llewellyn, Tim; Quinnan, Joseph; Wisbeck, Diane; Powell, Jace'que
iubject: RE: using 12 samples

just got off of the phone with Joe Q re these samples.
.ets analyze the soil samples from 5DitchSB003 and 5DitchSB004 for VOCs only and discard the soil samples from
iDitchSB001 and 5ditchSB002

Tim and Diane agree that the potential cost savings for extract and hold on the 12 samples referenced below makes
ense so let's do that as well.

:TS

---

rom: Kennedy, Jane
ient: Friday, May 16, 2008 1:54 PM
'o: Sharpe, Christopher
iubject: using 12 samples

;1804.80 to extract and hold the 12 for SVOCs, PCBs, Explosives

/OCs are $1782 if we analyze the 12 remaining

ane Kennedy
'rinciple Scientist
ARCADIS US, Inc.
:850 N. Causeway Blvd.
;uite 1600
Metairie, LA 70002

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Monday, May 19, 2008 3:59 PM
To: MMcGinnity@EmpirLabs.com; RVining@HNTB.com
Cc: Powell, Jace'que; Borne, Rachelle; Sharpe, Christopher
Subject: RE: Hold Samples

)K this is the story

HOLD Samples with IDs that begin with

041 – can you get 24 hour TAT for VOCs?

034 – second priority to complete after the 1041s

549 – analyze as 3rd priority, but I think with HTs. Everything is out of hold by Saturday.

.et me know and call me at home if you have any questions 504-486-7354

Thanks
ane

ane Kennedy
ARCADIS
850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002
Phone: (504) 832-4174
Cell: (225) 205-8256

rom: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
ent: Monday, May 19, 2008 7:51 AM
o: Kennedy, Jane
c: Powell, Jace'que; Borne, Rachelle
ubject: RE: Hold Samples

Anything new on this today? I forwarded the information in case they got the VOA soils working but we haven't extracted anything else at the moment. Attached are the metals results for 0805104 missing Hg - plan o have that today.

Thanks,
Marcia

-----Original Message-----
From: Kennedy, Jane [mailto:Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

Analyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

Extract and hold all of the other "HOLD" samples.

I am waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
jane

ARCADIS

Laboratory Task Order No./P.O. No. _____

060420008-01

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name GP08RAAP.0047 /RAAP

Project Location Radford, VA

Laboratory Empirical Labratories

Project Manager Tim Llewellyn \ Diane Misbeck

Sampler(s)/Affiliation SG, MW (ARCADIS)

2 coolers

0805074

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOCs	SVOCs	PCBs	Metals	Explosives		Remarks	Total
-01	SDITCHHP003(05062008)	GW	5/6/08 1940		X						24 hr TAT	3
-02	SDITCHHP004(05062008)	GW	5/6/08 1750		X						24 hr TAT	3
-03	SDUP001(05062008)	GW	5/6/08 1940		X						24 hr TAT	3
-04	1549SB003(0.5-1.5)	SO	5/7/08 10:00		X	X	X	X	X			6
-05	1549SB001(0.5-1.5)	SO	5/7/08 10:40		X	X	X	X	X			6
-06	1549SB001(7-8)	SO	5/7/08 10:50		X	X	X	X	X		(*) hold pending shallow sample	6
-07	1549DUP002(0.5-1.5)	SO	5/7/08 12:00		X	X	X	X	X			6
-08	1549SB004(0.5-1.5)	SO	5/7/08 11:45		X	X	X	X	X			6
-09	1549SB004(5-6)	SO	5/7/08 12:00		X	X	X	X	X		(*) hold pending shallow sample	6
-10	1549SB006(0.5-1.5)	SO	5/7/08 12:15		X	X	X	X	X			6
-11	1549SB006(5-6)	SO	5/7/08 12:25		X	X	X	X	X		(*) hold pending shallow sample	6
-12	1549SB003(5-6)	SO	5/7/08 15:00		X	X	X	X	X		(*) hold pending shallow sample	6
-13	TB2(05072008-01)	L	5/7/08 -		X							2

Sample Matrix: L = Liquid; S = Solid; A = Air GW = groundwater

3.2°C, 3.8°C

Total No. of Bottles/Containers: 65

					Seal Intact?
Relinquished by: Sandra Grabarski	Organization: ARCADIS	Date 5/7/08	Time 17:45		
Received by:	Organization:	Date / /	Time		Yes No N/A
Relinquished by:	Organization:	Date / /	Time		Seal Intact?
Received by:	Organization: Empirical Labs	Date 5/8/08	Time 9:00		(Yes) No N/A

Special Instructions/Remarks: (1) Questions contact Sandra Grabarski at 410-713-9921 or Jacqyne Powell at 281-509-6407 (2) 24 hour turn around time on groundwater samples, as noted above (3) please hold noted soil samples pending shallow sample results at corresponding location (4) *two coolers*

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name GP08 RAAP.0047 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck / Tim Llewellyn

Sampler(s)/Affiliation SG / ARCADIS

3805095

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs	SVOCs	PCBs	Explosives	Metals		Remarks	Total
-01	1034SB004 (0.5-1.5)	SO	5/8/08 8:30		X	X	X	X	X			6
-02	1034SB004 (5-6)	SO	5/8/08 8:45		X	X	X	X	X		(2) hold pending shallow sample result	6
-03	1041SB002 (1-2)	SO	5/8/08 0900		X	X	X	X	X			6
-04	1041SB002 (7-8)	SO	5/8/08 9:20		X	X	X	X	X		(2) hold pending shallow sample results	6
-05	1041HP002 (05062008)	GW	5/8/08 11:00		X	X	X	X	X			10
-06	TB3 (05062008-01)	L	5/8/08 —		X	X	X	X	X			2
-07	1041SB004 (0-1)	SO	5/8/08 13:50		X	X	X	X	X			6
-08	1041SB004 (7-8)	SO	5/8/08 14:00		X	X	X	X	X		(2) hold pending shallow sample result	6
-09	1034SB001 (0.5-1.5)	SO	5/8/08 14:30		X	X	X	X	X			6
-10	1034SB001 (7-8)	SO	5/8/08 14:50		X	X	X	X	X		(2) hold pending shallow sample result	6
-11	1034SB008 (0.5-1.5)	SO	5/8/08 15:20		X	X	X	X	X			6
-12	1034SB008 (4-5)	SO	5/8/08 15:30		X	X	X	X	X		(2) hold pending shallow sample (3) only 2 encores collected	5

Sample Matrix: L = Liquid; S = Solid; A = Air GW = groundwater 3.4°C, 2.7°C

Total No. of Bottles/Containers: 71

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 5/8/08	Time 1745	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: Empirical	Date 5/9/08	Time 0900	Yes	No N/A

Special Instructions/Remarks: (1) Questions, contact Sandra Grabowski 410-713-9921 or Jacelyn Powell 281-509-6407

(2) hold marked soil samples pending corresponding shallow sample results

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805074 COC ID(s): 05072008-01

Client Arcadis Project Radford

Sample Custodian WS Today's Date 5/8/08

Date/Time Samples Received 5/8/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/8/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 5/7/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
WS 5/8/08 Frozen _____

# of Coolers 2 X Temp. of Coolers ~~4°C~~ 3.2°C, 3.8°C
WS 5/8/08

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805095 COC ID(s): 05082008-01

Client Arcadis Project Radford

Sample Custodian WS Today's Date 5/9/08

Date/Time Samples Received 5/9/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/9/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 5/8/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 2 Temp. of Coolers 3.4°C, 2.7°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

_____

_____

_____

Comments:

_____

_____

_____

_____

Sample Delivery Group Assignment Form

CLIENT: Arcadis
PROJECT NAME: RAAD
SDG # Radford001
MATRIX: Groundwater/Soil

QC LEVEL: IV/EDD
Analytical Due: 5/28/2008
Report Due: 6/2/2008
CLOSED: 5/9/2008

Sample Type/count	Date Sampled	Date Rec'd	Lab ID	Client ID	VOA 8260B	SVOC 8270	PCBs 8082	EXPL+2 8330B	TAL Metals 6010B/7471A
~~S1~~	~~05/07/08~~	~~05/08/08~~	~~0805074-04~~	~~1549SB003(0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
~~S2~~	~~05/07/08~~	~~05/08/08~~	~~0805074-05~~	~~1549SB001(0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H5	05/07/08	05/08/08	0805074-06	1549SB001(7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
~~S3~~	~~05/07/08~~	~~05/08/08~~	~~0805074-07~~	~~1549DUP002(0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
~~S4~~	~~05/07/08~~	~~05/08/08~~	~~0805074-08~~	~~1549SB004(0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H6	05/07/08	05/08/08	0805074-09	1549SB004(5-6)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
~~S5~~	~~05/07/08~~	~~05/08/08~~	~~0805074-10~~	~~1549SB006(0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H7	05/07/08	05/08/08	0805074-11	1549SB006(5-6)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
H8	05/07/08	05/08/08	0805074-12	1549SB003(5-6)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
~~TB~~	~~05/07/08~~	~~05/08/08~~	~~0805074-13~~	~~TB2(05072008-01)~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~
~~S6~~	~~05/08/08~~	~~05/09/08~~	~~0805095-01~~	~~1034SB004 (0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H9	05/08/08	05/09/08	0805095-02	1034SB004 (5-6)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
~~S7~~	~~05/08/08~~	~~05/09/08~~	~~0805095-03~~	~~1041SB002 (1-2)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H10	05/08/08	05/09/08	0805095-04	1041SB002 (7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
~~GW5~~	~~05/08/08~~	~~05/09/08~~	~~0805095-05~~	~~1041HP002 (05062008)~~	~~X~~	~~X~~	~~X~~	X	~~X~~
~~S8~~	~~05/08/08~~	~~05/09/08~~	~~0805095-07~~	~~1041SB004 (0-1)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H11	05/08/08	05/09/08	0805095-08	1041SB004 (7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
~~S9~~	~~05/08/08~~	~~05/09/08~~	~~0805095-09~~	~~1034SB001 (0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H12	05/08/08	05/09/08	0805095-10	1034SB001 (7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
~~S10~~	~~05/08/08~~	~~05/09/08~~	~~0805095-11~~	~~1034SB008 (0.5-1.5)~~	~~4BD~~	~~4BD~~	~~4BD~~	4BD	~~4BD~~
H13	05/08/08	05/09/08	0805095-12	1034SB008 (4-5)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
Hold samples moved to SDG Radford003 5/19/08 pm.									

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHP00 2(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805055-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0505502

Level: (low/med) LOW Date Sampled: 05/06/08 12:40

% Moisture: not dec. _____ Date Analyzed: 05/08/08 12:18

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	1.7	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	18	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHP00 2(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805055-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0505502

Level: (low/med) LOW Date Sampled: 05/06/08 12:40

% Moisture: not dec. _____ Date Analyzed: 05/08/08 12:18

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHP00
1(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805055-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0505504

Level: (low/med) LOW Date Sampled: 05/06/08 14:50

% Moisture: not dec. _____ Date Analyzed: 05/08/08 12:47

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	0.54	J
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5DITCHP00
1(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805055-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0505504

Level: (low/med) LOW Date Sampled: 05/06/08 14:50

% Moisture: not dec. _____ Date Analyzed: 05/08/08 12:47

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5DITCHSB0
03(11-12)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805055-05

Sample wt/vol: 5.8 (g/mL) G Lab File ID: 0505505A

Level: (low/med) LOW Date Sampled: 05/06/08 13:50

% Moisture: not dec. 20 Date Analyzed: 05/20/08 10:34

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	11	26	
71-43-2	Benzene	0.20	5.4		U
74-97-5	Bromochloromethane	0.38	5.4		U
75-27-4	Bromodichloromethane	0.24	5.4		U
75-25-2	Bromoform	0.64	5.4		U
74-83-9	Bromomethane	0.44	5.4		U
78-93-3	2-Butanone	2.1	11		U
75-15-0	Carbon disulfide	0.29	5.4		U
56-23-5	Carbon tetrachloride	0.26	5.4		U
108-90-7	Chlorobenzene	0.36	5.4		U
75-00-3	Chloroethane	0.43	5.4		U
67-66-3	Chloroform	0.46	5.4		U
74-87-3	Chloromethane	0.39	5.4	0.52	JB
110-82-7	Cyclohexane	0.45	5.4		U
124-48-1	Dibromochloromethane	0.26	5.4		U
96-12-8	1,2-Dibromo-3-chloropropane	0.73	5.4		U
106-93-4	1,2-Dibromoethane	0.60	5.4		U
95-50-1	1,2-Dichlorobenzene	0.25	5.4		U
541-73-1	1,3-Dichlorobenzene	0.25	5.4		U
106-46-7	1,4-Dichlorobenzene	0.19	5.4		U
75-71-8	Dichlorodifluoromethane	0.32	5.4	0.95	J
75-34-3	1,1-Dichloroethane	0.44	5.4		U
107-06-2	1,2-Dichloroethane	0.46	5.4		U
75-35-4	1,1-Dichloroethene	0.34	5.4		U
156-59-2	cis-1,2-Dichloroethene	0.29	5.4		U
156-60-5	trans-1,2-Dichloroethene	0.59	5.4		U
78-87-5	1,2-Dichloropropane	0.61	5.4		U
10061-01-5	cis-1,3-Dichloropropene	0.38	5.4		U
10061-02-6	trans-1,3-Dichloropropene	0.40	5.4		U
123-91-1	1,4-Dioxane	0.54	54		UY
100-41-4	Ethylbenzene	0.26	5.4		U
591-78-6	2-Hexanone	0.66	11		U
98-82-8	Isopropylbenzene	0.28	5.4		U
79-20-9	Methyl acetate	0.61	5.4		U
108-87-2	Methyl cyclohexane	0.42	5.4		U
75-09-2	Methylene chloride	1.2	5.4	17	B
108-10-1	4-Methyl-2-pentanone	0.65	11		U
1634-04-4	Methyl-tert-butyl ether	0.61	5.4		U
100-42-5	Styrene	0.37	5.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHSB0
03(11-12)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805055-05

Sample wt/vol: 5.8 (g/mL) G Lab File ID: 0505505A

Level: (low/med) LOW Date Sampled: 05/06/08 13:50

% Moisture: not dec. 20 Date Analyzed: 05/20/08 10:34

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.34	5.4		U
127-18-4	Tetrachloroethene	0.23	5.4		U
108-88-3	Toluene	0.41	5.4		U
87-61-6	1,2,3-Trichlorobenzene	0.20	5.4		U
120-82-1	1,2,4-Trichlorobenzene	0.33	5.4		U
71-55-6	1,1,1-Trichloroethane	0.37	5.4		U
79-00-5	1,1,2-Trichloroethane	0.53	5.4		U
79-01-6	Trichloroethene	0.44	5.4		U
76-13-1	Trichlorotrifluoroethane	0.39	5.4		U
75-69-4	Trichlorofluoromethane	0.44	5.4		U
75-01-4	Vinyl chloride	0.51	5.4		U
1330-20-7	Xylene(total)	0.23	5.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHSB0
04(11-12)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805055-06

Sample wt/vol: 5.9 (g/mL) G Lab File ID: 0505506A

Level: (low/med) LOW Date Sampled: 05/06/08 17:10

% Moisture: not dec. 20 Date Analyzed: 05/20/08 11:05

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.6	11	8.5	J
71-43-2	Benzene	0.20	5.3		U
74-97-5	Bromochloromethane	0.37	5.3		U
75-27-4	Bromodichloromethane	0.23	5.3		U
75-25-2	Bromoform	0.63	5.3		U
74-83-9	Bromomethane	0.44	5.3		U
78-93-3	2-Butanone	2.1	11		U
75-15-0	Carbon disulfide	0.29	5.3		U
56-23-5	Carbon tetrachloride	0.25	5.3		U
108-90-7	Chlorobenzene	0.35	5.3		U
75-00-3	Chloroethane	0.42	5.3		U
67-66-3	Chloroform	0.46	5.3		U
74-87-3	Chloromethane	0.38	5.3		U
110-82-7	Cyclohexane	0.45	5.3		U
124-48-1	Dibromochloromethane	0.25	5.3		U
96-12-8	1,2-Dibromo-3-chloropropane	0.72	5.3		U
106-93-4	1,2-Dibromoethane	0.59	5.3		U
95-50-1	1,2-Dichlorobenzene	0.24	5.3		U
541-73-1	1,3-Dichlorobenzene	0.24	5.3		U
106-46-7	1,4-Dichlorobenzene	0.19	5.3		U
75-71-8	Dichlorodifluoromethane	0.32	5.3		U
75-34-3	1,1-Dichloroethane	0.44	5.3		U
107-06-2	1,2-Dichloroethane	0.46	5.3		U
75-35-4	1,1-Dichloroethene	0.34	5.3		U
156-59-2	cis-1,2-Dichloroethene	0.29	5.3		U
156-60-5	trans-1,2-Dichloroethene	0.58	5.3		U
78-87-5	1,2-Dichloropropane	0.60	5.3		U
10061-01-5	cis-1,3-Dichloropropene	0.37	5.3		U
10061-02-6	trans-1,3-Dichloropropene	0.39	5.3		U
123-91-1	1,4-Dioxane	0.53	53		UY
100-41-4	Ethylbenzene	0.25	5.3		U
591-78-6	2-Hexanone	0.65	11		U
98-82-8	Isopropylbenzene	0.28	5.3		U
79-20-9	Methyl acetate	0.60	5.3		U
108-87-2	Methyl cyclohexane	0.41	5.3		U
75-09-2	Methylene chloride	1.1	5.3	12	B
108-10-1	4-Methyl-2-pentanone	0.64	11		U
1634-04-4	Methyl-tert-butyl ether	0.60	5.3		U
100-42-5	Styrene	0.36	5.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHSB0
04(11-12)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805055-06

Sample wt/vol: 5.9 (g/mL) G Lab File ID: 0505506A

Level: (low/med) LOW Date Sampled: 05/06/08 17:10

% Moisture: not dec. 20 Date Analyzed: 05/20/08 11:05

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.34	5.3		U
127-18-4	Tetrachloroethene	0.22	5.3		U
108-88-3	Toluene	0.40	5.3		U
87-61-6	1,2,3-Trichlorobenzene	0.20	5.3		U
120-82-1	1,2,4-Trichlorobenzene	0.33	5.3		U
71-55-6	1,1,1-Trichloroethane	0.36	5.3		U
79-00-5	1,1,2-Trichloroethane	0.52	5.3		U
79-01-6	Trichloroethene	0.44	5.3		U
76-13-1	Trichlorotrifluoroethane	0.38	5.3		U
75-69-4	Trichlorofluoromethane	0.44	5.3		U
75-01-4	Vinyl chloride	0.50	5.3		U
1330-20-7	Xylene(total)	0.22	5.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-1(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805055-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0505507

Level: (low/med) LOW Date Sampled: 05/06/08

% Moisture: not dec. _____ Date Analyzed: 05/08/08 10:49

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	1.8	B
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-1(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805055-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0505507

Level: (low/med) LOW Date Sampled: 05/06/08

% Moisture: not dec. _____ Date Analyzed: 05/08/08 10:49

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHHP0 03(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507401

Level: (low/med) LOW Date Sampled: 05/06/08 19:40

% Moisture: not dec. _____ Date Analyzed: 05/08/08 15:14

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	5.8	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	1.1	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHHP0
03(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507401

Level: (low/med) LOW Date Sampled: 05/06/08 19:40

% Moisture: not dec. _____ Date Analyzed: 05/08/08 15:14

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DITCHHP0
04(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507402

Level: (low/med) LOW Date Sampled: 05/06/08 17:50

% Moisture: not dec. _____ Date Analyzed: 05/08/08 15:43

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	0.65	J
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5DITCHHP0
04(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507402

Level: (low/med) LOW Date Sampled: 05/06/08 17:50

% Moisture: not dec. _____ Date Analyzed: 05/08/08 15:43

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0	1.1	
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5DUP001(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507403

Level: (low/med) LOW Date Sampled: 05/06/08 19:40

% Moisture: not dec. _____ Date Analyzed: 05/08/08 16:13

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	6.4	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	1.1	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5DUP001(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507403

Level: (low/med) LOW Date Sampled: 05/06/08 19:40

% Moisture: not dec. _____ Date Analyzed: 05/08/08 16:13

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-04

Sample wt/vol: 6.0 (g/mL) G Lab File ID: 0507404A

Level: (low/med) LOW Date Sampled: 05/07/08 10:00

% Moisture: not dec. 23 Date Analyzed: 05/09/08 18:17

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.2	11	44	
71-43-2	Benzene	0.51	5.4		U
74-97-5	Bromochloromethane	0.45	5.4		U
75-27-4	Bromodichloromethane	0.32	5.4		U
75-25-2	Bromoform	1.1	5.4		U
74-83-9	Bromomethane	0.78	5.4		U
78-93-3	2-Butanone	1.5	11	5.3	J
75-15-0	Carbon disulfide	1.4	5.4		U
56-23-5	Carbon tetrachloride	0.95	5.4		U
108-90-7	Chlorobenzene	0.37	5.4		U
75-00-3	Chloroethane	1.2	5.4		U
67-66-3	Chloroform	0.59	5.4		U
74-87-3	Chloromethane	0.56	5.4		U
110-82-7	Cyclohexane	0.58	5.4		U
124-48-1	Dibromochloromethane	0.37	5.4		U
96-12-8	1,2-Dibromo-3-chloropropane	1.3	5.4		U
106-93-4	1,2-Dibromoethane	0.46	5.4		U
95-50-1	1,2-Dichlorobenzene	0.40	5.4		U
541-73-1	1,3-Dichlorobenzene	0.91	5.4		U
106-46-7	1,4-Dichlorobenzene	0.59	5.4		U
75-71-8	Dichlorodifluoromethane	1.2	5.4		U
75-34-3	1,1-Dichloroethane	0.58	5.4		U
107-06-2	1,2-Dichloroethane	0.50	5.4		U
75-35-4	1,1-Dichloroethene	1.3	5.4		U
156-59-2	cis-1,2-Dichloroethene	1.3	5.4		U
156-60-5	trans-1,2-Dichloroethene	1.2	5.4		U
78-87-5	1,2-Dichloropropane	0.50	5.4		U
10061-01-5	cis-1,3-Dichloropropene	0.54	5.4		U
10061-02-6	trans-1,3-Dichloropropene	0.34	5.4		U
123-91-1	1,4-Dioxane	0.54	54		U
100-41-4	Ethylbenzene	0.81	5.4		U
591-78-6	2-Hexanone	2.5	11		U
98-82-8	Isopropylbenzene	0.95	5.4		U
79-20-9	Methyl acetate	1.7	5.4		U
108-87-2	Methyl cyclohexane	0.32	5.4		U
75-09-2	Methylene chloride	0.67	5.4	6.3	B
108-10-1	4-Methyl-2-pentanone	0.63	11		U
1634-04-4	Methyl-tert-butyl ether	0.34	5.4		U
100-42-5	Styrene	0.38	5.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-04

Sample wt/vol: 6.0 (g/mL) G Lab File ID: 0507404A

Level: (low/med) LOW Date Sampled: 05/07/08 10:00

% Moisture: not dec. 23 Date Analyzed: 05/09/08 18:17

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.46	5.4		U
127-18-4	Tetrachloroethene	1.0	5.4		U
108-88-3	Toluene	0.93	5.4		U
87-61-6	1,2,3-Trichlorobenzene	0.45	5.4		U
120-82-1	1,2,4-Trichlorobenzene	0.19	5.4		U
71-55-6	1,1,1-Trichloroethane	0.97	5.4		U
79-00-5	1,1,2-Trichloroethane	0.38	5.4		U
79-01-6	Trichloroethene	0.92	5.4		U
76-13-1	Trichlorotrifluoroethane	0.59	5.4		U
75-69-4	Trichlorofluoromethane	1.0	5.4		U
75-01-4	Vinyl chloride	1.2	5.4		U
1330-20-7	Xylene(total)	0.76	5.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-05

Sample wt/vol: 5.4 (g/mL) G Lab File ID: 0507405A

Level: (low/med) LOW Date Sampled: 05/07/08 10:40

% Moisture: not dec. 24 Date Analyzed: 05/09/08 18:52

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.4	12	22	
71-43-2	Benzene	0.57	6.1		U
74-97-5	Bromochloromethane	0.51	6.1		U
75-27-4	Bromodichloromethane	0.36	6.1		U
75-25-2	Bromoform	1.2	6.1		U
74-83-9	Bromomethane	0.88	6.1		U
78-93-3	2-Butanone	1.7	12		U
75-15-0	Carbon disulfide	1.6	6.1		U
56-23-5	Carbon tetrachloride	1.1	6.1		U
108-90-7	Chlorobenzene	0.41	6.1		U
75-00-3	Chloroethane	1.3	6.1		U
67-66-3	Chloroform	0.67	6.1		U
74-87-3	Chloromethane	0.63	6.1		U
110-82-7	Cyclohexane	0.66	6.1		U
124-48-1	Dibromochloromethane	0.41	6.1		U
96-12-8	1,2-Dibromo-3-chloropropane	1.5	6.1		U
106-93-4	1,2-Dibromoethane	0.52	6.1		U
95-50-1	1,2-Dichlorobenzene	0.45	6.1		U
541-73-1	1,3-Dichlorobenzene	1.0	6.1		U
106-46-7	1,4-Dichlorobenzene	0.67	6.1		U
75-71-8	Dichlorodifluoromethane	1.3	6.1	12	
75-34-3	1,1-Dichloroethane	0.66	6.1		U
107-06-2	1,2-Dichloroethane	0.56	6.1		U
75-35-4	1,1-Dichloroethene	1.5	6.1		U
156-59-2	cis-1,2-Dichloroethene	1.5	6.1		U
156-60-5	trans-1,2-Dichloroethene	1.3	6.1		U
78-87-5	1,2-Dichloropropane	0.56	6.1		U
10061-01-5	cis-1,3-Dichloropropene	0.61	6.1		U
10061-02-6	trans-1,3-Dichloropropene	0.39	6.1		U
123-91-1	1,4-Dioxane	0.61	61		U
100-41-4	Ethylbenzene	0.91	6.1		U
591-78-6	2-Hexanone	2.8	12		U
98-82-8	Isopropylbenzene	1.1	6.1		U
79-20-9	Methyl acetate	1.9	6.1		U
108-87-2	Methyl cyclohexane	0.36	6.1		U
75-09-2	Methylene chloride	0.75	6.1	7.1	B
108-10-1	4-Methyl-2-pentanone	0.70	12		U
1634-04-4	Methyl-tert-butyl ether	0.39	6.1		U
100-42-5	Styrene	0.42	6.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-05

Sample wt/vol: 5.4 (g/mL) G Lab File ID: 0507405A

Level: (low/med) LOW Date Sampled: 05/07/08 10:40

% Moisture: not dec. 24 Date Analyzed: 05/09/08 18:52

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.52	6.1		U
127-18-4	Tetrachloroethene	1.2	6.1		U
108-88-3	Toluene	1.0	6.1		U
87-61-6	1,2,3-Trichlorobenzene	0.51	6.1		U
120-82-1	1,2,4-Trichlorobenzene	0.22	6.1		U
71-55-6	1,1,1-Trichloroethane	1.1	6.1		U
79-00-5	1,1,2-Trichloroethane	0.42	6.1		U
79-01-6	Trichloroethene	1.0	6.1		U
76-13-1	Trichlorotrifluoroethane	0.67	6.1		U
75-69-4	Trichlorofluoromethane	1.2	6.1		U
75-01-4	Vinyl chloride	1.3	6.1		U
1330-20-7	Xylene(total)	0.85	6.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB001(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-06

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0507406A

Level: (low/med) LOW Date Sampled: 05/07/08 10:50

% Moisture: not dec. 15 Date Analyzed: 05/20/08 19:52

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
67-64-1	Acetone	1.9	12	35	
71-43-2	Benzene	0.23	6.1		U
74-97-5	Bromochloromethane	0.43	6.1		U
75-27-4	Bromodichloromethane	0.27	6.1		U
75-25-2	Bromoform	0.72	6.1		U
74-83-9	Bromomethane	0.50	6.1		U
78-93-3	2-Butanone	2.4	12		U
75-15-0	Carbon disulfide	0.33	6.1		U
56-23-5	Carbon tetrachloride	0.29	6.1		U
108-90-7	Chlorobenzene	0.40	6.1		U
75-00-3	Chloroethane	0.49	6.1		U
67-66-3	Chloroform	0.53	6.1		U
74-87-3	Chloromethane	0.44	6.1		U
110-82-7	Cyclohexane	0.51	6.1		U
124-48-1	Dibromochloromethane	0.29	6.1		U
96-12-8	1,2-Dibromo-3-chloropropane	0.83	6.1		U
106-93-4	1,2-Dibromoethane	0.68	6.1		U
95-50-1	1,2-Dichlorobenzene	0.28	6.1		U
541-73-1	1,3-Dichlorobenzene	0.28	6.1		U
106-46-7	1,4-Dichlorobenzene	0.22	6.1		U
75-71-8	Dichlorodifluoromethane	0.37	6.1	0.98	J
75-34-3	1,1-Dichloroethane	0.50	6.1		U
107-06-2	1,2-Dichloroethane	0.53	6.1		U
75-35-4	1,1-Dichloroethene	0.39	6.1		U
156-59-2	cis-1,2-Dichloroethene	0.33	6.1		U
156-60-5	trans-1,2-Dichloroethene	0.67	6.1		U
78-87-5	1,2-Dichloropropane	0.70	6.1		U
10061-01-5	cis-1,3-Dichloropropene	0.43	6.1		U
10061-02-6	trans-1,3-Dichloropropene	0.45	6.1		U
123-91-1	1,4-Dioxane	0.61	61		UY
100-41-4	Ethylbenzene	0.29	6.1		U
591-78-6	2-Hexanone	0.75	12		U
98-82-8	Isopropylbenzene	0.32	6.1		U
79-20-9	Methyl acetate	0.70	6.1		U
108-87-2	Methyl cyclohexane	0.48	6.1		U
75-09-2	Methylene chloride	1.3	6.1	7.6	B
108-10-1	4-Methyl-2-pentanone	0.73	12		U
1634-04-4	Methyl-tert-butyl ether	0.70	6.1		U
100-42-5	Styrene	0.42	6.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB001(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-06

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0507406A

Level: (low/med) LOW Date Sampled: 05/07/08 10:50

% Moisture: not dec. 15 Date Analyzed: 05/20/08 19:52

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.39	6.1		U
127-18-4	Tetrachloroethene	0.26	6.1		U
108-88-3	Toluene	0.46	6.1		U
87-61-6	1,2,3-Trichlorobenzene	0.23	6.1		U
120-82-1	1,2,4-Trichlorobenzene	0.38	6.1		U
71-55-6	1,1,1-Trichloroethane	0.42	6.1		U
79-00-5	1,1,2-Trichloroethane	0.60	6.1		U
79-01-6	Trichloroethene	0.50	6.1		U
76-13-1	Trichlorotrifluoroethane	0.44	6.1		U
75-69-4	Trichlorofluoromethane	0.50	6.1		U
75-01-4	Vinyl chloride	0.58	6.1		U
1330-20-7	Xylene(total)	0.26	6.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549DUP00
2(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-07

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0507407A

Level: (low/med) LOW Date Sampled: 05/07/08 12:00

% Moisture: not dec. 22 Date Analyzed: 05/09/08 19:28

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.7	13	33	
71-43-2	Benzene	0.62	6.6		U
74-97-5	Bromochloromethane	0.56	6.6		U
75-27-4	Bromodichloromethane	0.40	6.6		U
75-25-2	Bromoform	1.3	6.6		U
74-83-9	Bromomethane	0.96	6.6		U
78-93-3	2-Butanone	1.9	13		U
75-15-0	Carbon disulfide	1.7	6.6		U
56-23-5	Carbon tetrachloride	1.2	6.6		U
108-90-7	Chlorobenzene	0.45	6.6		U
75-00-3	Chloroethane	1.5	6.6		U
67-66-3	Chloroform	0.73	6.6		U
74-87-3	Chloromethane	0.69	6.6		U
110-82-7	Cyclohexane	0.72	6.6		U
124-48-1	Dibromochloromethane	0.45	6.6		U
96-12-8	1,2-Dibromo-3-chloropropane	1.6	6.6		U
106-93-4	1,2-Dibromoethane	0.57	6.6		U
95-50-1	1,2-Dichlorobenzene	0.49	6.6		U
541-73-1	1,3-Dichlorobenzene	1.1	6.6		U
106-46-7	1,4-Dichlorobenzene	0.73	6.6		U
75-71-8	Dichlorodifluoromethane	1.5	6.6		U
75-34-3	1,1-Dichloroethane	0.72	6.6		U
107-06-2	1,2-Dichloroethane	0.61	6.6		U
75-35-4	1,1-Dichloroethene	1.6	6.6		U
156-59-2	cis-1,2-Dichloroethene	1.6	6.6		U
156-60-5	trans-1,2-Dichloroethene	1.5	6.6		U
78-87-5	1,2-Dichloropropane	0.61	6.6		U
10061-01-5	cis-1,3-Dichloropropene	0.66	6.6		U
10061-02-6	trans-1,3-Dichloropropene	0.42	6.6		U
123-91-1	1,4-Dioxane	0.66	66		U
100-41-4	Ethylbenzene	1.00	6.6		U
591-78-6	2-Hexanone	3.0	13		U
98-82-8	Isopropylbenzene	1.2	6.6		U
79-20-9	Methyl acetate	2.1	6.6		U
108-87-2	Methyl cyclohexane	0.40	6.6		U
75-09-2	Methylene chloride	0.82	6.6	6.1	JB
108-10-1	4-Methyl-2-pentanone	0.77	13		U
1634-04-4	Methyl-tert-butyl ether	0.42	6.6		U
100-42-5	Styrene	0.46	6.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549DUP00
2(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-07

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0507407A

Level: (low/med) LOW Date Sampled: 05/07/08 12:00

% Moisture: not dec. 22 Date Analyzed: 05/09/08 19:28

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.57	6.6		U
127-18-4	Tetrachloroethene	1.3	6.6		U
108-88-3	Toluene	1.1	6.6		U
87-61-6	1,2,3-Trichlorobenzene	0.56	6.6		U
120-82-1	1,2,4-Trichlorobenzene	0.24	6.6		U
71-55-6	1,1,1-Trichloroethane	1.2	6.6		U
79-00-5	1,1,2-Trichloroethane	0.46	6.6		U
79-01-6	Trichloroethene	1.1	6.6		U
76-13-1	Trichlorotrifluoroethane	0.73	6.6		U
75-69-4	Trichlorofluoromethane	1.3	6.6		U
75-01-4	Vinyl chloride	1.5	6.6		U
1330-20-7	Xylene(total)	0.93	6.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-08

Sample wt/vol: 6.4 (g/mL) G Lab File ID: 0507408A

Level: (low/med) LOW Date Sampled: 05/07/08 11:45

% Moisture: not dec. 17 Date Analyzed: 05/09/08 20:03

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.9	9.4	17	
71-43-2	Benzene	0.44	4.7		U
74-97-5	Bromochloromethane	0.40	4.7		U
75-27-4	Bromodichloromethane	0.28	4.7		U
75-25-2	Bromoform	0.94	4.7		U
74-83-9	Bromomethane	0.68	4.7		U
78-93-3	2-Butanone	1.3	9.4		U
75-15-0	Carbon disulfide	1.2	4.7		U
56-23-5	Carbon tetrachloride	0.83	4.7		U
108-90-7	Chlorobenzene	0.32	4.7		U
75-00-3	Chloroethane	1.0	4.7		U
67-66-3	Chloroform	0.52	4.7		U
74-87-3	Chloromethane	0.49	4.7		U
110-82-7	Cyclohexane	0.51	4.7		U
124-48-1	Dibromochloromethane	0.32	4.7		U
96-12-8	1,2-Dibromo-3-chloropropane	1.1	4.7		U
106-93-4	1,2-Dibromoethane	0.41	4.7		U
95-50-1	1,2-Dichlorobenzene	0.35	4.7		U
541-73-1	1,3-Dichlorobenzene	0.79	4.7		U
106-46-7	1,4-Dichlorobenzene	0.52	4.7		U
75-71-8	Dichlorodifluoromethane	1.0	4.7		U
75-34-3	1,1-Dichloroethane	0.51	4.7		U
107-06-2	1,2-Dichloroethane	0.44	4.7		U
75-35-4	1,1-Dichloroethene	1.1	4.7		U
156-59-2	cis-1,2-Dichloroethene	1.1	4.7		U
156-60-5	trans-1,2-Dichloroethene	1.0	4.7		U
78-87-5	1,2-Dichloropropane	0.44	4.7		U
10061-01-5	cis-1,3-Dichloropropene	0.47	4.7		U
10061-02-6	trans-1,3-Dichloropropene	0.30	4.7		U
123-91-1	1,4-Dioxane	0.47	47		U
100-41-4	Ethylbenzene	0.71	4.7		U
591-78-6	2-Hexanone	2.2	9.4		U
98-82-8	Isopropylbenzene	0.83	4.7		U
79-20-9	Methyl acetate	1.5	4.7		U
108-87-2	Methyl cyclohexane	0.28	4.7	0.34	J
75-09-2	Methylene chloride	0.59	4.7	4.6	JB
108-10-1	4-Methyl-2-pentanone	0.55	9.4		U
1634-04-4	Methyl-tert-butyl ether	0.30	4.7		U
100-42-5	Styrene	0.33	4.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-08

Sample wt/vol: 6.4 (g/mL) G Lab File ID: 0507408A

Level: (low/med) LOW Date Sampled: 05/07/08 11:45

% Moisture: not dec. 17 Date Analyzed: 05/09/08 20:03

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.41	4.7		U
127-18-4	Tetrachloroethene	0.92	4.7		U
108-88-3	Toluene	0.81	4.7		U
87-61-6	1,2,3-Trichlorobenzene	0.40	4.7		U
120-82-1	1,2,4-Trichlorobenzene	0.17	4.7		U
71-55-6	1,1,1-Trichloroethane	0.85	4.7		U
79-00-5	1,1,2-Trichloroethane	0.33	4.7		U
79-01-6	Trichloroethene	0.80	4.7		U
76-13-1	Trichlorotrifluoroethane	0.52	4.7		U
75-69-4	Trichlorofluoromethane	0.90	4.7		U
75-01-4	Vinyl chloride	1.0	4.7		U
1330-20-7	Xylene(total)	0.66	4.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-09

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0507409A

Level: (low/med) LOW Date Sampled: 05/07/08 12:00

% Moisture: not dec. 22 Date Analyzed: 05/20/08 20:23

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.8	11	140	
71-43-2	Benzene	0.22	5.7		U
74-97-5	Bromochloromethane	0.40	5.7		U
75-27-4	Bromodichloromethane	0.25	5.7		U
75-25-2	Bromoform	0.67	5.7		U
74-83-9	Bromomethane	0.47	5.7		U
78-93-3	2-Butanone	2.2	11	36	
75-15-0	Carbon disulfide	0.31	5.7	0.36	J
56-23-5	Carbon tetrachloride	0.27	5.7		U
108-90-7	Chlorobenzene	0.38	5.7		U
75-00-3	Chloroethane	0.45	5.7		U
67-66-3	Chloroform	0.49	5.7		U
74-87-3	Chloromethane	0.41	5.7		U
110-82-7	Cyclohexane	0.48	5.7		U
124-48-1	Dibromochloromethane	0.27	5.7		U
96-12-8	1,2-Dibromo-3-chloropropane	0.77	5.7		U
106-93-4	1,2-Dibromoethane	0.64	5.7		U
95-50-1	1,2-Dichlorobenzene	0.26	5.7		U
541-73-1	1,3-Dichlorobenzene	0.26	5.7		U
106-46-7	1,4-Dichlorobenzene	0.20	5.7		U
75-71-8	Dichlorodifluoromethane	0.34	5.7		U
75-34-3	1,1-Dichloroethane	0.47	5.7		U
107-06-2	1,2-Dichloroethane	0.49	5.7		U
75-35-4	1,1-Dichloroethene	0.36	5.7		U
156-59-2	cis-1,2-Dichloroethene	0.31	5.7		U
156-60-5	trans-1,2-Dichloroethene	0.62	5.7		U
78-87-5	1,2-Dichloropropane	0.65	5.7		U
10061-01-5	cis-1,3-Dichloropropene	0.40	5.7		U
10061-02-6	trans-1,3-Dichloropropene	0.42	5.7		U
123-91-1	1,4-Dioxane	0.57	57		UY
100-41-4	Ethylbenzene	0.27	5.7		U
591-78-6	2-Hexanone	0.69	11		U
98-82-8	Isopropylbenzene	0.30	5.7		U
79-20-9	Methyl acetate	0.65	5.7		U
108-87-2	Methyl cyclohexane	0.44	5.7		U
75-09-2	Methylene chloride	1.2	5.7	10	B
108-10-1	4-Methyl-2-pentanone	0.68	11		U
1634-04-4	Methyl-tert-butyl ether	0.65	5.7		U
100-42-5	Styrene	0.39	5.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-09

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0507409A

Level: (low/med) LOW Date Sampled: 05/07/08 12:00

% Moisture: not dec. 22 Date Analyzed: 05/20/08 20:23

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.36	5.7		U
127-18-4	Tetrachloroethene	0.24	5.7		U
108-88-3	Toluene	0.43	5.7	0.44	J
87-61-6	1,2,3-Trichlorobenzene	0.22	5.7		U
120-82-1	1,2,4-Trichlorobenzene	0.35	5.7		U
71-55-6	1,1,1-Trichloroethane	0.39	5.7		U
79-00-5	1,1,2-Trichloroethane	0.56	5.7		U
79-01-6	Trichloroethene	0.47	5.7		U
76-13-1	Trichlorotrifluoroethane	0.41	5.7		U
75-69-4	Trichlorofluoromethane	0.47	5.7		U
75-01-4	Vinyl chloride	0.53	5.7		U
1330-20-7	Xylene(total)	0.24	5.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-10

Sample wt/vol: 6.1 (g/mL) G Lab File ID: 0507410A

Level: (low/med) LOW Date Sampled: 05/07/08 12:15

% Moisture: not dec. 20 Date Analyzed: 05/09/08 20:38

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.0	10	27	
71-43-2	Benzene	0.48	5.1		U
74-97-5	Bromochloromethane	0.43	5.1		U
75-27-4	Bromodichloromethane	0.31	5.1		U
75-25-2	Bromoform	1.0	5.1		U
74-83-9	Bromomethane	0.74	5.1		U
78-93-3	2-Butanone	1.4	10	3.6	J
75-15-0	Carbon disulfide	1.3	5.1		U
56-23-5	Carbon tetrachloride	0.91	5.1		U
108-90-7	Chlorobenzene	0.35	5.1		U
75-00-3	Chloroethane	1.1	5.1		U
67-66-3	Chloroform	0.57	5.1		U
74-87-3	Chloromethane	0.54	5.1		U
110-82-7	Cyclohexane	0.56	5.1		U
124-48-1	Dibromochloromethane	0.35	5.1		U
96-12-8	1,2-Dibromo-3-chloropropane	1.2	5.1		U
106-93-4	1,2-Dibromoethane	0.44	5.1		U
95-50-1	1,2-Dichlorobenzene	0.38	5.1		U
541-73-1	1,3-Dichlorobenzene	0.86	5.1		U
106-46-7	1,4-Dichlorobenzene	0.57	5.1		U
75-71-8	Dichlorodifluoromethane	1.1	5.1		U
75-34-3	1,1-Dichloroethane	0.56	5.1		U
107-06-2	1,2-Dichloroethane	0.47	5.1		U
75-35-4	1,1-Dichloroethene	1.2	5.1		U
156-59-2	cis-1,2-Dichloroethene	1.2	5.1		U
156-60-5	trans-1,2-Dichloroethene	1.1	5.1		U
78-87-5	1,2-Dichloropropane	0.47	5.1		U
10061-01-5	cis-1,3-Dichloropropene	0.51	5.1		U
10061-02-6	trans-1,3-Dichloropropene	0.33	5.1		U
123-91-1	1,4-Dioxane	0.51	51		U
100-41-4	Ethylbenzene	0.77	5.1		U
591-78-6	2-Hexanone	2.4	10		U
98-82-8	Isopropylbenzene	0.91	5.1		U
79-20-9	Methyl acetate	1.6	5.1		U
108-87-2	Methyl cyclohexane	0.31	5.1		U
75-09-2	Methylene chloride	0.64	5.1	4.8	JB
108-10-1	4-Methyl-2-pentanone	0.60	10		U
1634-04-4	Methyl-tert-butyl ether	0.33	5.1		U
100-42-5	Styrene	0.36	5.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-10

Sample wt/vol: 6.1 (g/mL) G Lab File ID: 0507410A

Level: (low/med) LOW Date Sampled: 05/07/08 12:15

% Moisture: not dec. 20 Date Analyzed: 05/09/08 20:38

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.44	5.1		U
127-18-4	Tetrachloroethene	1.00	5.1		U
108-88-3	Toluene	0.88	5.1		U
87-61-6	1,2,3-Trichlorobenzene	0.43	5.1		U
120-82-1	1,2,4-Trichlorobenzene	0.18	5.1		U
71-55-6	1,1,1-Trichloroethane	0.93	5.1		U
79-00-5	1,1,2-Trichloroethane	0.36	5.1		U
79-01-6	Trichloroethene	0.88	5.1		U
76-13-1	Trichlorotrifluoroethane	0.57	5.1		U
75-69-4	Trichlorofluoromethane	0.98	5.1		U
75-01-4	Vinyl chloride	1.1	5.1		U
1330-20-7	Xylene(total)	0.72	5.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-11

Sample wt/vol: 6.1 (g/mL) G Lab File ID: 0507411A

Level: (low/med) LOW Date Sampled: 05/07/08 12:25

% Moisture: not dec. 21 Date Analyzed: 05/20/08 20:54

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.6	10		U
71-43-2	Benzene	0.20	5.2		U
74-97-5	Bromochloromethane	0.36	5.2		U
75-27-4	Bromodichloromethane	0.23	5.2		U
75-25-2	Bromoform	0.61	5.2		U
74-83-9	Bromomethane	0.42	5.2		U
78-93-3	2-Butanone	2.0	10	5.3	J
75-15-0	Carbon disulfide	0.28	5.2	0.48	J
56-23-5	Carbon tetrachloride	0.25	5.2		U
108-90-7	Chlorobenzene	0.34	5.2		U
75-00-3	Chloroethane	0.42	5.2		U
67-66-3	Chloroform	0.45	5.2		U
74-87-3	Chloromethane	0.37	5.2		U
110-82-7	Cyclohexane	0.44	5.2		U
124-48-1	Dibromochloromethane	0.25	5.2		U
96-12-8	1,2-Dibromo-3-chloropropane	0.71	5.2		U
106-93-4	1,2-Dibromoethane	0.58	5.2		U
95-50-1	1,2-Dichlorobenzene	0.24	5.2		U
541-73-1	1,3-Dichlorobenzene	0.24	5.2		U
106-46-7	1,4-Dichlorobenzene	0.19	5.2		U
75-71-8	Dichlorodifluoromethane	0.31	5.2		U
75-34-3	1,1-Dichloroethane	0.42	5.2		U
107-06-2	1,2-Dichloroethane	0.45	5.2		U
75-35-4	1,1-Dichloroethene	0.33	5.2		U
156-59-2	cis-1,2-Dichloroethene	0.28	5.2		U
156-60-5	trans-1,2-Dichloroethene	0.57	5.2		U
78-87-5	1,2-Dichloropropane	0.59	5.2		U
10061-01-5	cis-1,3-Dichloropropene	0.36	5.2		U
10061-02-6	trans-1,3-Dichloropropene	0.38	5.2		U
123-91-1	1,4-Dioxane	0.52	52		UY
100-41-4	Ethylbenzene	0.25	5.2		U
591-78-6	2-Hexanone	0.63	10		U
98-82-8	Isopropylbenzene	0.27	5.2		U
79-20-9	Methyl acetate	0.59	5.2		U
108-87-2	Methyl cyclohexane	0.40	5.2		U
75-09-2	Methylene chloride	1.1	5.2	9.4	B
108-10-1	4-Methyl-2-pentanone	0.62	10		U
1634-04-4	Methyl-tert-butyl ether	0.59	5.2		U
100-42-5	Styrene	0.35	5.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-11

Sample wt/vol: 6.1 (g/mL) G Lab File ID: 0507411A

Level: (low/med) LOW Date Sampled: 05/07/08 12:25

% Moisture: not dec. 21 Date Analyzed: 05/20/08 20:54

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.33	5.2		U
127-18-4	Tetrachloroethene	0.22	5.2		U
108-88-3	Toluene	0.39	5.2		U
87-61-6	1,2,3-Trichlorobenzene	0.20	5.2		U
120-82-1	1,2,4-Trichlorobenzene	0.32	5.2		U
71-55-6	1,1,1-Trichloroethane	0.35	5.2		U
79-00-5	1,1,2-Trichloroethane	0.51	5.2		U
79-01-6	Trichloroethene	0.42	5.2		U
76-13-1	Trichlorotrifluoroethane	0.37	5.2		U
75-69-4	Trichlorofluoromethane	0.42	5.2		U
75-01-4	Vinyl chloride	0.49	5.2		U
1330-20-7	Xylene(total)	0.22	5.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-12

Sample wt/vol: 5.9 (g/mL) G Lab File ID: 0507412A

Level: (low/med) LOW Date Sampled: 05/07/08 15:00

% Moisture: not dec. 13 Date Analyzed: 05/20/08 21:25

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.5	9.8	34	
71-43-2	Benzene	0.18	4.9		U
74-97-5	Bromochloromethane	0.34	4.9		U
75-27-4	Bromodichloromethane	0.22	4.9		U
75-25-2	Bromoform	0.58	4.9		U
74-83-9	Bromomethane	0.40	4.9		U
78-93-3	2-Butanone	1.9	9.8	10	
75-15-0	Carbon disulfide	0.26	4.9		U
56-23-5	Carbon tetrachloride	0.23	4.9		U
108-90-7	Chlorobenzene	0.32	4.9		U
75-00-3	Chloroethane	0.39	4.9		U
67-66-3	Chloroform	0.42	4.9		U
74-87-3	Chloromethane	0.35	4.9		U
110-82-7	Cyclohexane	0.41	4.9		U
124-48-1	Dibromochloromethane	0.23	4.9		U
96-12-8	1,2-Dibromo-3-chloropropane	0.66	4.9		U
106-93-4	1,2-Dibromoethane	0.55	4.9		U
95-50-1	1,2-Dichlorobenzene	0.22	4.9		U
541-73-1	1,3-Dichlorobenzene	0.22	4.9		U
106-46-7	1,4-Dichlorobenzene	0.18	4.9		U
75-71-8	Dichlorodifluoromethane	0.29	4.9		U
75-34-3	1,1-Dichloroethane	0.40	4.9		U
107-06-2	1,2-Dichloroethane	0.42	4.9		U
75-35-4	1,1-Dichloroethene	0.31	4.9		U
156-59-2	cis-1,2-Dichloroethene	0.26	4.9		U
156-60-5	trans-1,2-Dichloroethene	0.54	4.9		U
78-87-5	1,2-Dichloropropane	0.56	4.9		U
10061-01-5	cis-1,3-Dichloropropene	0.34	4.9		U
10061-02-6	trans-1,3-Dichloropropene	0.36	4.9		U
123-91-1	1,4-Dioxane	0.49	49		UY
100-41-4	Ethylbenzene	0.23	4.9		U
591-78-6	2-Hexanone	0.60	9.8		U
98-82-8	Isopropylbenzene	0.25	4.9		U
79-20-9	Methyl acetate	0.56	4.9		U
108-87-2	Methyl cyclohexane	0.38	4.9		U
75-09-2	Methylene chloride	1.0	4.9	5.0	B
108-10-1	4-Methyl-2-pentanone	0.59	9.8		U
1634-04-4	Methyl-tert-butyl ether	0.56	4.9		U
100-42-5	Styrene	0.33	4.9		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-12

Sample wt/vol: 5.9 (g/mL) G Lab File ID: 0507412A

Level: (low/med) LOW Date Sampled: 05/07/08 15:00

% Moisture: not dec. 13 Date Analyzed: 05/20/08 21:25

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.31	4.9		U
127-18-4	Tetrachloroethene	0.20	4.9		U
108-88-3	Toluene	0.37	4.9		U
87-61-6	1,2,3-Trichlorobenzene	0.18	4.9		U
120-82-1	1,2,4-Trichlorobenzene	0.30	4.9		U
71-55-6	1,1,1-Trichloroethane	0.33	4.9		U
79-00-5	1,1,2-Trichloroethane	0.48	4.9		U
79-01-6	Trichloroethene	0.40	4.9		U
76-13-1	Trichlorotrifluoroethane	0.35	4.9		U
75-69-4	Trichlorofluoromethane	0.40	4.9		U
75-01-4	Vinyl chloride	0.46	4.9		U
1330-20-7	Xylene(total)	0.20	4.9		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB2(0507 2008-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-13

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507413

Level: (low/med) LOW Date Sampled: 05/07/08 :

% Moisture: not dec. _____ Date Analyzed: 05/08/08 11:19

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	1.4	B
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB2(0507 2008-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805074-13

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0507413

Level: (low/med) LOW Date Sampled: 05/07/08 :

% Moisture: not dec. _____ Date Analyzed: 05/08/08 11:19

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-01

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 0509501B

Level: (low/med) LOW Date Sampled: 05/08/08 18:30

% Moisture: not dec. 43 Date Analyzed: 05/20/08 11:36

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.7	17		U
71-43-2	Benzene	0.33	8.6		U
74-97-5	Bromochloromethane	0.60	8.6		U
75-27-4	Bromodichloromethane	0.38	8.6		U
75-25-2	Bromoform	1.0	8.6		U
74-83-9	Bromomethane	0.70	8.6		U
78-93-3	2-Butanone	3.4	17		U
75-15-0	Carbon disulfide	0.46	8.6		U
56-23-5	Carbon tetrachloride	0.41	8.6		U
108-90-7	Chlorobenzene	0.57	8.6		U
75-00-3	Chloroethane	0.69	8.6		U
67-66-3	Chloroform	0.74	8.6		U
74-87-3	Chloromethane	0.62	8.6		U
110-82-7	Cyclohexane	0.72	8.6		U
124-48-1	Dibromochloromethane	0.41	8.6		U
96-12-8	1,2-Dibromo-3-chloropropane	1.2	8.6		U
106-93-4	1,2-Dibromoethane	0.96	8.6		U
95-50-1	1,2-Dichlorobenzene	0.40	8.6		U
541-73-1	1,3-Dichlorobenzene	0.40	8.6		U
106-46-7	1,4-Dichlorobenzene	0.31	8.6		U
75-71-8	Dichlorodifluoromethane	0.52	8.6	4.4	J
75-34-3	1,1-Dichloroethane	0.70	8.6		U
107-06-2	1,2-Dichloroethane	0.74	8.6		U
75-35-4	1,1-Dichloroethene	0.55	8.6		U
156-59-2	cis-1,2-Dichloroethene	0.46	8.6		U
156-60-5	trans-1,2-Dichloroethene	0.94	8.6		U
78-87-5	1,2-Dichloropropane	0.98	8.6		U
10061-01-5	cis-1,3-Dichloropropene	0.60	8.6		U
10061-02-6	trans-1,3-Dichloropropene	0.64	8.6		U
123-91-1	1,4-Dioxane	0.86	86		UY
100-41-4	Ethylbenzene	0.41	8.6		U
591-78-6	2-Hexanone	1.0	17		U
98-82-8	Isopropylbenzene	0.45	8.6		U
79-20-9	Methyl acetate	0.98	8.6		U
108-87-2	Methyl cyclohexane	0.67	8.6		U
75-09-2	Methylene chloride	1.8	8.6	14	B
108-10-1	4-Methyl-2-pentanone	1.0	17		U
1634-04-4	Methyl-tert-butyl ether	0.98	8.6		U
100-42-5	Styrene	0.58	8.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-01

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 0509501B

Level: (low/med) LOW Date Sampled: 05/08/08 18:30

% Moisture: not dec. 43 Date Analyzed: 05/20/08 11:36

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.55	8.6		U
127-18-4	Tetrachloroethene	0.36	8.6		U
108-88-3	Toluene	0.65	8.6		U
87-61-6	1,2,3-Trichlorobenzene	0.33	8.6		U
120-82-1	1,2,4-Trichlorobenzene	0.53	8.6		U
71-55-6	1,1,1-Trichloroethane	0.58	8.6		U
79-00-5	1,1,2-Trichloroethane	0.84	8.6		U
79-01-6	Trichloroethene	0.70	8.6		U
76-13-1	Trichlorotrifluoroethane	0.62	8.6		U
75-69-4	Trichlorofluoromethane	0.70	8.6		U
75-01-4	Vinyl chloride	0.81	8.6		U
1330-20-7	Xylene(total)	0.36	8.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-02

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0509502A

Level: (low/med) LOW Date Sampled: 05/08/08 18:45

% Moisture: not dec. 37 Date Analyzed: 05/20/08 14:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.6	16		U
71-43-2	Benzene	0.31	8.2		U
74-97-5	Bromochloromethane	0.58	8.2		U
75-27-4	Bromodichloromethane	0.36	8.2		U
75-25-2	Bromoform	0.97	8.2		U
74-83-9	Bromomethane	0.67	8.2		U
78-93-3	2-Butanone	3.2	16		U
75-15-0	Carbon disulfide	0.44	8.2		U
56-23-5	Carbon tetrachloride	0.39	8.2		U
108-90-7	Chlorobenzene	0.54	8.2		U
75-00-3	Chloroethane	0.66	8.2		U
67-66-3	Chloroform	0.71	8.2	0.84	J
74-87-3	Chloromethane	0.59	8.2		U
110-82-7	Cyclohexane	0.69	8.2		U
124-48-1	Dibromochloromethane	0.39	8.2		U
96-12-8	1,2-Dibromo-3-chloropropane	1.1	8.2		U
106-93-4	1,2-Dibromoethane	0.92	8.2		U
95-50-1	1,2-Dichlorobenzene	0.38	8.2		U
541-73-1	1,3-Dichlorobenzene	0.38	8.2		U
106-46-7	1,4-Dichlorobenzene	0.30	8.2		U
75-71-8	Dichlorodifluoromethane	0.49	8.2	9.6	
75-34-3	1,1-Dichloroethane	0.67	8.2		U
107-06-2	1,2-Dichloroethane	0.71	8.2		U
75-35-4	1,1-Dichloroethene	0.52	8.2		U
156-59-2	cis-1,2-Dichloroethene	0.44	8.2		U
156-60-5	trans-1,2-Dichloroethene	0.90	8.2		U
78-87-5	1,2-Dichloropropane	0.94	8.2		U
10061-01-5	cis-1,3-Dichloropropene	0.58	8.2		U
10061-02-6	trans-1,3-Dichloropropene	0.61	8.2		U
123-91-1	1,4-Dioxane	0.82	82		UY
100-41-4	Ethylbenzene	0.39	8.2		U
591-78-6	2-Hexanone	1.0	16		U
98-82-8	Isopropylbenzene	0.43	8.2		U
79-20-9	Methyl acetate	0.94	8.2		U
108-87-2	Methyl cyclohexane	0.64	8.2		U
75-09-2	Methylene chloride	1.8	8.2	13	B
108-10-1	4-Methyl-2-pentanone	0.98	16		U
1634-04-4	Methyl-tert-butyl ether	0.94	8.2		U
100-42-5	Styrene	0.56	8.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-02

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0509502A

Level: (low/med) LOW Date Sampled: 05/08/08 18:45

% Moisture: not dec. 37 Date Analyzed: 05/20/08 14:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.52	8.2		U
127-18-4	Tetrachloroethene	0.34	8.2		U
108-88-3	Toluene	0.62	8.2		U
87-61-6	1,2,3-Trichlorobenzene	0.31	8.2		U
120-82-1	1,2,4-Trichlorobenzene	0.51	8.2		U
71-55-6	1,1,1-Trichloroethane	0.56	8.2		U
79-00-5	1,1,2-Trichloroethane	0.80	8.2		U
79-01-6	Trichloroethene	0.67	8.2		U
76-13-1	Trichlorotrifluoroethane	0.59	8.2		U
75-69-4	Trichlorofluoromethane	0.67	8.2		U
75-01-4	Vinyl chloride	0.77	8.2		U
1330-20-7	Xylene(total)	0.34	8.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
10341SB0
02 (1-2)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-03

Sample wt/vol: 6.1 (g/mL) G Lab File ID: 0509503B

Level: (low/med) LOW Date Sampled: 05/08/08 19:00

% Moisture: not dec. 23 Date Analyzed: 05/20/08 12:07

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
67-64-1	Acetone	1.6	11		U
71-43-2	Benzene	0.20	5.3		U
74-97-5	Bromochloromethane	0.37	5.3		U
75-27-4	Bromodichloromethane	0.23	5.3		U
75-25-2	Bromoform	0.62	5.3		U
74-83-9	Bromomethane	0.43	5.3		U
78-93-3	2-Butanone	2.1	11		U
75-15-0	Carbon disulfide	0.29	5.3		U
56-23-5	Carbon tetrachloride	0.25	5.3		U
108-90-7	Chlorobenzene	0.35	5.3		U
75-00-3	Chloroethane	0.42	5.3		U
67-66-3	Chloroform	0.46	5.3		U
74-87-3	Chloromethane	0.38	5.3		U
110-82-7	Cyclohexane	0.44	5.3		U
124-48-1	Dibromochloromethane	0.25	5.3		U
96-12-8	1,2-Dibromo-3-chloropropane	0.72	5.3		U
106-93-4	1,2-Dibromoethane	0.59	5.3		U
95-50-1	1,2-Dichlorobenzene	0.24	5.3		U
541-73-1	1,3-Dichlorobenzene	0.24	5.3		U
106-46-7	1,4-Dichlorobenzene	0.19	5.3		U
75-71-8	Dichlorodifluoromethane	0.32	5.3	3.0	J
75-34-3	1,1-Dichloroethane	0.43	5.3		U
107-06-2	1,2-Dichloroethane	0.46	5.3		U
75-35-4	1,1-Dichloroethene	0.34	5.3		U
156-59-2	cis-1,2-Dichloroethene	0.29	5.3		U
156-60-5	trans-1,2-Dichloroethene	0.58	5.3		U
78-87-5	1,2-Dichloropropane	0.60	5.3		U
10061-01-5	cis-1,3-Dichloropropene	0.37	5.3		U
10061-02-6	trans-1,3-Dichloropropene	0.39	5.3		U
123-91-1	1,4-Dioxane	0.53	53		UY
100-41-4	Ethylbenzene	0.25	5.3		U
591-78-6	2-Hexanone	0.65	11		U
98-82-8	Isopropylbenzene	0.28	5.3		U
79-20-9	Methyl acetate	0.60	5.3		U
108-87-2	Methyl cyclohexane	0.41	5.3		U
75-09-2	Methylene chloride	1.1	5.3	9.8	B
108-10-1	4-Methyl-2-pentanone	0.64	11		U
1634-04-4	Methyl-tert-butyl ether	0.60	5.3		U
100-42-5	Styrene	0.36	5.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
10341SB0
02 (1-2)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-03

Sample wt/vol: 6.1 (g/mL) G Lab File ID: 0509503B

Level: (low/med) LOW Date Sampled: 05/08/08 19:00

% Moisture: not dec. 23 Date Analyzed: 05/20/08 12:07

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.34	5.3		U
127-18-4	Tetrachloroethene	0.22	5.3		U
108-88-3	Toluene	0.40	5.3		U
87-61-6	1,2,3-Trichlorobenzene	0.20	5.3		U
120-82-1	1,2,4-Trichlorobenzene	0.33	5.3		U
71-55-6	1,1,1-Trichloroethane	0.36	5.3		U
79-00-5	1,1,2-Trichloroethane	0.52	5.3		U
79-01-6	Trichloroethene	0.43	5.3		U
76-13-1	Trichlorotrifluoroethane	0.38	5.3		U
75-69-4	Trichlorofluoromethane	0.43	5.3		U
75-01-4	Vinyl chloride	0.50	5.3		U
1330-20-7	Xylene(total)	0.22	5.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB002 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-04

Sample wt/vol: 6.0 (g/mL) G Lab File ID: 0509504A

Level: (low/med) LOW Date Sampled: 05/08/08 19:20

% Moisture: not dec. 23 Date Analyzed: 05/20/08 14:42

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	11		U
71-43-2	Benzene	0.20	5.4		U
74-97-5	Bromochloromethane	0.38	5.4		U
75-27-4	Bromodichloromethane	0.24	5.4		U
75-25-2	Bromoform	0.63	5.4		U
74-83-9	Bromomethane	0.44	5.4		U
78-93-3	2-Butanone	2.1	11		U
75-15-0	Carbon disulfide	0.29	5.4		U
56-23-5	Carbon tetrachloride	0.26	5.4		U
108-90-7	Chlorobenzene	0.35	5.4		U
75-00-3	Chloroethane	0.43	5.4		U
67-66-3	Chloroform	0.46	5.4	6.3	
74-87-3	Chloromethane	0.39	5.4		U
110-82-7	Cyclohexane	0.45	5.4		U
124-48-1	Dibromochloromethane	0.26	5.4		U
96-12-8	1,2-Dibromo-3-chloropropane	0.73	5.4		U
106-93-4	1,2-Dibromoethane	0.60	5.4		U
95-50-1	1,2-Dichlorobenzene	0.25	5.4		U
541-73-1	1,3-Dichlorobenzene	0.25	5.4		U
106-46-7	1,4-Dichlorobenzene	0.19	5.4		U
75-71-8	Dichlorodifluoromethane	0.32	5.4		U
75-34-3	1,1-Dichloroethane	0.44	5.4		U
107-06-2	1,2-Dichloroethane	0.46	5.4		U
75-35-4	1,1-Dichloroethene	0.34	5.4		U
156-59-2	cis-1,2-Dichloroethene	0.29	5.4		U
156-60-5	trans-1,2-Dichloroethene	0.59	5.4		U
78-87-5	1,2-Dichloropropane	0.61	5.4		U
10061-01-5	cis-1,3-Dichloropropene	0.38	5.4		U
10061-02-6	trans-1,3-Dichloropropene	0.40	5.4		U
123-91-1	1,4-Dioxane	0.54	54		UY
100-41-4	Ethylbenzene	0.26	5.4		U
591-78-6	2-Hexanone	0.66	11		U
98-82-8	Isopropylbenzene	0.28	5.4		U
79-20-9	Methyl acetate	0.61	5.4		U
108-87-2	Methyl cyclohexane	0.42	5.4		U
75-09-2	Methylene chloride	1.2	5.4	6.5	B
108-10-1	4-Methyl-2-pentanone	0.64	11		U
1634-04-4	Methyl-tert-butyl ether	0.61	5.4		U
100-42-5	Styrene	0.36	5.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB002 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-04

Sample wt/vol: 6.0 (g/mL) G Lab File ID: 0509504A

Level: (low/med) LOW Date Sampled: 05/08/08 19:20

% Moisture: not dec. 23 Date Analyzed: 05/20/08 14:42

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.34	5.4		U
127-18-4	Tetrachloroethene	0.22	5.4		U
108-88-3	Toluene	0.41	5.4		U
87-61-6	1,2,3-Trichlorobenzene	0.20	5.4		U
120-82-1	1,2,4-Trichlorobenzene	0.33	5.4		U
71-55-6	1,1,1-Trichloroethane	0.36	5.4		U
79-00-5	1,1,2-Trichloroethane	0.53	5.4		U
79-01-6	Trichloroethene	0.44	5.4		U
76-13-1	Trichlorotrifluoroethane	0.39	5.4		U
75-69-4	Trichlorofluoromethane	0.44	5.4		U
75-01-4	Vinyl chloride	0.50	5.4		U
1330-20-7	Xylene(total)	0.22	5.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP002
(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805095-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0509505

Level: (low/med) LOW Date Sampled: 05/08/08 11:00

% Moisture: not dec. _____ Date Analyzed: 05/14/08 13:14

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		UY
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	42	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.31	JB
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP002
(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805095-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0509505

Level: (low/med) LOW Date Sampled: 05/08/08 11:00

% Moisture: not dec. _____ Date Analyzed: 05/14/08 13:14

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB3 (050 62008-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805095-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0509506

Level: (low/med) LOW Date Sampled: 05/08/08 :

% Moisture: not dec. _____ Date Analyzed: 05/14/08 10:18

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		UY
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.60	JB
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB3 (050 62008-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805095-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0509506

Level: (low/med) LOW Date Sampled: 05/08/08 :

% Moisture: not dec. _____ Date Analyzed: 05/14/08 10:18

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-07

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0509507B

Level: (low/med) LOW Date Sampled: 05/08/08 13:50

% Moisture: not dec. 23 Date Analyzed: 05/20/08 12:38

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.1	13		U
71-43-2	Benzene	0.25	6.6		U
74-97-5	Bromochloromethane	0.46	6.6		U
75-27-4	Bromodichloromethane	0.29	6.6		U
75-25-2	Bromoform	0.78	6.6		U
74-83-9	Bromomethane	0.54	6.6		U
78-93-3	2-Butanone	2.6	13		U
75-15-0	Carbon disulfide	0.36	6.6		U
56-23-5	Carbon tetrachloride	0.32	6.6		U
108-90-7	Chlorobenzene	0.44	6.6		U
75-00-3	Chloroethane	0.53	6.6		U
67-66-3	Chloroform	0.57	6.6		U
74-87-3	Chloromethane	0.48	6.6		U
110-82-7	Cyclohexane	0.56	6.6		U
124-48-1	Dibromochloromethane	0.32	6.6		U
96-12-8	1,2-Dibromo-3-chloropropane	0.90	6.6		U
106-93-4	1,2-Dibromoethane	0.74	6.6		U
95-50-1	1,2-Dichlorobenzene	0.30	6.6		U
541-73-1	1,3-Dichlorobenzene	0.30	6.6		U
106-46-7	1,4-Dichlorobenzene	0.24	6.6		U
75-71-8	Dichlorodifluoromethane	0.40	6.6	8.3	
75-34-3	1,1-Dichloroethane	0.54	6.6		U
107-06-2	1,2-Dichloroethane	0.57	6.6		U
75-35-4	1,1-Dichloroethene	0.42	6.6		U
156-59-2	cis-1,2-Dichloroethene	0.36	6.6		U
156-60-5	trans-1,2-Dichloroethene	0.73	6.6		U
78-87-5	1,2-Dichloropropane	0.76	6.6		U
10061-01-5	cis-1,3-Dichloropropene	0.46	6.6		U
10061-02-6	trans-1,3-Dichloropropene	0.49	6.6		U
123-91-1	1,4-Dioxane	0.66	66		UY
100-41-4	Ethylbenzene	0.32	6.6		U
591-78-6	2-Hexanone	0.81	13		U
98-82-8	Isopropylbenzene	0.34	6.6		U
79-20-9	Methyl acetate	0.76	6.6		U
108-87-2	Methyl cyclohexane	0.52	6.6		U
75-09-2	Methylene chloride	1.4	6.6	6.1	JB
108-10-1	4-Methyl-2-pentanone	0.80	13		U
1634-04-4	Methyl-tert-butyl ether	0.76	6.6		U
100-42-5	Styrene	0.45	6.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-07

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0509507B

Level: (low/med) LOW Date Sampled: 05/08/08 13:50

% Moisture: not dec. 23 Date Analyzed: 05/20/08 12:38

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.42	6.6		U
127-18-4	Tetrachloroethene	0.28	6.6		U
108-88-3	Toluene	0.50	6.6		U
87-61-6	1,2,3-Trichlorobenzene	0.25	6.6		U
120-82-1	1,2,4-Trichlorobenzene	0.41	6.6		U
71-55-6	1,1,1-Trichloroethane	0.45	6.6		U
79-00-5	1,1,2-Trichloroethane	0.65	6.6		U
79-01-6	Trichloroethene	0.54	6.6		U
76-13-1	Trichlorotrifluoroethane	0.48	6.6		U
75-69-4	Trichlorofluoromethane	0.54	6.6		U
75-01-4	Vinyl chloride	0.62	6.6		U
1330-20-7	Xylene(total)	0.28	6.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-08

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0509508A

Level: (low/med) LOW Date Sampled: 05/08/08 14:00

% Moisture: not dec. 31 Date Analyzed: 05/20/08 15:13

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
67-64-1	Acetone	2.4	16		U
71-43-2	Benzene	0.29	7.8		U
74-97-5	Bromochloromethane	0.54	7.8		U
75-27-4	Bromodichloromethane	0.34	7.8		U
75-25-2	Bromoform	0.91	7.8		U
74-83-9	Bromomethane	0.64	7.8		U
78-93-3	2-Butanone	3.0	16		U
75-15-0	Carbon disulfide	0.42	7.8		U
56-23-5	Carbon tetrachloride	0.37	7.8		U
108-90-7	Chlorobenzene	0.51	7.8		U
75-00-3	Chloroethane	0.62	7.8		U
67-66-3	Chloroform	0.67	7.8		U
74-87-3	Chloromethane	0.56	7.8	0.66	JB
110-82-7	Cyclohexane	0.65	7.8		U
124-48-1	Dibromochloromethane	0.37	7.8		U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	7.8		U
106-93-4	1,2-Dibromoethane	0.87	7.8		U
95-50-1	1,2-Dichlorobenzene	0.36	7.8		U
541-73-1	1,3-Dichlorobenzene	0.36	7.8		U
106-46-7	1,4-Dichlorobenzene	0.28	7.8		U
75-71-8	Dichlorodifluoromethane	0.46	7.8		U
75-34-3	1,1-Dichloroethane	0.64	7.8		U
107-06-2	1,2-Dichloroethane	0.67	7.8		U
75-35-4	1,1-Dichloroethene	0.50	7.8		U
156-59-2	cis-1,2-Dichloroethene	0.42	7.8		U
156-60-5	trans-1,2-Dichloroethene	0.85	7.8		U
78-87-5	1,2-Dichloropropane	0.88	7.8		U
10061-01-5	cis-1,3-Dichloropropene	0.54	7.8		U
10061-02-6	trans-1,3-Dichloropropene	0.57	7.8		U
123-91-1	1,4-Dioxane	0.78	78		UY
100-41-4	Ethylbenzene	0.37	7.8		U
591-78-6	2-Hexanone	0.94	16		U
98-82-8	Isopropylbenzene	0.40	7.8		U
79-20-9	Methyl acetate	0.88	7.8		U
108-87-2	Methyl cyclohexane	0.60	7.8		U
75-09-2	Methylene chloride	1.7	7.8	14	B
108-10-1	4-Methyl-2-pentanone	0.93	16		U
1634-04-4	Methyl-tert-butyl ether	0.88	7.8		U
100-42-5	Styrene	0.53	7.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-08

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0509508A

Level: (low/med) LOW Date Sampled: 05/08/08 14:00

% Moisture: not dec. 31 Date Analyzed: 05/20/08 15:13

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.50	7.8		U
127-18-4	Tetrachloroethene	0.32	7.8		U
108-88-3	Toluene	0.59	7.8		U
87-61-6	1,2,3-Trichlorobenzene	0.29	7.8		U
120-82-1	1,2,4-Trichlorobenzene	0.48	7.8		U
71-55-6	1,1,1-Trichloroethane	0.53	7.8		U
79-00-5	1,1,2-Trichloroethane	0.76	7.8		U
79-01-6	Trichloroethene	0.64	7.8		U
76-13-1	Trichlorotrifluoroethane	0.56	7.8		U
75-69-4	Trichlorofluoromethane	0.64	7.8		U
75-01-4	Vinyl chloride	0.73	7.8		U
1330-20-7	Xylene(total)	0.32	7.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-09

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0509509B

Level: (low/med) LOW Date Sampled: 05/08/08 14:30

% Moisture: not dec. 21 Date Analyzed: 05/20/08 13:09

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.8	11		U
71-43-2	Benzene	0.21	5.6		U
74-97-5	Bromochloromethane	0.39	5.6		U
75-27-4	Bromodichloromethane	0.25	5.6		U
75-25-2	Bromoform	0.66	5.6		U
74-83-9	Bromomethane	0.46	5.6		U
78-93-3	2-Butanone	2.2	11		U
75-15-0	Carbon disulfide	0.30	5.6	0.32	J
56-23-5	Carbon tetrachloride	0.27	5.6		U
108-90-7	Chlorobenzene	0.37	5.6		U
75-00-3	Chloroethane	0.45	5.6		U
67-66-3	Chloroform	0.48	5.6		U
74-87-3	Chloromethane	0.40	5.6		U
110-82-7	Cyclohexane	0.47	5.6		U
124-48-1	Dibromochloromethane	0.27	5.6		U
96-12-8	1,2-Dibromo-3-chloropropane	0.76	5.6		U
106-93-4	1,2-Dibromoethane	0.63	5.6		U
95-50-1	1,2-Dichlorobenzene	0.26	5.6		U
541-73-1	1,3-Dichlorobenzene	0.26	5.6		U
106-46-7	1,4-Dichlorobenzene	0.20	5.6		U
75-71-8	Dichlorodifluoromethane	0.34	5.6		U
75-34-3	1,1-Dichloroethane	0.46	5.6		U
107-06-2	1,2-Dichloroethane	0.48	5.6		U
75-35-4	1,1-Dichloroethene	0.36	5.6		U
156-59-2	cis-1,2-Dichloroethene	0.30	5.6		U
156-60-5	trans-1,2-Dichloroethene	0.62	5.6		U
78-87-5	1,2-Dichloropropane	0.64	5.6		U
10061-01-5	cis-1,3-Dichloropropene	0.39	5.6		U
10061-02-6	trans-1,3-Dichloropropene	0.42	5.6		U
123-91-1	1,4-Dioxane	0.56	56		UY
100-41-4	Ethylbenzene	0.27	5.6		U
591-78-6	2-Hexanone	0.68	11		U
98-82-8	Isopropylbenzene	0.29	5.6		U
79-20-9	Methyl acetate	0.64	5.6		U
108-87-2	Methyl cyclohexane	0.44	5.6	0.90	J
75-09-2	Methylene chloride	1.2	5.6	12	B
108-10-1	4-Methyl-2-pentanone	0.67	11		U
1634-04-4	Methyl-tert-butyl ether	0.64	5.6		U
100-42-5	Styrene	0.38	5.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-09

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0509509B

Level: (low/med) LOW Date Sampled: 05/08/08 14:30

% Moisture: not dec. 21 Date Analyzed: 05/20/08 13:09

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.36	5.6		U
127-18-4	Tetrachloroethene	0.24	5.6		U
108-88-3	Toluene	0.43	5.6		U
87-61-6	1,2,3-Trichlorobenzene	0.21	5.6		U
120-82-1	1,2,4-Trichlorobenzene	0.35	5.6		U
71-55-6	1,1,1-Trichloroethane	0.38	5.6		U
79-00-5	1,1,2-Trichloroethane	0.55	5.6		U
79-01-6	Trichloroethene	0.46	5.6		U
76-13-1	Trichlorotrifluoroethane	0.40	5.6		U
75-69-4	Trichlorofluoromethane	0.46	5.6		U
75-01-4	Vinyl chloride	0.53	5.6		U
1330-20-7	Xylene(total)	0.24	5.6	1.2	J

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-10

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0509510A

Level: (low/med) LOW Date Sampled: 05/08/08 14:50

% Moisture: not dec. 27 Date Analyzed: 05/20/08 15:44

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.9	12		U
71-43-2	Benzene	0.23	6.1		U
74-97-5	Bromochloromethane	0.43	6.1		U
75-27-4	Bromodichloromethane	0.27	6.1		U
75-25-2	Bromoform	0.72	6.1		U
74-83-9	Bromomethane	0.50	6.1		U
78-93-3	2-Butanone	2.4	12		U
75-15-0	Carbon disulfide	0.33	6.1		U
56-23-5	Carbon tetrachloride	0.29	6.1		U
108-90-7	Chlorobenzene	0.40	6.1		U
75-00-3	Chloroethane	0.49	6.1		U
67-66-3	Chloroform	0.52	6.1	5.8	J
74-87-3	Chloromethane	0.44	6.1	0.61	JB
110-82-7	Cyclohexane	0.51	6.1		U
124-48-1	Dibromochloromethane	0.29	6.1		U
96-12-8	1,2-Dibromo-3-chloropropane	0.83	6.1		U
106-93-4	1,2-Dibromoethane	0.68	6.1		U
95-50-1	1,2-Dichlorobenzene	0.28	6.1		U
541-73-1	1,3-Dichlorobenzene	0.28	6.1		U
106-46-7	1,4-Dichlorobenzene	0.22	6.1		U
75-71-8	Dichlorodifluoromethane	0.36	6.1		U
75-34-3	1,1-Dichloroethane	0.50	6.1		U
107-06-2	1,2-Dichloroethane	0.52	6.1		U
75-35-4	1,1-Dichloroethene	0.39	6.1		U
156-59-2	cis-1,2-Dichloroethene	0.33	6.1		U
156-60-5	trans-1,2-Dichloroethene	0.67	6.1		U
78-87-5	1,2-Dichloropropane	0.69	6.1		U
10061-01-5	cis-1,3-Dichloropropene	0.43	6.1		U
10061-02-6	trans-1,3-Dichloropropene	0.45	6.1		U
123-91-1	1,4-Dioxane	0.61	61		UY
100-41-4	Ethylbenzene	0.29	6.1		U
591-78-6	2-Hexanone	0.74	12		U
98-82-8	Isopropylbenzene	0.32	6.1		U
79-20-9	Methyl acetate	0.69	6.1		U
108-87-2	Methyl cyclohexane	0.48	6.1		U
75-09-2	Methylene chloride	1.3	6.1	11	B
108-10-1	4-Methyl-2-pentanone	0.73	12		U
1634-04-4	Methyl-tert-butyl ether	0.69	6.1		U
100-42-5	Styrene	0.41	6.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-10

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0509510A

Level: (low/med) LOW Date Sampled: 05/08/08 14:50

% Moisture: not dec. 27 Date Analyzed: 05/20/08 15:44

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.39	6.1		U
127-18-4	Tetrachloroethene	0.26	6.1		U
108-88-3	Toluene	0.46	6.1		U
87-61-6	1,2,3-Trichlorobenzene	0.23	6.1		U
120-82-1	1,2,4-Trichlorobenzene	0.38	6.1		U
71-55-6	1,1,1-Trichloroethane	0.41	6.1		U
79-00-5	1,1,2-Trichloroethane	0.60	6.1		U
79-01-6	Trichloroethene	0.50	6.1		U
76-13-1	Trichlorotrifluoroethane	0.44	6.1		U
75-69-4	Trichlorofluoromethane	0.50	6.1		U
75-01-4	Vinyl chloride	0.57	6.1		U
1330-20-7	Xylene(total)	0.26	6.1		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB008
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0509511B

Level: (low/med) LOW Date Sampled: 05/08/08 15:20

% Moisture: not dec. 16 Date Analyzed: 05/20/08 13:40

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.0	13		U
71-43-2	Benzene	0.24	6.4		U
74-97-5	Bromochloromethane	0.44	6.4		U
75-27-4	Bromodichloromethane	0.28	6.4		U
75-25-2	Bromoform	0.75	6.4		U
74-83-9	Bromomethane	0.52	6.4		U
78-93-3	2-Butanone	2.5	13		U
75-15-0	Carbon disulfide	0.34	6.4		U
56-23-5	Carbon tetrachloride	0.30	6.4		U
108-90-7	Chlorobenzene	0.42	6.4		U
75-00-3	Chloroethane	0.51	6.4		U
67-66-3	Chloroform	0.55	6.4		U
74-87-3	Chloromethane	0.46	6.4		U
110-82-7	Cyclohexane	0.53	6.4		U
124-48-1	Dibromochloromethane	0.30	6.4		U
96-12-8	1,2-Dibromo-3-chloropropane	0.86	6.4		U
106-93-4	1,2-Dibromoethane	0.71	6.4		U
95-50-1	1,2-Dichlorobenzene	0.29	6.4		U
541-73-1	1,3-Dichlorobenzene	0.29	6.4		U
106-46-7	1,4-Dichlorobenzene	0.23	6.4		U
75-71-8	Dichlorodifluoromethane	0.38	6.4	14	
75-34-3	1,1-Dichloroethane	0.52	6.4		U
107-06-2	1,2-Dichloroethane	0.55	6.4		U
75-35-4	1,1-Dichloroethene	0.41	6.4		U
156-59-2	cis-1,2-Dichloroethene	0.34	6.4		U
156-60-5	trans-1,2-Dichloroethene	0.70	6.4		U
78-87-5	1,2-Dichloropropane	0.72	6.4		U
10061-01-5	cis-1,3-Dichloropropene	0.44	6.4		U
10061-02-6	trans-1,3-Dichloropropene	0.47	6.4		U
123-91-1	1,4-Dioxane	0.64	64		UY
100-41-4	Ethylbenzene	0.30	6.4		U
591-78-6	2-Hexanone	0.78	13		U
98-82-8	Isopropylbenzene	0.33	6.4		U
79-20-9	Methyl acetate	0.72	6.4		U
108-87-2	Methyl cyclohexane	0.50	6.4		U
75-09-2	Methylene chloride	1.4	6.4	11	B
108-10-1	4-Methyl-2-pentanone	0.76	13		U
1634-04-4	Methyl-tert-butyl ether	0.72	6.4		U
100-42-5	Styrene	0.43	6.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0509511B

Level: (low/med) LOW Date Sampled: 05/08/08 15:20

% Moisture: not dec. 16 Date Analyzed: 05/20/08 13:40

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.41	6.4		U
127-18-4	Tetrachloroethene	0.27	6.4		U
108-88-3	Toluene	0.48	6.4		U
87-61-6	1,2,3-Trichlorobenzene	0.24	6.4		U
120-82-1	1,2,4-Trichlorobenzene	0.39	6.4		U
71-55-6	1,1,1-Trichloroethane	0.43	6.4		U
79-00-5	1,1,2-Trichloroethane	0.62	6.4		U
79-01-6	Trichloroethene	0.52	6.4		U
76-13-1	Trichlorotrifluoroethane	0.46	6.4		U
75-69-4	Trichlorofluoromethane	0.52	6.4		U
75-01-4	Vinyl chloride	0.60	6.4		U
1330-20-7	Xylene(total)	0.27	6.4		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008 (4-5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-12

Sample wt/vol: 5.7 (g/mL) G Lab File ID: 0509512A

Level: (low/med) LOW Date Sampled: 05/08/08 15:30

% Moisture: not dec. 15 Date Analyzed: 05/20/08 16:15

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.6	10		U
71-43-2	Benzene	0.20	5.2		U
74-97-5	Bromochloromethane	0.36	5.2		U
75-27-4	Bromodichloromethane	0.23	5.2		U
75-25-2	Bromoform	0.61	5.2		U
74-83-9	Bromomethane	0.42	5.2		U
78-93-3	2-Butanone	2.0	10		U
75-15-0	Carbon disulfide	0.28	5.2		U
56-23-5	Carbon tetrachloride	0.25	5.2		U
108-90-7	Chlorobenzene	0.34	5.2		U
75-00-3	Chloroethane	0.41	5.2		U
67-66-3	Chloroform	0.44	5.2	4.2	J
74-87-3	Chloromethane	0.37	5.2		U
110-82-7	Cyclohexane	0.43	5.2		U
124-48-1	Dibromochloromethane	0.25	5.2		U
96-12-8	1,2-Dibromo-3-chloropropane	0.70	5.2		U
106-93-4	1,2-Dibromoethane	0.58	5.2		U
95-50-1	1,2-Dichlorobenzene	0.24	5.2		U
541-73-1	1,3-Dichlorobenzene	0.24	5.2		U
106-46-7	1,4-Dichlorobenzene	0.18	5.2		U
75-71-8	Dichlorodifluoromethane	0.31	5.2	17	
75-34-3	1,1-Dichloroethane	0.42	5.2		U
107-06-2	1,2-Dichloroethane	0.44	5.2		U
75-35-4	1,1-Dichloroethene	0.33	5.2		U
156-59-2	cis-1,2-Dichloroethene	0.28	5.2		U
156-60-5	trans-1,2-Dichloroethene	0.57	5.2		U
78-87-5	1,2-Dichloropropane	0.59	5.2		U
10061-01-5	cis-1,3-Dichloropropene	0.36	5.2		U
10061-02-6	trans-1,3-Dichloropropene	0.38	5.2		U
123-91-1	1,4-Dioxane	0.52	52		UY
100-41-4	Ethylbenzene	0.25	5.2		U
591-78-6	2-Hexanone	0.63	10		U
98-82-8	Isopropylbenzene	0.27	5.2		U
79-20-9	Methyl acetate	0.59	5.2		U
108-87-2	Methyl cyclohexane	0.40	5.2		U
75-09-2	Methylene chloride	1.1	5.2	6.4	B
108-10-1	4-Methyl-2-pentanone	0.62	10		U
1634-04-4	Methyl-tert-butyl ether	0.59	5.2		U
100-42-5	Styrene	0.35	5.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008 (4-5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-12

Sample wt/vol: 5.7 (g/mL) G Lab File ID: 0509512A

Level: (low/med) LOW Date Sampled: 05/08/08 15:30

% Moisture: not dec. 15 Date Analyzed: 05/20/08 16:15

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.33	5.2		U
127-18-4	Tetrachloroethene	0.22	5.2		U
108-88-3	Toluene	0.39	5.2		U
87-61-6	1,2,3-Trichlorobenzene	0.20	5.2		U
120-82-1	1,2,4-Trichlorobenzene	0.32	5.2		U
71-55-6	1,1,1-Trichloroethane	0.35	5.2		U
79-00-5	1,1,2-Trichloroethane	0.50	5.2		U
79-01-6	Trichloroethene	0.42	5.2		U
76-13-1	Trichlorotrifluoroethane	0.37	5.2		U
75-69-4	Trichlorofluoromethane	0.42	5.2		U
75-01-4	Vinyl chloride	0.48	5.2		U
1330-20-7	Xylene(total)	0.22	5.2		U

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Level: (low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V1BLK0509LCS	94	99	98	97	0
02	V1BLK0509	102	85	97	93	0
03	1549SB003(0.	104	101	96	95	0
04	1549SB001(0.	104	102	96	96	0
05	1549DUP002(0	100	101	94	97	0
06	1549SB004(0.	101	100	95	96	0
07	1549SB006(0.	102	104	97	100	0
08	V5BLK0520LCS	92	100	101	98	0
09	V5BLK0520	90	104	99	97	0
10	5DITCHSB003(	112	112	101	102	0
11	5DITCHSB004(	112	109	100	99	0
12	1034SB004 (0	93	108	103	101	0
13	10341SB002 (	116	111	103	99	0
14	1041SB004 (0	103	109	102	92	0
15	1034SB001 (0	102	117	101	96	0
16	1034SB008 (0	116	112	100	100	0
17	1034SB004 (5	109	111	102	96	0
18	1041SB002 (7	104	121	103	101	0
19	1041SB004 (7	98	115	102	96	0
20	1034SB001 (7	101	119	101	98	0
21	1034SB008 (4	92	110	104	102	0
22	V5BLK0520ELC	101	101	97	100	0
23	V5BLK0520E	92	108	98	102	0
24	1549SB001(7-	92	105	99	104	0
25	1549SB004(5-	97	116	107	107	0
26	1549SB006(5-	94	109	100	104	0
27	1549SB003(5-	96	114	100	101	0
28						
29						
30						

		EL QC LIMITS	SPIKE CONC (ug/Kg)
SMC1 (DFM)	= Dibromofluoromethane	(80-125)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(75-140)	30
SMC3 (TOL)	= Toluene-d8	(80-120)	30
SMC4 (BFB)	= Bromofluorobenzene	(80-125)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V4BLK0508LCS	99	93	104	105	0
02	V4BLK0508	99	93	108	106	0
03	TB-1(0506200	98	92	100	100	0
04	TB2(05072008	102	93	105	102	0
05	5DITCHP002(0	101	92	102	102	0
06	5DITCHP001(0	102	96	103	105	0
07	5DITCHHP003(	106	95	102	103	0
08	5DITCHHP004(	101	93	107	103	0
09	5DUP001(0506	105	96	103	102	0
10	V4BLK0508LCS	97	91	98	111	0
11	V4BLK0514LCS	100	92	101	100	0
12	V4BLK0514	98	94	103	103	0
13	TB3 (0506200	103	93	107	100	0
14	1041HP002 (0	100	88	107	104	0
15	V4BLK0514LCS	101	92	94	104	0
16						
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30						

		EL QC LIMITS	SPIKE CONC (ug/L)
SMC1 (DFM)	= Dibromofluoromethane	(85-120)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(80-135)	30
SMC3 (TOL)	= Toluene-d8	(85-115)	30
SMC4 (BFB)	= Bromofluorobenzene	(85-120)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0508

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	77.02	77	40-140
Benzene	50.00	0.0000	42.32	85	80-120
Bromochloromethane	50.00	0.0000	44.21	88	65-130
Bromodichloromethane	50.00	0.0000	44.96	90	75-120
Bromoform	50.00	0.0000	47.61	95	70-130
Bromomethane	50.00	0.0000	46.54	93	30-145
2-Butanone	100.0	0.0000	137.0	137	30-150
Carbon disulfide	50.00	0.0000	46.58	93	35-160
Carbon tetrachloride	50.00	0.0000	45.64	91	65-140
Chlorobenzene	50.00	0.0000	47.77	96	80-120
Chloroethane	50.00	0.0000	46.45	93	60-135
Chloroform	50.00	0.0000	42.74	85	65-135
Chloromethane	50.00	0.0000	63.14	126*	40-125
Cyclohexane	50.00	0.0000	45.55	91	60-130
Dibromochloromethane	50.00	0.0000	48.85	98	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	46.13	92	50-130
1,2-Dibromoethane	50.00	0.0000	45.72	91	80-120
1,2-Dichlorobenzene	50.00	0.0000	47.37	95	70-120
1,3-Dichlorobenzene	50.00	0.0000	48.47	97	75-125
1,4-Dichlorobenzene	50.00	0.0000	47.17	94	75-125
Dichlorodifluoromethane	50.00	0.0000	67.41	135	30-155
1,1-Dichloroethane	50.00	0.0000	39.70	79	70-135
1,2-Dichloroethane	50.00	0.0000	45.30	91	70-130
1,1-Dichloroethene	50.00	0.0000	42.69	85	70-130
cis-1,2-Dichloroethene	50.00	0.0000	42.19	84	70-125
trans-1,2-Dichloroethen	50.00	0.0000	43.00	86	60-140
1,2-Dichloropropane	50.00	0.0000	43.24	86	75-125
cis-1,3-Dichloropropene	50.00	0.0000	43.75	88	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0508

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	50.46	101	55-140
1,4-Dioxane	1000	0.0000	780.2	78	50-150
Ethylbenzene	50.00	0.0000	49.16	98	75-125
2-Hexanone	100.0	0.0000	83.90	84	55-130
Isopropylbenzene	50.00	0.0000	52.91	106	75-125
Methyl acetate	50.00	0.0000	51.43	103	55-150
Methyl cyclohexane	50.00	0.0000	43.57	87	60-125
Methylene chloride	50.00	0.5296	44.00	87	55-140
4-Methyl-2-pentanone	100.0	0.0000	85.61	86	60-135
Methyl-tert-butyl ether	50.00	0.0000	41.36	83	65-125
Styrene	50.00	0.0000	51.58	103	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	42.07	84	65-130
Tetrachloroethene	55.00	0.0000	55.69	101	45-150
Toluene	50.00	0.0000	48.34	97	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	44.78	90	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	44.26	88	65-135
1,1,1-Trichloroethane	50.00	0.0000	45.90	92	65-130
1,1,2-Trichloroethane	50.00	0.0000	47.16	94	75-125
Trichloroethene	50.00	0.0000	46.92	94	70-125
Trichlorotrifluoroethan	50.00	0.0000	46.73	93	60-130
Trichlorofluoromethane	50.00	0.0000	50.98	102	60-145
Vinyl chloride	50.00	0.0000	48.27	96	50-145
Xylene(total)	150.0	0.0000	146.2	97	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0508

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acetone	100.0	82.43	82	7	30	40-140
Benzene	50.00	46.51	93	9	30	80-120
Bromochloromethane	50.00	44.47	89	0	30	65-130
Bromodichloromethane	50.00	51.08	102	13	30	75-120
Bromoform	50.00	47.31	95	1	30	70-130
Bromomethane	50.00	37.49	75	22	30	30-145
2-Butanone	100.0	156.1	156*	13	30	30-150
Carbon disulfide	50.00	49.39	99	6	30	35-160
Carbon tetrachloride	50.00	51.48	103	12	30	65-140
Chlorobenzene	50.00	47.06	94	1	30	80-120
Chloroethane	50.00	48.22	96	4	30	60-135
Chloroform	50.00	48.27	96	12	30	65-135
Chloromethane	50.00	76.19	152*	19	30	40-125
Cyclohexane	50.00	49.59	99	8	30	60-130
Dibromochloromethane	50.00	49.36	99	1	30	60-135
1,2-Dibromo-3-chloropro	50.00	49.82	100	8	30	50-130
1,2-Dibromoethane	50.00	47.15	94	3	30	80-120
1,2-Dichlorobenzene	50.00	48.38	97	2	30	70-120
1,3-Dichlorobenzene	50.00	46.62	93	4	30	75-125
1,4-Dichlorobenzene	50.00	52.43	105	10	30	75-125
Dichlorodifluoromethane	50.00	80.28	160*	17	30	30-155
1,1-Dichloroethane	50.00	44.90	90	12	30	70-135
1,2-Dichloroethane	50.00	54.62	109	19	30	70-130
1,1-Dichloroethene	50.00	43.16	86	1	30	70-130
cis-1,2-Dichloroethene	50.00	44.68	89	6	30	70-125
trans-1,2-Dichloroethen	50.00	44.66	89	4	30	60-140
1,2-Dichloropropane	50.00	48.19	96	11	30	75-125
cis-1,3-Dichloropropene	50.00	49.43	99	12	30	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0508

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
trans-1,3-Dichloroprope	50.00	53.76	108	6	30	55-140
1,4-Dioxane	1000	743.2	74	5	30	50-150
Ethylbenzene	50.00	49.94	100	2	30	75-125
2-Hexanone	100.0	96.70	97	14	30	55-130
Isopropylbenzene	50.00	56.62	113	7	30	75-125
Methyl acetate	50.00	59.57	119	15	30	55-150
Methyl cyclohexane	50.00	45.59	91	4	30	60-125
Methylene chloride	50.00	46.14	91	5	30	55-140
4-Methyl-2-pentanone	100.0	109.1	109	24	30	60-135
Methyl-tert-butyl ether	50.00	45.16	90	9	30	65-125
Styrene	50.00	51.47	103	0	30	65-135
1,1,2,2-Tetrachloroetha	50.00	46.58	93	10	30	65-130
Tetrachloroethene	55.00	50.62	92	10	30	45-150
Toluene	50.00	47.21	94	2	30	75-120
1,2,3-Trichlorobenzene	50.00	47.78	96	6	30	55-140
1,2,4-Trichlorobenzene	50.00	45.89	92	4	30	65-135
1,1,1-Trichloroethane	50.00	51.52	103	12	30	65-130
1,1,2-Trichloroethane	50.00	48.93	98	4	30	75-125
Trichloroethene	50.00	48.48	97	3	30	70-125
Trichlorotrifluoroethan	50.00	49.71	99	6	30	60-130
Trichlorofluoromethane	50.00	58.22	116	13	30	60-145
Vinyl chloride	50.00	56.43	113	16	30	50-145
Xylene(total)	150.0	150.8	100	3	30	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 51 outside limits
Spike Recovery: 4 out of 102 outside limits

COMMENTS: _____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V1BLK0509 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	110.4	110	20-160
Benzene	50.00	0.0000	47.03	94	75-125
Bromochloromethane	50.00	0.0000	41.38	83	70-125
Bromodichloromethane	50.00	0.0000	50.99	102	70-130
Bromoform	50.00	0.0000	46.71	93	55-135
Bromomethane	50.00	0.0000	52.06	104	30-160
2-Butanone	100.0	0.0000	197.4	197*	30-160
Carbon disulfide	50.00	0.0000	49.93	100	45-160
Carbon tetrachloride	50.00	0.0000	43.22	86	65-135
Chlorobenzene	50.00	0.0000	44.02	88	75-125
Chloroethane	50.00	0.0000	52.31	105	40-155
Chloroform	50.00	0.0000	46.94	94	70-125
Chloromethane	50.00	0.0000	58.27	116	50-130
Cyclohexane	50.00	0.0000	50.47	101	65-140
Dibromochloromethane	50.00	0.0000	43.63	87	65-130
1,2-Dibromo-3-chloropro	50.00	0.0000	49.13	98	40-135
1,2-Dibromoethane	50.00	0.0000	46.92	94	70-125
1,2-Dichlorobenzene	50.00	0.0000	47.52	95	75-120
1,3-Dichlorobenzene	50.00	0.0000	44.97	90	70-125
1,4-Dichlorobenzene	50.00	0.0000	47.56	95	70-125
Dichlorodifluoromethane	50.00	0.0000	57.95	116	35-135
1,1-Dichloroethane	50.00	0.0000	50.33	101	75-125
1,2-Dichloroethane	50.00	0.0000	54.67	109	70-125
1,1-Dichloroethene	50.00	0.0000	41.66	83	65-135
cis-1,2-Dichloroethene	50.00	0.0000	41.96	84	65-125
trans-1,2-Dichloroethen	50.00	0.0000	40.17	80	65-135
1,2-Dichloropropane	50.00	0.0000	51.36	103	70-120
cis-1,3-Dichloropropene	50.00	0.0000	50.76	102	70-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

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FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V1BLK0509 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	55.04	110	65-125
1,4-Dioxane	1000	0.0000	817.3	82	50-150
Ethylbenzene	50.00	0.0000	44.57	89	75-125
2-Hexanone	100.0	0.0000	115.1	115	45-145
Isopropylbenzene	50.00	0.0000	46.88	94	75-130
Methyl acetate	50.00	0.0000	77.19	154	45-265
Methyl cyclohexane	50.00	0.0000	46.92	94	65-135
Methylene chloride	50.00	2.713	46.74	88	55-140
4-Methyl-2-pentanone	100.0	0.0000	118.8	119	45-145
Methyl-tert-butyl ether	50.00	0.0000	48.29	96	55-150
Styrene	50.00	0.0000	46.00	92	75-125
1,1,2,2-Tetrachloroetha	50.00	0.0000	52.72	105	55-130
Tetrachloroethene	55.00	0.0000	40.55	74	65-140
Toluene	50.00	0.0000	44.81	90	70-125
1,2,3-Trichlorobenzene	50.00	0.0000	48.77	98	60-135
1,2,4-Trichlorobenzene	50.00	0.0000	47.28	94	65-130
1,1,1-Trichloroethane	50.00	0.0000	44.11	88	70-135
1,1,2-Trichloroethane	50.00	0.0000	49.31	99	60-125
Trichloroethene	50.00	0.0000	38.65	77	75-125
Trichlorotrifluoroethan	50.00	0.0000	44.23	88	60-140
Trichlorofluoromethane	50.00	0.0000	46.14	92	25-185
Vinyl chloride	50.00	0.0000	53.74	107	60-125
Xylene(total)	150.0	0.0000	131.2	87	70-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 1 out of 51 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	70.94	71	40-140
Benzene	50.00	0.0000	46.84	94	80-120
Bromochloromethane	50.00	0.0000	48.78	98	65-130
Bromodichloromethane	50.00	0.0000	45.61	91	75-120
Bromoform	50.00	0.0000	50.93	102	70-130
Bromomethane	50.00	0.0000	35.33	71	30-145
2-Butanone	100.0	0.0000	126.2	126	30-150
Carbon disulfide	50.00	0.0000	49.37	99	35-160
Carbon tetrachloride	50.00	0.0000	48.40	97	65-140
Chlorobenzene	50.00	0.0000	51.48	103	80-120
Chloroethane	50.00	0.0000	47.46	95	60-135
Chloroform	50.00	0.0000	42.46	85	65-135
Chloromethane	50.00	0.0000	51.72	103	40-125
Cyclohexane	50.00	0.0000	45.52	91	60-130
Dibromochloromethane	50.00	0.0000	53.95	108	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	48.84	98	50-130
1,2-Dibromoethane	50.00	0.0000	48.52	97	80-120
1,2-Dichlorobenzene	50.00	0.0000	49.40	99	70-120
1,3-Dichlorobenzene	50.00	0.0000	51.46	103	75-125
1,4-Dichlorobenzene	50.00	0.0000	50.20	100	75-125
Dichlorodifluoromethane	50.00	0.0000	65.15	130	30-155
1,1-Dichloroethane	50.00	0.0000	42.19	84	70-135
1,2-Dichloroethane	50.00	0.0000	43.48	87	70-130
1,1-Dichloroethene	50.00	0.0000	46.49	93	70-130
cis-1,2-Dichloroethene	50.00	0.0000	46.41	93	70-125
trans-1,2-Dichloroethen	50.00	0.0000	47.18	94	60-140
1,2-Dichloropropane	50.00	0.0000	44.55	89	75-125
cis-1,3-Dichloropropene	50.00	0.0000	45.75	92	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

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FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	50.83	102	55-140
1,4-Dioxane	1000	0.0000	854.8	85	50-150
Ethylbenzene	50.00	0.0000	50.13	100	75-125
2-Hexanone	100.0	0.0000	82.07	82	55-130
Isopropylbenzene	50.00	0.0000	57.28	114	75-125
Methyl acetate	50.00	0.0000	48.23	96	55-150
Methyl cyclohexane	50.00	0.0000	47.02	94	60-125
Methylene chloride	50.00	0.6711	45.81	90	55-140
4-Methyl-2-pentanone	100.0	0.0000	82.76	83	60-135
Methyl-tert-butyl ether	50.00	0.0000	43.35	87	65-125
Styrene	50.00	0.0000	55.62	111	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	44.02	88	65-130
Tetrachloroethene	55.00	0.0000	57.53	105	45-150
Toluene	50.00	0.0000	50.46	101	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	47.62	95	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	47.66	95	65-135
1,1,1-Trichloroethane	50.00	0.0000	44.93	90	65-130
1,1,2-Trichloroethane	50.00	0.0000	48.16	96	75-125
Trichloroethene	50.00	0.0000	46.50	93	70-125
Trichlorotrifluoroethan	50.00	0.0000	51.08	102	60-130
Trichlorofluoromethane	50.00	0.0000	49.66	99	60-145
Vinyl chloride	50.00	0.0000	47.90	96	50-145
Xylene(total)	150.0	0.0000	150.7	100	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acetone	100.0	81.13	81	13	30	40-140
Benzene	50.00	44.38	89	5	30	80-120
Bromochloromethane	50.00	43.34	87	12	30	65-130
Bromodichloromethane	50.00	50.77	102	11	30	75-120
Bromoform	50.00	47.17	94	8	30	70-130
Bromomethane	50.00	27.30	55	26	30	30-145
2-Butanone	100.0	144.1	144	13	30	30-150
Carbon disulfide	50.00	46.90	94	5	30	35-160
Carbon tetrachloride	50.00	49.57	99	2	30	65-140
Chlorobenzene	50.00	44.93	90	14	30	80-120
Chloroethane	50.00	45.64	91	4	30	60-135
Chloroform	50.00	47.40	95	11	30	65-135
Chloromethane	50.00	67.15	134*	26	30	40-125
Cyclohexane	50.00	46.54	93	2	30	60-130
Dibromochloromethane	50.00	47.73	95	12	30	60-135
1,2-Dibromo-3-chloropro	50.00	50.64	101	4	30	50-130
1,2-Dibromoethane	50.00	45.76	92	6	30	80-120
1,2-Dichlorobenzene	50.00	47.73	95	3	30	70-120
1,3-Dichlorobenzene	50.00	48.80	98	5	30	75-125
1,4-Dichlorobenzene	50.00	48.65	97	3	30	75-125
Dichlorodifluoromethane	50.00	71.45	143	9	30	30-155
1,1-Dichloroethane	50.00	43.36	87	3	30	70-135
1,2-Dichloroethane	50.00	51.12	102	16	30	70-130
1,1-Dichloroethene	50.00	42.56	85	9	30	70-130
cis-1,2-Dichloroethene	50.00	43.70	87	6	30	70-125
trans-1,2-Dichloroethen	50.00	42.78	86	10	30	60-140
1,2-Dichloropropane	50.00	46.89	94	5	30	75-125
cis-1,3-Dichloropropene	50.00	45.98	92	0	30	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
trans-1,3-Dichloroprope	50.00	50.25	100	1	30	55-140
1,4-Dioxane	1000	843.1	84	1	30	50-150
Ethylbenzene	50.00	49.60	99	1	30	75-125
2-Hexanone	100.0	95.40	95	15	30	55-130
Isopropylbenzene	50.00	53.75	108	6	30	75-125
Methyl acetate	50.00	60.72	121	23	30	55-150
Methyl cyclohexane	50.00	45.31	91	4	30	60-125
Methylene chloride	50.00	45.49	90	1	30	55-140
4-Methyl-2-pentanone	100.0	108.6	109	27	30	60-135
Methyl-tert-butyl ether	50.00	43.27	86	0	30	65-125
Styrene	50.00	50.71	101	9	30	65-135
1,1,2,2-Tetrachloroetha	50.00	48.21	96	9	30	65-130
Tetrachloroethene	55.00	47.42	86	19	30	45-150
Toluene	50.00	45.36	91	11	30	75-120
1,2,3-Trichlorobenzene	50.00	48.57	97	2	30	55-140
1,2,4-Trichlorobenzene	50.00	46.95	94	2	30	65-135
1,1,1-Trichloroethane	50.00	49.11	98	9	30	65-130
1,1,2-Trichloroethane	50.00	47.13	94	2	30	75-125
Trichloroethene	50.00	47.60	95	2	30	70-125
Trichlorotrifluoroethan	50.00	47.52	95	7	30	60-130
Trichlorofluoromethane	50.00	53.46	107	7	30	60-145
Vinyl chloride	50.00	53.22	106	10	30	50-145
Xylene(total)	150.0	150.1	100	0	30	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 51 outside limits
Spike Recovery: 1 out of 102 outside limits

COMMENTS: _____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V5BLK0520 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	79.08	79	20-160
Benzene	50.00	0.0000	54.21	108	75-125
Bromochloromethane	50.00	0.0000	51.82	104	70-125
Bromodichloromethane	50.00	0.0000	54.38	109	70-130
Bromoform	50.00	0.0000	47.55	95	55-135
Bromomethane	50.00	0.0000	56.10	112	30-160
2-Butanone	100.0	0.0000	167.9	168*	30-160
Carbon disulfide	50.00	0.0000	58.09	116	45-160
Carbon tetrachloride	50.00	0.0000	52.95	106	65-135
Chlorobenzene	50.00	0.0000	52.07	104	75-125
Chloroethane	50.00	0.0000	55.68	111	40-155
Chloroform	50.00	0.0000	50.70	101	70-125
Chloromethane	50.00	0.5053	56.01	111	50-130
Cyclohexane	50.00	0.0000	55.40	111	65-140
Dibromochloromethane	50.00	0.0000	53.20	106	65-130
1,2-Dibromo-3-chloropro	50.00	0.0000	44.77	90	40-135
1,2-Dibromoethane	50.00	0.0000	48.38	97	70-125
1,2-Dichlorobenzene	50.00	0.0000	52.10	104	75-120
1,3-Dichlorobenzene	50.00	0.0000	48.55	97	70-125
1,4-Dichlorobenzene	50.00	0.0000	50.98	102	70-125
Dichlorodifluoromethane	50.00	0.0000	58.40	117	35-135
1,1-Dichloroethane	50.00	0.0000	54.63	109	75-125
1,2-Dichloroethane	50.00	0.0000	50.99	102	70-125
1,1-Dichloroethene	50.00	0.0000	55.77	112	65-135
cis-1,2-Dichloroethene	50.00	0.0000	52.46	105	65-125
trans-1,2-Dichloroethen	50.00	0.0000	53.53	107	65-135
1,2-Dichloropropane	50.00	0.0000	54.05	108	70-120
cis-1,3-Dichloropropene	50.00	0.0000	51.56	103	70-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V5BLK0520 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	56.45	113	65-125
1,4-Dioxane	1000	0.0000	903.0	90	50-150
Ethylbenzene	50.00	0.0000	58.61	117	75-125
2-Hexanone	100.0	0.0000	93.06	93	45-145
Isopropylbenzene	50.00	0.0000	62.48	125	75-130
Methyl acetate	50.00	0.0000	47.01	94	45-265
Methyl cyclohexane	50.00	0.0000	55.62	111	65-135
Methylene chloride	50.00	4.964	55.17	100	55-140
4-Methyl-2-pentanone	100.0	0.0000	97.77	98	45-145
Methyl-tert-butyl ether	50.00	0.0000	49.72	99	55-150
Styrene	50.00	0.0000	58.60	117	75-125
1,1,2,2-Tetrachloroetha	50.00	0.0000	47.82	96	55-130
Tetrachloroethene	55.00	0.0000	59.20	108	65-140
Toluene	50.00	0.4201	53.26	106	70-125
1,2,3-Trichlorobenzene	50.00	0.0000	52.66	105	60-135
1,2,4-Trichlorobenzene	50.00	0.0000	49.02	98	65-130
1,1,1-Trichloroethane	50.00	0.0000	51.90	104	70-135
1,1,2-Trichloroethane	50.00	0.0000	49.91	100	60-125
Trichloroethene	50.00	0.0000	57.09	114	75-125
Trichlorotrifluoroethan	50.00	0.0000	55.01	110	60-140
Trichlorofluoromethane	50.00	0.0000	55.00	110	25-185
Vinyl chloride	50.00	0.0000	50.20	100	60-125
Xylene(total)	150.0	0.0000	162.8	108	70-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 1 out of 51 outside limits

COMMENTS: _____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V5BLK0520E Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	98.54	98	20-160
Benzene	50.00	0.0000	57.03	114	75-125
Bromochloromethane	50.00	0.0000	56.68	113	70-125
Bromodichloromethane	50.00	0.0000	55.81	112	70-130
Bromoform	50.00	0.0000	52.10	104	55-135
Bromomethane	50.00	0.0000	57.38	115	30-160
2-Butanone	100.0	0.0000	186.6	187*	30-160
Carbon disulfide	50.00	0.0000	58.61	117	45-160
Carbon tetrachloride	50.00	0.0000	53.59	107	65-135
Chlorobenzene	50.00	0.0000	53.70	107	75-125
Chloroethane	50.00	0.0000	55.09	110	40-155
Chloroform	50.00	0.0000	52.97	106	70-125
Chloromethane	50.00	0.3965	54.74	109	50-130
Cyclohexane	50.00	0.0000	55.00	110	65-140
Dibromochloromethane	50.00	0.0000	54.76	110	65-130
1,2-Dibromo-3-chloropro	50.00	0.0000	54.27	108	40-135
1,2-Dibromoethane	50.00	0.0000	53.82	108	70-125
1,2-Dichlorobenzene	50.00	0.0000	53.74	107	75-120
1,3-Dichlorobenzene	50.00	0.0000	51.41	103	70-125
1,4-Dichlorobenzene	50.00	0.0000	52.25	104	70-125
Dichlorodifluoromethane	50.00	0.0000	55.37	111	35-135
1,1-Dichloroethane	50.00	0.0000	54.26	108	75-125
1,2-Dichloroethane	50.00	0.0000	53.18	106	70-125
1,1-Dichloroethene	50.00	0.0000	55.41	111	65-135
cis-1,2-Dichloroethene	50.00	0.0000	52.89	106	65-125
trans-1,2-Dichloroethen	50.00	0.0000	52.76	106	65-135
1,2-Dichloropropane	50.00	0.0000	54.92	110	70-120
cis-1,3-Dichloropropene	50.00	0.0000	52.20	104	70-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: V5BLK0520E Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	53.54	107	65-125
1,4-Dioxane	1000	0.0000	1150	115	50-150
Ethylbenzene	50.00	0.0000	59.33	119	75-125
2-Hexanone	100.0	0.0000	99.64	100	45-145
Isopropylbenzene	50.00	0.0000	58.63	117	75-130
Methyl acetate	50.00	0.0000	54.52	109	45-265
Methyl cyclohexane	50.00	0.0000	58.51	117	65-135
Methylene chloride	50.00	11.35	62.60	102	55-140
4-Methyl-2-pentanone	100.0	0.0000	114.9	115	45-145
Methyl-tert-butyl ether	50.00	0.0000	51.21	102	55-150
Styrene	50.00	0.0000	60.00	120	75-125
1,1,2,2-Tetrachloroetha	50.00	0.0000	52.05	104	55-130
Tetrachloroethene	55.00	0.0000	66.70	121	65-140
Toluene	50.00	0.0000	56.09	112	70-125
1,2,3-Trichlorobenzene	50.00	0.0000	55.12	110	60-135
1,2,4-Trichlorobenzene	50.00	0.0000	54.42	109	65-130
1,1,1-Trichloroethane	50.00	0.0000	53.11	106	70-135
1,1,2-Trichloroethane	50.00	0.0000	51.23	102	60-125
Trichloroethene	50.00	0.0000	57.70	115	75-125
Trichlorotrifluoroethan	50.00	0.0000	55.99	112	60-140
Trichlorofluoromethane	50.00	0.0000	53.39	107	25-185
Vinyl chloride	50.00	0.0000	48.08	96	60-125
Xylene(total)	150.0	0.0000	170.6	114	70-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 1 out of 51 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V4BLK0508

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V4BLK01 Lab Sample ID: V4BLK0508

Date Analyzed: 05/08/08 Time Analyzed: 0949

Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA4

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V4BLK0508LCS	V4BLK0508LCS	V4LCSAP9	0823
02	TB-1(0506200	0805055-07	0505507	1049
03	TB2(05072008	0805074-13	0507413	1119
04	5DITCHP002(0	0805055-02	0505502	1218
05	5DITCHP001(0	0805055-04	0505504	1247
06	5DITCHHP003(	0805074-01	0507401	1514
07	5DITCHHP004(	0805074-02	0507402	1543
08	5DUP001(0506	0805074-03	0507403	1613
09	V4BLK0508LCS	V4BLK0508LCSD	V4LCDAP9	1712
10				
11				
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0508

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0508

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 05/08/08 09:49

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.53	J
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0508

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0508

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 05/08/08 09:49

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V1BLK0509

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V1BLK01 Lab Sample ID: V1BLK0509

Date Analyzed: 05/09/08 Time Analyzed: 1555

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

Instrument ID: VOA1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V1BLK0509LCS	V1BLK0509LCS	V1LCSAP9	1444
02	1549SB003(0.	0805074-04	0507404A	1817
03	1549SB001(0.	0805074-05	0507405A	1852
04	1549DUP002(0	0805074-07	0507407A	1928
05	1549SB004(0.	0805074-08	0507408A	2003
06	1549SB006(0.	0805074-10	0507410A	2038
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0509

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0509

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/09/08 15:55

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.0	10		U
71-43-2	Benzene	0.47	5.0		U
74-97-5	Bromochloromethane	0.42	5.0		U
75-27-4	Bromodichloromethane	0.30	5.0		U
75-25-2	Bromoform	1.0	5.0		U
74-83-9	Bromomethane	0.72	5.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	1.3	5.0		U
56-23-5	Carbon tetrachloride	0.88	5.0		U
108-90-7	Chlorobenzene	0.34	5.0		U
75-00-3	Chloroethane	1.1	5.0		U
67-66-3	Chloroform	0.55	5.0		U
74-87-3	Chloromethane	0.52	5.0		U
110-82-7	Cyclohexane	0.54	5.0		U
124-48-1	Dibromochloromethane	0.34	5.0		U
96-12-8	1,2-Dibromo-3-chloropropane	1.2	5.0		U
106-93-4	1,2-Dibromoethane	0.43	5.0		U
95-50-1	1,2-Dichlorobenzene	0.37	5.0		U
541-73-1	1,3-Dichlorobenzene	0.84	5.0		U
106-46-7	1,4-Dichlorobenzene	0.55	5.0		U
75-71-8	Dichlorodifluoromethane	1.1	5.0		U
75-34-3	1,1-Dichloroethane	0.54	5.0		U
107-06-2	1,2-Dichloroethane	0.46	5.0		U
75-35-4	1,1-Dichloroethene	1.2	5.0		U
156-59-2	cis-1,2-Dichloroethene	1.2	5.0		U
156-60-5	trans-1,2-Dichloroethene	1.1	5.0		U
78-87-5	1,2-Dichloropropane	0.46	5.0		U
10061-01-5	cis-1,3-Dichloropropene	0.50	5.0		U
10061-02-6	trans-1,3-Dichloropropene	0.32	5.0		U
123-91-1	1,4-Dioxane	0.50	50		U
100-41-4	Ethylbenzene	0.75	5.0		U
591-78-6	2-Hexanone	2.3	10		U
98-82-8	Isopropylbenzene	0.88	5.0		U
79-20-9	Methyl acetate	1.6	5.0		U
108-87-2	Methyl cyclohexane	0.30	5.0		U
75-09-2	Methylene chloride	0.62	5.0	2.7	J
108-10-1	4-Methyl-2-pentanone	0.58	10		U
1634-04-4	Methyl-tert-butyl ether	0.32	5.0		U
100-42-5	Styrene	0.35	5.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0509

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0509

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/09/08 15:55

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.43	5.0		U
127-18-4	Tetrachloroethene	0.97	5.0		U
108-88-3	Toluene	0.86	5.0		U
87-61-6	1,2,3-Trichlorobenzene	0.42	5.0		U
120-82-1	1,2,4-Trichlorobenzene	0.18	5.0		U
71-55-6	1,1,1-Trichloroethane	0.90	5.0		U
79-00-5	1,1,2-Trichloroethane	0.35	5.0		U
79-01-6	Trichloroethene	0.85	5.0		U
76-13-1	Trichlorotrifluoroethane	0.55	5.0		U
75-69-4	Trichlorofluoromethane	0.95	5.0		U
75-01-4	Vinyl chloride	1.1	5.0		U
1330-20-7	Xylene(total)	0.70	5.0		U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V4BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V4BLK01 Lab Sample ID: V4BLK0514

Date Analyzed: 05/14/08 Time Analyzed: 0919

Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA4

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V4BLK0514LCS	V4BLK0514LCS	V4LCS01	0752
02	TB3 (0506200	0805095-06	0509506	1018
03	1041HP002 (0	0805095-05	0509505	1314
04	V4BLK0514LCS	V4BLK0514LCSD	V4LCSD01	1809
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0514

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 05/14/08 09:19

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.67	J
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0514

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 05/14/08 09:19

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V5BLK0520

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V5BLK01 Lab Sample ID: V5BLK0520

Date Analyzed: 05/20/08 Time Analyzed: 0932

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

Instrument ID: VOA5

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V5BLK0520LCS	V5BLK0520LCS	V5LCSMIX	0830
02	5DITCHSB003(	0805055-05	0505505A	1034
03	5DITCHSB004(	0805055-06	0505506A	1105
04	1034SB004 (0	0805095-01	0509501B	1136
05	10341SB002 (	0805095-03	0509503B	1207
06	1041SB004 (0	0805095-07	0509507B	1238
07	1034SB001 (0	0805095-09	0509509B	1309
08	1034SB008 (0	0805095-11	0509511B	1340
09	1034SB004 (5	0805095-02	0509502A	1411
10	1041SB002 (7	0805095-04	0509504A	1442
11	1041SB004 (7	0805095-08	0509508A	1513
12	1034SB001 (7	0805095-10	0509510A	1544
13	1034SB008 (4	0805095-12	0509512A	1615
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V5BLK0520

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: V5BLK0520

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V5BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/20/08 09:32

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.6	10		U
71-43-2	Benzene	0.19	5.0		U
74-97-5	Bromochloromethane	0.35	5.0		U
75-27-4	Bromodichloromethane	0.22	5.0		U
75-25-2	Bromoform	0.59	5.0		U
74-83-9	Bromomethane	0.41	5.0		U
78-93-3	2-Butanone	2.0	10		U
75-15-0	Carbon disulfide	0.27	5.0		U
56-23-5	Carbon tetrachloride	0.24	5.0		U
108-90-7	Chlorobenzene	0.33	5.0		U
75-00-3	Chloroethane	0.40	5.0		U
67-66-3	Chloroform	0.43	5.0		U
74-87-3	Chloromethane	0.36	5.0	0.50	J
110-82-7	Cyclohexane	0.42	5.0		U
124-48-1	Dibromochloromethane	0.24	5.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.68	5.0		U
106-93-4	1,2-Dibromoethane	0.56	5.0		U
95-50-1	1,2-Dichlorobenzene	0.23	5.0		U
541-73-1	1,3-Dichlorobenzene	0.23	5.0		U
106-46-7	1,4-Dichlorobenzene	0.18	5.0		U
75-71-8	Dichlorodifluoromethane	0.30	5.0		U
75-34-3	1,1-Dichloroethane	0.41	5.0		U
107-06-2	1,2-Dichloroethane	0.43	5.0		U
75-35-4	1,1-Dichloroethene	0.32	5.0		U
156-59-2	cis-1,2-Dichloroethene	0.27	5.0		U
156-60-5	trans-1,2-Dichloroethene	0.55	5.0		U
78-87-5	1,2-Dichloropropane	0.57	5.0		U
10061-01-5	cis-1,3-Dichloropropene	0.35	5.0		U
10061-02-6	trans-1,3-Dichloropropene	0.37	5.0		U
123-91-1	1,4-Dioxane	0.50	50		U
100-41-4	Ethylbenzene	0.24	5.0		U
591-78-6	2-Hexanone	0.61	10		U
98-82-8	Isopropylbenzene	0.26	5.0		U
79-20-9	Methyl acetate	0.57	5.0		U
108-87-2	Methyl cyclohexane	0.39	5.0		U
75-09-2	Methylene chloride	1.1	5.0	5.0	J
108-10-1	4-Methyl-2-pentanone	0.60	10		U
1634-04-4	Methyl-tert-butyl ether	0.57	5.0		U
100-42-5	Styrene	0.34	5.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V5BLK0520

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: V5BLK0520

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V5BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/20/08 09:32

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.32	5.0		U
127-18-4	Tetrachloroethene	0.21	5.0		U
108-88-3	Toluene	0.38	5.0	0.42	J
87-61-6	1,2,3-Trichlorobenzene	0.19	5.0		U
120-82-1	1,2,4-Trichlorobenzene	0.31	5.0		U
71-55-6	1,1,1-Trichloroethane	0.34	5.0		U
79-00-5	1,1,2-Trichloroethane	0.49	5.0		U
79-01-6	Trichloroethene	0.41	5.0		U
76-13-1	Trichlorotrifluoroethane	0.36	5.0		U
75-69-4	Trichlorofluoromethane	0.41	5.0		U
75-01-4	Vinyl chloride	0.47	5.0		U
1330-20-7	Xylene(total)	0.21	5.0		U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V5BLK0520E

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V5BLK01E Lab Sample ID: V5BLK0520E

Date Analyzed: 05/20/08 Time Analyzed: 1921

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

Instrument ID: VOA5

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V5BLK0520ELC	V5BLK0520ELCS	V5LCSIXE	1819
02	1549SB001(7-	0805074-06	0507406A	1952
03	1549SB004(5-	0805074-09	0507409A	2023
04	1549SB006(5-	0805074-11	0507411A	2054
05	1549SB003(5-	0805074-12	0507412A	2125
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V5BLK0520E

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: V5BLK0520E

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V5BLK01E

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/20/08 19:21

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.6	10		U
71-43-2	Benzene	0.19	5.0		U
74-97-5	Bromochloromethane	0.35	5.0		U
75-27-4	Bromodichloromethane	0.22	5.0		U
75-25-2	Bromoform	0.59	5.0		U
74-83-9	Bromomethane	0.41	5.0		U
78-93-3	2-Butanone	2.0	10		U
75-15-0	Carbon disulfide	0.27	5.0		U
56-23-5	Carbon tetrachloride	0.24	5.0		U
108-90-7	Chlorobenzene	0.33	5.0		U
75-00-3	Chloroethane	0.40	5.0		U
67-66-3	Chloroform	0.43	5.0		U
74-87-3	Chloromethane	0.36	5.0	0.40	J
110-82-7	Cyclohexane	0.42	5.0		U
124-48-1	Dibromochloromethane	0.24	5.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.68	5.0		U
106-93-4	1,2-Dibromoethane	0.56	5.0		U
95-50-1	1,2-Dichlorobenzene	0.23	5.0		U
541-73-1	1,3-Dichlorobenzene	0.23	5.0		U
106-46-7	1,4-Dichlorobenzene	0.18	5.0		U
75-71-8	Dichlorodifluoromethane	0.30	5.0		U
75-34-3	1,1-Dichloroethane	0.41	5.0		U
107-06-2	1,2-Dichloroethane	0.43	5.0		U
75-35-4	1,1-Dichloroethene	0.32	5.0		U
156-59-2	cis-1,2-Dichloroethene	0.27	5.0		U
156-60-5	trans-1,2-Dichloroethene	0.55	5.0		U
78-87-5	1,2-Dichloropropane	0.57	5.0		U
10061-01-5	cis-1,3-Dichloropropene	0.35	5.0		U
10061-02-6	trans-1,3-Dichloropropene	0.37	5.0		U
123-91-1	1,4-Dioxane	0.50	50		U
100-41-4	Ethylbenzene	0.24	5.0		U
591-78-6	2-Hexanone	0.61	10		U
98-82-8	Isopropylbenzene	0.26	5.0		U
79-20-9	Methyl acetate	0.57	5.0		U
108-87-2	Methyl cyclohexane	0.39	5.0		U
75-09-2	Methylene chloride	1.1	5.0	11	
108-10-1	4-Methyl-2-pentanone	0.60	10		U
1634-04-4	Methyl-tert-butyl ether	0.57	5.0		U
100-42-5	Styrene	0.34	5.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V5BLK0520E

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: V5BLK0520E

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V5BLK01E

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/20/08 19:21

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.32	5.0		U
127-18-4	Tetrachloroethene	0.21	5.0		U
108-88-3	Toluene	0.38	5.0		U
87-61-6	1,2,3-Trichlorobenzene	0.19	5.0		U
120-82-1	1,2,4-Trichlorobenzene	0.31	5.0		U
71-55-6	1,1,1-Trichloroethane	0.34	5.0		U
79-00-5	1,1,2-Trichloroethane	0.49	5.0		U
79-01-6	Trichloroethene	0.41	5.0		U
76-13-1	Trichlorotrifluoroethane	0.36	5.0		U
75-69-4	Trichlorofluoromethane	0.41	5.0		U
75-01-4	Vinyl chloride	0.47	5.0		U
1330-20-7	Xylene(total)	0.21	5.0		U

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA88279

Lab File ID: V1BFB01 BFB Injection Date: 02/15/08

Instrument ID: VOA1 BFB Injection Time: 0954

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.6
75	30.0 - 60.0% of mass 95	49.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	73.6
175	5.0 - 9.0% of mass 174	5.5 (7.5)1
176	95.0 - 101.0% of mass 174	71.0 (96.5)1
177	5.0 - 9.0% of mass 176	5.1 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1AP9CAL	V1AP9CAL	V1ASTD7	02/15/08	1530
02	V1AP9CAL	V1AP9CAL	V1ASTD6	02/15/08	1605
03	V1AP9CAL	V1AP9CAL	V1ASTD5	02/15/08	1640
04	V1BLK0215LCS	V1BLK0215LCS	V1ICVAP9	02/15/08	1715
05	V1AP9CAL	V1AP9CAL	V1ASTD4	02/15/08	1750
06	V1AP9CAL	V1AP9CAL	V1ASTD3	02/15/08	1825
07	V1AP9CAL	V1AP9CAL	V1ASTD2	02/15/08	1900
08	V1AP9CAL	V1AP9CAL	V1ASTD1	02/15/08	1935
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: CITY

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA25189

Lab File ID: V4BFB01 BFB Injection Date: 04/02/08

Instrument ID: VOA4 BFB Injection Time: 1352

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.3
75	30.0 - 60.0% of mass 95	41.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	82.0
175	5.0 - 9.0% of mass 174	6.1 (7.4)1
176	95.0 - 101.0% of mass 174	78.2 (95.4)1
177	5.0 - 9.0% of mass 176	5.3 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		V4CALIB	V4ASTD09	04/02/08	1649
02		V4CALIB	V4ASTD08	04/02/08	1718
03		V4CALIB	V4ASTD07	04/02/08	1748
04		V4CALIB	V4ASTD06	04/02/08	1847
05		V4CALIB	V4ASTD05	04/02/08	1916
06		V4CALIB	V4ASTD04	04/02/08	1946
07		V4CALIB	V4ASTD03	04/02/08	2015
08		V4CALIB	V4ASTD02	04/02/08	2044
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA25189

Lab File ID: V4BFB01 BFB Injection Date: 04/09/08

Instrument ID: VOA4 BFB Injection Time: 1359

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	23.9
75	30.0 - 60.0% of mass 95	44.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	58.1
175	5.0 - 9.0% of mass 174	4.1 (7.0)1
176	95.0 - 101.0% of mass 174	58.1 (100.0)1
177	5.0 - 9.0% of mass 176	3.7 (6.3)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD200PPB	V4STD200PPB	V4STD09	04/09/08	1458
02	V4STD100PPB	V4STD100PPB	V4STD08	04/09/08	1528
03	V4STD50PPB	V4STD50PPB	V4STD07	04/09/08	1557
04	V4BLK0409LCS	V4BLK0409LCS	V4ICV01	04/09/08	1627
05	V4STD20PPB	V4STD20PPB	V4STD06	04/09/08	1656
06	V4STD10PPB	V4STD10PPB	V4STD05	04/09/08	1726
07	V4STD2PPB	V4STD2PPB	V4STD04	04/09/08	1755
08	V4STD1PPB	V4STD1PPB	V4STD03	04/09/08	1824
09	V4STD0.5PPB	V4STD0.5PPB	V4STD02	04/09/08	1854
10	V4STD0.25PPB	V4STD0.25PPB	V4STD01	04/09/08	1924
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA87791

Lab File ID: V1BFB01 BFB Injection Date: 05/01/08

Instrument ID: VOA1 BFB Injection Time: 1016

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.0
75	30.0 - 60.0% of mass 95	46.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	76.3
175	5.0 - 9.0% of mass 174	5.8 (7.6)1
176	95.0 - 101.0% of mass 174	76.8 (100.8)1
177	5.0 - 9.0% of mass 176	5.2 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1STD200PPB	V1STD200PPB	V1STD07	05/01/08	1138
02		V1STD100PPB	V1STD06	05/01/08	1213
03		V1STD50PPB	V1STD05	05/01/08	1249
04		V1STD20PPB	V1STD04	05/01/08	1324
05		V1STD10PPB	V1STD03	05/01/08	1359
06		V1STD5PPB	V1STD02	05/01/08	1435
07		V1STD2PPB	V1STD01	05/01/08	1510
08	V1BLK0501LCS	V1BLK0501LCS	V1ICV01	05/01/08	1545
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V4BFB01 BFB Injection Date: 05/08/08

Instrument ID: VOA4 BFB Injection Time: 0654

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.1
75	30.0 - 60.0% of mass 95	42.1
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	70.1
175	5.0 - 9.0% of mass 174	5.1 (7.3)1
176	95.0 - 101.0% of mass 174	69.1 (98.7)1
177	5.0 - 9.0% of mass 176	5.0 (7.3)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STDAP9	V4STDAP9	V4CCVAP9	05/08/08	0724
02	V4STD50PPB	V4STD50PPB	V4CCV01	05/08/08	0753
03	V4BLK0508LCS	V4BLK0508LCS	V4LCSAP9	05/08/08	0823
04	V4BLK0508	V4BLK0508	V4BLK01	05/08/08	0949
05	TB-1(0506200	0805055-07	0505507	05/08/08	1049
06	TB2(05072008	0805074-13	0507413	05/08/08	1119
07	5DITCHP002(0	0805055-02	0505502	05/08/08	1218
08	5DITCHP001(0	0805055-04	0505504	05/08/08	1247
09	5DITCHHP003(	0805074-01	0507401	05/08/08	1514
10	5DITCHHP004(	0805074-02	0507402	05/08/08	1543
11	5DUP001(0506	0805074-03	0507403	05/08/08	1613
12	V4BLK0508LCS	V4BLK0508LCSD	V4LCDAP9	05/08/08	1712
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V1BFB01 BFB Injection Date: 05/09/08

Instrument ID: VOA1 BFB Injection Time: 1247

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.6
75	30.0 - 60.0% of mass 95	48.1
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	82.0
175	5.0 - 9.0% of mass 174	5.8 (7.0)1
176	95.0 - 101.0% of mass 174	80.1 (97.6)1
177	5.0 - 9.0% of mass 176	6.0 (7.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1STD50PPB	V1STD50PPB	V1CCV01	05/09/08	1319
02	V1STD50PPB	V1STD50PPB	V1CCVAP9	05/09/08	1409
03	V1BLK0509LCS	V1BLK0509LCS	V1LCSAP9	05/09/08	1444
04	V1BLK0509	V1BLK0509	V1BLK01	05/09/08	1555
05	1549SB003(0.	0805074-04	0507404A	05/09/08	1817
06	1549SB001(0.	0805074-05	0507405A	05/09/08	1852
07	1549DUP002(0	0805074-07	0507407A	05/09/08	1928
08	1549SB004(0.	0805074-08	0507408A	05/09/08	2003
09	1549SB006(0.	0805074-10	0507410A	05/09/08	2038
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V4BFB01 BFB Injection Date: 05/14/08

Instrument ID: VOA4 BFB Injection Time: 0624

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.2
75	30.0 - 60.0% of mass 95	38.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	67.8
175	5.0 - 9.0% of mass 174	4.6 (6.8)1
176	95.0 - 101.0% of mass 174	66.0 (97.5)1
177	5.0 - 9.0% of mass 176	4.7 (7.2)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD50PPB	V4STD50PPB	V4CCVA9	05/14/08	0653
02	V4STD50PPB	V4STD50PPB	V4CCV01	05/14/08	0723
03	V4BLK0514LCS	V4BLK0514LCS	V4LCS01	05/14/08	0752
04	V4BLK0514	V4BLK0514	V4BLK01	05/14/08	0919
05	TB3 (0506200	0805095-06	0509506	05/14/08	1018
06	1041HP002 (0	0805095-05	0509505	05/14/08	1314
07	V4BLK0514LCS	V4BLK0514LCSD	V4LCSD01	05/14/08	1809
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA94575

Lab File ID: V5BFB01 BFB Injection Date: 05/19/08

Instrument ID: VOA5 BFB Injection Time: 1030

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.1
75	30.0 - 60.0% of mass 95	44.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	75.9
175	5.0 - 9.0% of mass 174	5.7 (7.5)1
176	95.0 - 101.0% of mass 174	74.0 (97.5)1
177	5.0 - 9.0% of mass 176	4.9 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V5STD200PPB	V5STD200PPB	V5CALS07	05/19/08	1132
02	V5STD100PPB	V5STD100PPB	V5CALS06	05/19/08	1204
03	V5STD50PPB	V5STD50PPB	V5CALS05	05/19/08	1235
04	V5STD20PPB	V5STD20PPB	V5CALS04	05/19/08	1306
05	V5STD10PPB	V5STD10PPB	V5CALS03	05/19/08	1337
06	V5STD5PPB	V5STD5PPB	V5CALS02	05/19/08	1408
07	V5STD2PPB	V5STD2PPB	V5CALS01	05/19/08	1439
08	V5BLK0519LCS	V5BLK0519LCS	V5SLCS01	05/19/08	1509
09	V5AP9CAL	V5AP9CAL	V5AP9CA7	05/19/08	1541
10	V5AP9CAL	V5AP9CAL	V5AP9CA6	05/19/08	1612
11	V5AP9CAL	V5AP9CAL	V5AP9CA5	05/19/08	1643
12	V5AP9CAL	V5AP9CAL	V5AP9CA4	05/19/08	1714
13	V5AP9CAL	V5AP9CAL	V5AP9CA3	05/19/08	1745
14	V5AP9CAL	V5AP9CAL	V5AP9CA2	05/19/08	1816
15	V5AP9CAL	V5AP9CAL	V5AP9CA1	05/19/08	1846
16	V5BLK0519LCS	V5BLK0519LCS	V5SAP9LC	05/19/08	1917
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V5BFB01 BFB Injection Date: 05/20/08

Instrument ID: VOA5 BFB Injection Time: 0657

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.4
75	30.0 - 60.0% of mass 95	44.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	79.0
175	5.0 - 9.0% of mass 174	5.8 (7.4)1
176	95.0 - 101.0% of mass 174	75.3 (95.2)1
177	5.0 - 9.0% of mass 176	5.3 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V5STD50PPB	V5STD50PPB	V5CCV01	05/20/08	0728
02	V5STD50PPB	V5STD50PPB	V5CCVAP9	05/20/08	0759
03	V5BLK0520LCS	V5BLK0520LCS	V5LCSMIX	05/20/08	0830
04	V5BLK0520	V5BLK0520	V5BLK01	05/20/08	0932
05	5DITCHSB003(	0805055-05	0505505A	05/20/08	1034
06	5DITCHSB004(	0805055-06	0505506A	05/20/08	1105
07	1034SB004 (0	0805095-01	0509501B	05/20/08	1136
08	10341SB002 (	0805095-03	0509503B	05/20/08	1207
09	1041SB004 (0	0805095-07	0509507B	05/20/08	1238
10	1034SB001 (0	0805095-09	0509509B	05/20/08	1309
11	1034SB008 (0	0805095-11	0509511B	05/20/08	1340
12	1034SB004 (5	0805095-02	0509502A	05/20/08	1411
13	1041SB002 (7	0805095-04	0509504A	05/20/08	1442
14	1041SB004 (7	0805095-08	0509508A	05/20/08	1513
15	1034SB001 (7	0805095-10	0509510A	05/20/08	1544
16	1034SB008 (4	0805095-12	0509512A	05/20/08	1615
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: V5BFB01E BFB Injection Date: 05/20/08

Instrument ID: VOA5 BFB Injection Time: 1646

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.8
75	30.0 - 60.0% of mass 95	44.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.0
173	Less than 2.0% of mass 174	0.5 (0.8)1
174	Greater than 50.0% of mass 95	65.3
175	5.0 - 9.0% of mass 174	5.4 (8.3)1
176	95.0 - 101.0% of mass 174	64.0 (98.0)1
177	5.0 - 9.0% of mass 176	4.1 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V5STD50PPB	V5STD50PPB	V5CCV01E	05/20/08	1717
02	V5STD50PPB	V5STD50PPB	V5CCVA9E	05/20/08	1748
03	V5BLK0520ELC	V5BLK0520ELCS	V5LCSIXE	05/20/08	1819
04	V5BLK0520E	V5BLK0520E	V5BLK01E	05/20/08	1921
05	1549SB001(7-	0805074-06	0507406A	05/20/08	1952
06	1549SB004(5-	0805074-09	0507409A	05/20/08	2023
07	1549SB006(5-	0805074-11	0507411A	05/20/08	2054
08	1549SB003(5-	0805074-12	0507412A	05/20/08	2125
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FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): V4CCV01 Date Analyzed: 05/08/08

Instrument ID: VOA4 Time Analyzed: 0753

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	826194	13.37	334842	16.69	310925	18.66
	UPPER LIMIT	1652388	13.87	669684	17.19	621850	19.16
	LOWER LIMIT	413097	12.87	167421	16.19	155463	18.16
	CLIENT SAMPLE NO.						
01	V4BLK0508LCS	887880	13.38	356825	16.69	324121	18.66
02	V4BLK0508	788117	13.38	297657	16.69	244900	18.66
03	TB-1(0506200	738484	13.37	301465	16.70	228737	18.66
04	TB2(05072008	711689	13.37	285936	16.70	219460	18.66
05	5DITCHHP002(	687823	13.38	273910	16.70	207875	18.66
06	5DITCHHP001(	677504	13.38	266106	16.70	211468	18.66
07	5DITCHHP003(	622921	13.39	259015	16.70	195027	18.66
08	5DITCHHP004(	640656	13.38	252424	16.70	192952	18.67
09	5DUP001(0506	612381	13.38	246392	16.70	183116	18.67
10	V4BLK0508LCS	671505	13.38	293222	16.70	263513	18.66
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): V1CCV01 Date Analyzed: 05/09/08

Instrument ID: VOA1 Time Analyzed: 1319

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

		IS1(FLB) AREA	#	RT	#	IS2(CBZ) AREA	#	RT	#	IS3(DCB) AREA	#	RT	#
	12 HOUR STD	1209951		15.31		471429		20.33		365824		24.18	
	UPPER LIMIT	2419902		15.81		942858		20.83		731648		24.68	
	LOWER LIMIT	604976		14.81		235715		19.83		182912		23.68	
	CLIENT SAMPLE NO.												
01	V1BLK0509LCS	1046954		15.30		429740		20.34		322474		24.17	
02	V1BLK0509	1006968		15.31		418918		20.34		299174		24.17	
03	1549SB003(0.	962431		15.31		401670		20.34		290903		24.19	
04	1549SB001(0.	961146		15.31		401835		20.32		290398		24.17	
05	1549DUP002(0	942762		15.30		401709		20.32		291988		24.17	
06	1549SB004(0.	946943		15.29		402634		20.34		287489		24.17	
07	1549SB006(0.	947565		15.29		390989		20.32		286973		24.17	
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): V4CCV01 Date Analyzed: 05/14/08

Instrument ID: VOA4 Time Analyzed: 0723

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	1006773	13.36	392349	16.68	384420	18.64
	UPPER LIMIT	2013546	13.86	784698	17.18	768840	19.14
	LOWER LIMIT	503387	12.86	196175	16.18	192210	18.14
	CLIENT SAMPLE NO.						
01	V4BLK0514LCS	970317	13.35	390216	16.68	361506	18.65
02	V4BLK0514	885466	13.35	340552	16.68	291663	18.65
03	TB3 (0506200	794894	13.36	308450	16.68	261741	18.64
04	1041HP002 (0	714482	13.36	274198	16.68	218180	18.64
05	V4BLK0514LCS	647485	13.35	283049	16.68	247414	18.65
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): V5CCV01 Date Analyzed: 05/20/08

Instrument ID: VOA5 Time Analyzed: 0728

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

		IS1 (FLB) AREA #	RT #	IS2 (CBZ) AREA #	RT #	IS3 (DCB) AREA #	RT #
	12 HOUR STD	851930	11.71	388706	15.51	394473	17.46
	UPPER LIMIT	1703860	12.21	777412	16.01	788946	17.96
	LOWER LIMIT	425965	11.21	194353	15.01	197237	16.96
	CLIENT SAMPLE NO.						
01	V5BLK0520LCS	844474	11.70	373365	15.51	400736	17.45
02	V5BLK0520	787504	11.71	339832	15.52	331744	17.46
03	5DITCHSB003(	767757	11.71	348242	15.51	349059	17.46
04	5DITCHSB004(	778177	11.70	331323	15.51	350831	17.45
05	1034SB004 (0	772665	11.71	330501	15.52	364095	17.46
06	10341SB002 (	760250	11.70	333092	15.52	351758	17.46
07	1041SB004 (0	722592	11.70	333027	15.51	349071	17.45
08	1034SB001 (0	696465	11.70	352939	15.52	379630	17.45
09	1034SB008 (0	774115	11.70	349954	15.51	379813	17.46
10	1034SB004 (5	784588	11.70	343154	15.52	368234	17.45
11	1041SB002 (7	641554	11.70	272881	15.51	286620	17.45
12	1041SB004 (7	748873	11.71	330858	15.52	348998	17.47
13	1034SB001 (7	716548	11.71	335056	15.51	365066	17.46
14	1034SB008 (4	770579	11.70	329963	15.52	361132	17.46
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): V5CCV01E Date Analyzed: 05/20/08

Instrument ID: VOA5 Time Analyzed: 1717

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	768095	11.71	372555	15.52	385181	17.47
	UPPER LIMIT	1536190	12.21	745110	16.02	770362	17.97
	LOWER LIMIT	384048	11.21	186278	15.02	192591	16.97
	CLIENT SAMPLE NO.						
01	V5BLK0520ELC	817261	11.71	377151	15.51	394153	17.46
02	V5BLK0520E	754258	11.70	335268	15.51	351291	17.45
03	1549SB001(7-	761839	11.70	345775	15.51	374813	17.45
04	1549SB004(5-	730186	11.70	317480	15.51	355812	17.46
05	1549SB006(5-	728659	11.70	321279	15.52	351445	17.46
06	1549SB003(5-	735405	11.70	318782	15.51	356751	17.45
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

SEMI-VOLATILES SECTION

ORGANIC CASE NARRATIVE - Semivolatiles
Arcadis – Radford001

Date Sampled	Date Received	Lab ID	Client ID	TAT/SDG
05/07/08	05/08/08	0805074-04	1549SB003(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-05	1549SB001(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-06	1549SB001(7-8)	Radford003
05/07/08	05/08/08	0805074-07	1549DUP002(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-08	1549SB004(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-09	1549SB004(5-6)	Radford003
05/07/08	05/08/08	0805074-10	1549SB006(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-11	1549SB006(5-6)	Radford003
05/07/08	05/08/08	0805074-12	1549SB003(5-6)	Radford003
05/07/08	05/08/08	0805074-13	TB2(05072008-01)	X
05/08/08	05/09/08	0805095-01	1034SB004 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-02	1034SB004 (5-6)	Radford003
05/08/08	05/09/08	0805095-03	1041SB002 (1-2)	4BD
05/08/08	05/09/08	0805095-04	1041SB002 (7-8)	Radford003
05/08/08	05/09/08	0805095-05	1041HP002 (05062008)	X
05/08/08	05/09/08	0805095-07	1041SB004 (0-1)	4BD
05/08/08	05/09/08	0805095-08	1041SB004 (7-8)	Radford003
05/08/08	05/09/08	0805095-09	1034SB001 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-10	1034SB001 (7-8)	Radford003
05/08/08	05/09/08	0805095-11	1034SB008 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-12	1034SB008 (4-5)	Radford003

Method: The samples were extracted/analyzed by USEPA SW-846 Methods 3541/8270C or 3510C/8270C (automated soxhlet or separatory funnel extraction followed by capillary column GC/MS) for soils or waters upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

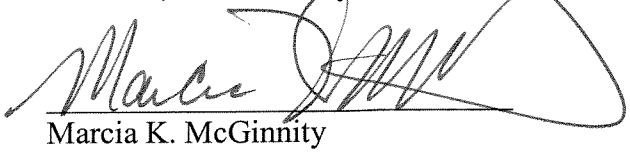
- Note: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction was requested 5/19/08 for samples reflected as SDG Radford003 but analysis is still pending request from the client. E-mail instructions are attached.
- DFTPP Tuning: All method tuning criteria were met.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded as indicated in the following clarifications:

1. BNA3 ICV analyzed with the initial calibration exceeded 20% difference for benzo(g,h,i)perylene, 4-chloro-3-methylphenol, 2,4-dimethylphenol, hexachlorocyclopentadiene, 4-nitroaniline and pyrene with positive biases at 22.6%, 23.5%, 24.9%, 25.6%, 23.9% and 23.3%, respectively. These analytes were not detected in the associated samples with the exception of benzo(g,h,i)perylene and pyrene. Reported concentrations above the quantitation limit for these analytes are qualified with an "X" on the form Is and EDD for a potential positive bias.
2. BNA3 CCV analyzed 5/12/08 at 10:06 exceeded 20% difference for atrazine, benzaldehyde, carbazole, 3,3'-dichlorobenzidine, hexachlorocyclopentadiene and indeno(1,2,3-cd)perylene with negative biases of 32.1%, 48.1%, 27.7%, 44.2%, 34.9% and 24.6%, respectively. Results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias.
3. BNA3 CCV analyzed 5/13/08 at 11:15 exceeded 20% difference for atrazine, benzaldehyde, 3,3'-dichlorobenzidine and hexachlorocyclopentadiene with negative biases of 34.1%, 46%, 38.3% and 38.4%, respectively. Results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias.

- Blank Results: No target analytes were detected in the soil method blanks. Caprolactam was detected in method blank SBLK0512BW1 but was not detected in the associated sample.
- Surrogate Recoveries: All surrogate recoveries were within limits with the exception of sample 1549DUP002 (0.5-1.5) in which 4 of 6 recoveries were below the limits of 35%, 40%, 35% and 45% at 34%, 35%, 30% and 33%, respectively.

- SBLK0512BW1LCS results: Recovery of caprolactam was below the limit of 20% at 17% while the recovery of 2,4-dinitrophenol exceeded the limit of 140% at 168%. All other recoveries were within limits.
- SBLK0512BS1LCS results: Recoveries of atrazine, benzaldehyde and 1,2,4,5-tetrachlorobenzene were below the respective limits of 55%, 10% and 50% at 54%, 5% and 48%, respectively. All other recoveries were within limits.
- 1549SB003(0.5-1.5)MS/MSD results: Of 130 recoveries, 7 were outside the established limits with all relative percent differences within limits. See form 3.
- Internal Standard Area Counts: Due to the sample matrix, area counts of d12-perylene were less than 50% of that found in the associated CCV at 41% in the undiluted analysis of sample 1034SB008 (0.5-1.5). All other internal standard area counts were within limits.
- Dilutions: All samples analyzed without dilution. Sample 1034SB008 (0.5-1.5) was also analyzed at a 10x dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.



Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

\nalyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

:xtract and hold all of the other "HOLD" samples.

am waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
ane

ane Kennedy
'rinciple Scientist
ARCADIS US, Inc.
850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002
'hone: (504) 832-4174 Ext 106
:ell: (225) 205-8256
-mail: jane.kennedy@arcadis-us.com

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rom: Sharpe, Christopher
ent: Friday, May 16, 2008 2:50 PM
o: Kennedy, Jane
c: Llewellyn, Tim; Quinnan, Joseph; Wisbeck, Diane; Powell, Jace'que
ubject: RE: using 12 samples

just got off of the phone with Joe Q re these samples.
.ets analyze the soil samples from 5DitchSB003 and 5DitchSB004 for VOCs only and discard the soil samples from
5DitchSB001 and 5ditchSB002

Tim and Diane agree that the potential cost savings for extract and hold on the 12 samples referenced below makes
ense so let's do that as well.

:TS

---

rom: Kennedy, Jane
ent: Friday, May 16, 2008 1:54 PM
o: Sharpe, Christopher
ubject: using 12 samples

1804.80 to extract and hold the 12 for SVOCs, PCBs, Explosives

/OCs are $1782 if we analyze the 12 remaining

ane Kennedy
'rinciple Scientist
ARCADIS US, Inc.
850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB00
3(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507404

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/07/08 10:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 12:35

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	34	430		U
208-96-8	Acenaphthylene	25	430		U
98-86-2	Acetophenone	53	430		U
1912-24-9	Atrazine	37	430		UY
120-12-7	Anthracene	35	430		U
100-52-7	Benzaldehyde	72	430		UY
56-55-3	Benzo(a)anthracene	47	170		U
205-99-2	Benzo(b)fluoranthene	41	170		U
207-08-9	Benzo(k)fluoranthene	51	430		U
191-24-2	Benzo(g,h,i)perylene	92	430		U
50-32-8	Benzo(a)pyrene	30	170		U
92-52-4	1,1'-Biphenyl	38	430		U
111-91-1	bis(2-Chloroethoxy)methane	40	430		U
111-44-4	bis(2-Chloroethyl)ether	53	430		U
108-60-1	bis(2-Chloroisopropyl)ether	66	430		U
117-81-7	Bis(2-ethylhexyl)phthalate	47	430		U
101-55-3	4-Bromophenyl-phenylether	34	430		U
85-68-7	Butylbenzylphthalate	38	430		U
105-60-2	Caprolactam	87	430	100	J
86-74-8	Carbazole	47	430		U
106-47-8	4-Chloroaniline	62	430		U
59-50-7	4-Chloro-3-methylphenol	36	430		U
91-58-7	2-Chloronaphthalene	41	430		U
95-57-8	2-Chlorophenol	53	430		U
7005-72-3	4-Chlorophenyl-phenylether	40	430		U
218-01-9	Chrysene	40	430		U
53-70-3	Dibenz(a,h)anthracene	78	170		U
132-64-9	Dibenzofuran	32	430		U
91-94-1	3,3'-Dichlorobenzidine	41	430		UY
120-83-2	2,4-Dichlorophenol	24	430		U
84-66-2	Diethylphthalate	44	430		U
105-67-9	2,4-Dimethylphenol	28	1700		U
131-11-3	Dimethylphthalate	40	430		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB00
3(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507404

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/07/08 10:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 12:35

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	39	430	43	J
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	31	430		U
606-20-2	2,6-Dinitrotoluene	49	430		U
117-84-0	Di-n-octylphthalate	35	430		U
206-44-0	Fluoranthene	69	430		U
86-73-7	Fluorene	34	430		U
118-74-1	Hexachlorobenzene	45	430		U
87-68-3	Hexachlorobutadiene	42	430		U
77-47-4	Hexachlorocyclopentadiene	79	430		UY
67-72-1	Hexachloroethane	51	430		U
193-39-5	Indeno(1,2,3-cd)pyrene	60	170		U
78-59-1	Isophorone	37	430		U
91-57-6	2-Methylnaphthalene	45	430		U
91-20-3	Naphthalene	42	430		U
95-48-7	2-Methylphenol	50	430		U
106-44-5	4-Methylphenol	34	430		U
88-74-4	2-Nitroaniline	42	1700		U
99-09-2	3-Nitroaniline	61	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	45	430		U
88-75-5	2-Nitrophenol	29	430		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	41	430		U
621-64-7	N-Nitroso-di-n-propylamine	71	430		U
87-86-5	Pentachlorophenol	44	1700		U
108-95-2	Phenol	47	430		U
129-00-0	Pyrene	52	430		U
95-94-3	1,2,4,5-Tetrachlorobenzene	130	430		U
95-95-4	2,4,5-Trichlorophenol	35	430		U
88-06-2	2,4,6-Trichlorophenol	45	430		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507405

% Moisture: 24 decanted: (Y/N) N Date Sampled: 05/07/08 10:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 13:02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	35	440		U
208-96-8	Acenaphthylene	26	440		U
98-86-2	Acetophenone	54	440		U
1912-24-9	Atrazine	37	440		UY
120-12-7	Anthracene	36	440		U
100-52-7	Benzaldehyde	73	440		UY
56-55-3	Benzo(a)anthracene	48	180		U
205-99-2	Benzo(b)fluoranthene	41	180		U
207-08-9	Benzo(k)fluoranthene	52	440		U
191-24-2	Benzo(g,h,i)perylene	93	440		U
50-32-8	Benzo(a)pyrene	30	180		U
92-52-4	1,1'-Biphenyl	39	440		U
111-91-1	bis(2-Chloroethoxy)methane	41	440		U
111-44-4	bis(2-Chloroethyl)ether	54	440		U
108-60-1	bis(2-Chloroisopropyl)ether	67	440		U
117-81-7	Bis(2-ethylhexyl)phthalate	47	440		U
101-55-3	4-Bromophenyl-phenylether	34	440		U
85-68-7	Butylbenzylphthalate	39	440		U
105-60-2	Caprolactam	88	440		U
86-74-8	Carbazole	48	440		U
106-47-8	4-Chloroaniline	63	440		U
59-50-7	4-Chloro-3-methylphenol	36	440		U
91-58-7	2-Chloronaphthalene	42	440		U
95-57-8	2-Chlorophenol	54	440		U
7005-72-3	4-Chlorophenyl-phenylether	40	440		U
218-01-9	Chrysene	41	440		U
53-70-3	Dibenz(a,h)anthracene	79	180		U
132-64-9	Dibenzofuran	32	440		U
91-94-1	3,3'-Dichlorobenzidine	41	440		UY
120-83-2	2,4-Dichlorophenol	25	440		U
84-66-2	Diethylphthalate	44	440		U
105-67-9	2,4-Dimethylphenol	28	1800		U
131-11-3	Dimethylphthalate	40	440		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507405

% Moisture: 24 decanted: (Y/N) N Date Sampled: 05/07/08 10:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 13:02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	40	440		U
534-52-1	4,6-Dinitro-2-methylphenol	29	1800		U
51-28-5	2,4-Dinitrophenol	180	1800		U
121-14-2	2,4-Dinitrotoluene	32	440		U
606-20-2	2,6-Dinitrotoluene	50	440		U
117-84-0	Di-n-octylphthalate	35	440		U
206-44-0	Fluoranthene	70	440		U
86-73-7	Fluorene	34	440		U
118-74-1	Hexachlorobenzene	46	440		U
87-68-3	Hexachlorobutadiene	43	440		U
77-47-4	Hexachlorocyclopentadiene	80	440		UY
67-72-1	Hexachloroethane	52	440		U
193-39-5	Indeno(1,2,3-cd)pyrene	60	180	180	
78-59-1	Isophorone	37	440		U
91-57-6	2-Methylnaphthalene	46	440		U
91-20-3	Naphthalene	43	440		U
95-48-7	2-Methylphenol	51	440		U
106-44-5	4-Methylphenol	35	440		U
88-74-4	2-Nitroaniline	42	1800		U
99-09-2	3-Nitroaniline	62	1800		U
100-01-6	4-Nitroaniline	130	1800		U
98-95-3	Nitrobenzene	45	440		U
88-75-5	2-Nitrophenol	29	440		U
100-02-7	4-Nitrophenol	110	1800		U
86-30-6	N-Nitrosodiphenylamine (1)	42	440		U
621-64-7	N-Nitroso-di-n-propylamine	72	440		U
87-86-5	Pentachlorophenol	44	1800		U
108-95-2	Phenol	47	440		U
129-00-0	Pyrene	52	440		U
95-94-3	1,2,4,5-Tetrachlorobenzene	130	440		U
95-95-4	2,4,5-Trichlorophenol	35	440		U
88-06-2	2,4,6-Trichlorophenol	46	440		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549DUP00
2(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507407

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 13:29

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	34	420		U
208-96-8	Acenaphthylene	25	420		U
98-86-2	Acetophenone	52	420		U
1912-24-9	Atrazine	36	420		UY
120-12-7	Anthracene	35	420		U
100-52-7	Benzaldehyde	71	420		UY
56-55-3	Benzo(a)anthracene	46	170		U
205-99-2	Benzo(b)fluoranthene	40	170		U
207-08-9	Benzo(k)fluoranthene	50	420		U
191-24-2	Benzo(g,h,i)perylene	90	420		U
50-32-8	Benzo(a)pyrene	29	170		U
92-52-4	1,1'-Biphenyl	38	420		U
111-91-1	bis(2-Chloroethoxy)methane	40	420		U
111-44-4	bis(2-Chloroethyl)ether	52	420		U
108-60-1	bis(2-Chloroisopropyl)ether	65	420		U
117-81-7	Bis(2-ethylhexyl)phthalate	46	420		U
101-55-3	4-Bromophenyl-phenylether	33	420		U
85-68-7	Butylbenzylphthalate	38	420		U
105-60-2	Caprolactam	86	420	140	J
86-74-8	Carbazole	46	420		U
106-47-8	4-Chloroaniline	61	420		U
59-50-7	4-Chloro-3-methylphenol	35	420		U
91-58-7	2-Chloronaphthalene	41	420		U
95-57-8	2-Chlorophenol	52	420		U
7005-72-3	4-Chlorophenyl-phenylether	39	420		U
218-01-9	Chrysene	40	420		U
53-70-3	Dibenz(a,h)anthracene	77	170		U
132-64-9	Dibenzofuran	31	420		U
91-94-1	3,3'-Dichlorobenzidine	40	420		UY
120-83-2	2,4-Dichlorophenol	24	420		U
84-66-2	Diethylphthalate	43	420		U
105-67-9	2,4-Dimethylphenol	27	1700		U
131-11-3	Dimethylphthalate	39	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549DUP00
2(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507407

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 13:29

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	39	420		U
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	31	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U
117-84-0	Di-n-octylphthalate	34	420		U
206-44-0	Fluoranthene	68	420		U
86-73-7	Fluorene	33	420		U
118-74-1	Hexachlorobenzene	44	420		U
87-68-3	Hexachlorobutadiene	42	420		U
77-47-4	Hexachlorocyclopentadiene	78	420		UY
67-72-1	Hexachloroethane	50	420		U
193-39-5	Indeno(1,2,3-cd)pyrene	59	170		U
78-59-1	Isophorone	36	420		U
91-57-6	2-Methylnaphthalene	44	420		U
91-20-3	Naphthalene	41	420		U
95-48-7	2-Methylphenol	49	420		U
106-44-5	4-Methylphenol	34	420		U
88-74-4	2-Nitroaniline	41	1700		U
99-09-2	3-Nitroaniline	60	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	44	420		U
88-75-5	2-Nitrophenol	28	420		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	41	420		U
621-64-7	N-Nitroso-di-n-propylamine	70	420		U
87-86-5	Pentachlorophenol	43	1700		U
108-95-2	Phenol	46	420		U
129-00-0	Pyrene	51	420		U
95-94-3	1,2,4,5-Tetrachlorobenzene	130	420		U
95-95-4	2,4,5-Trichlorophenol	34	420		U
88-06-2	2,4,6-Trichlorophenol	44	420		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507408

% Moisture: 17 decanted: (Y/N) N Date Sampled: 05/07/08 11:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 13:56

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
83-32-9	Acenaphthene	32	400		U
208-96-8	Acenaphthylene	24	400		U
98-86-2	Acetophenone	50	400		U
1912-24-9	Atrazine	34	400		UY
120-12-7	Anthracene	33	400		U
100-52-7	Benzaldehyde	67	400		UY
56-55-3	Benzo(a)anthracene	44	160		U
205-99-2	Benzo(b)fluoranthene	38	160		U
207-08-9	Benzo(k)fluoranthene	48	400		U
191-24-2	Benzo(g,h,i)perylene	85	400		U
50-32-8	Benzo(a)pyrene	28	160		U
92-52-4	1,1'-Biphenyl	36	400		U
111-91-1	bis(2-Chloroethoxy)methane	37	400		U
111-44-4	bis(2-Chloroethyl)ether	49	400		U
108-60-1	bis(2-Chloroisopropyl)ether	62	400		U
117-81-7	Bis(2-ethylhexyl)phthalate	44	400		U
101-55-3	4-Bromophenyl-phenylether	31	400		U
85-68-7	Butylbenzylphthalate	36	400		U
105-60-2	Caprolactam	82	400	140	J
86-74-8	Carbazole	44	400		U
106-47-8	4-Chloroaniline	58	400		U
59-50-7	4-Chloro-3-methylphenol	34	400		U
91-58-7	2-Chloronaphthalene	39	400		U
95-57-8	2-Chlorophenol	49	400		U
7005-72-3	4-Chlorophenyl-phenylether	37	400		U
218-01-9	Chrysene	37	400		U
53-70-3	Dibenz(a,h)anthracene	73	160		U
132-64-9	Dibenzofuran	30	400		U
91-94-1	3,3'-Dichlorobenzidine	38	400		UY
120-83-2	2,4-Dichlorophenol	23	400		U
84-66-2	Diethylphthalate	41	400		U
105-67-9	2,4-Dimethylphenol	26	1600		U
131-11-3	Dimethylphthalate	37	400		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507408

% Moisture: 17 decanted: (Y/N) N Date Sampled: 05/07/08 11:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 13:56

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	37	400	42	J
534-52-1	4,6-Dinitro-2-methylphenol	26	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	29	400		U
606-20-2	2,6-Dinitrotoluene	46	400		U
117-84-0	Di-n-octylphthalate	32	400		U
206-44-0	Fluoranthene	65	400		U
86-73-7	Fluorene	32	400		U
118-74-1	Hexachlorobenzene	42	400		U
87-68-3	Hexachlorobutadiene	40	400		U
77-47-4	Hexachlorocyclopentadiene	74	400		UY
67-72-1	Hexachloroethane	48	400		U
193-39-5	Indeno(1,2,3-cd)pyrene	56	160		U
78-59-1	Isophorone	34	400		U
91-57-6	2-Methylnaphthalene	42	400		U
91-20-3	Naphthalene	39	400		U
95-48-7	2-Methylphenol	47	400		U
106-44-5	4-Methylphenol	32	400		U
88-74-4	2-Nitroaniline	39	1600		U
99-09-2	3-Nitroaniline	57	1600		U
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	42	400		U
88-75-5	2-Nitrophenol	27	400		U
100-02-7	4-Nitrophenol	98	1600		U
86-30-6	N-Nitrosodiphenylamine (1)	39	400		U
621-64-7	N-Nitroso-di-n-propylamine	66	400		U
87-86-5	Pentachlorophenol	41	1600		U
108-95-2	Phenol	44	400		U
129-00-0	Pyrene	48	400		U
95-94-3	1,2,4,5-Tetrachlorobenzene	120	400		U
95-95-4	2,4,5-Trichlorophenol	32	400		U
88-06-2	2,4,6-Trichlorophenol	42	400		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507410

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/07/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 14:23

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	33	420		U
208-96-8	Acenaphthylene	25	420		U
98-86-2	Acetophenone	52	420		U
1912-24-9	Atrazine	36	420		UY
120-12-7	Anthracene	34	420		U
100-52-7	Benzaldehyde	70	420		UY
56-55-3	Benzo(a)anthracene	46	170		U
205-99-2	Benzo(b)fluoranthene	40	170		U
207-08-9	Benzo(k)fluoranthene	49	420		U
191-24-2	Benzo(g,h,i)perylene	89	420		U
50-32-8	Benzo(a)pyrene	29	170		U
92-52-4	1,1'-Biphenyl	37	420		U
111-91-1	bis(2-Chloroethoxy)methane	39	420		U
111-44-4	bis(2-Chloroethyl)ether	51	420		U
108-60-1	bis(2-Chloroisopropyl)ether	64	420		U
117-81-7	Bis(2-ethylhexyl)phthalate	45	420		U
101-55-3	4-Bromophenyl-phenylether	32	420		U
85-68-7	Butylbenzylphthalate	37	420		U
105-60-2	Caprolactam	85	420	120	J
86-74-8	Carbazole	45	420		U
106-47-8	4-Chloroaniline	60	420		U
59-50-7	4-Chloro-3-methylphenol	35	420		U
91-58-7	2-Chloronaphthalene	40	420		U
95-57-8	2-Chlorophenol	51	420		U
7005-72-3	4-Chlorophenyl-phenylether	39	420		U
218-01-9	Chrysene	39	420		U
53-70-3	Dibenz(a,h)anthracene	76	170		U
132-64-9	Dibenzofuran	31	420		U
91-94-1	3,3'-Dichlorobenzidine	40	420		UY
120-83-2	2,4-Dichlorophenol	24	420		U
84-66-2	Diethylphthalate	43	420		U
105-67-9	2,4-Dimethylphenol	27	1700		U
131-11-3	Dimethylphthalate	38	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507410

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/07/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 14:23

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
84-74-2	Di-n-butylphthalate	38	420		U
534-52-1	4,6-Dinitro-2-methylphenol	27	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U
117-84-0	Di-n-octylphthalate	34	420		U
206-44-0	Fluoranthene	67	420		U
86-73-7	Fluorene	33	420		U
118-74-1	Hexachlorobenzene	44	420		U
87-68-3	Hexachlorobutadiene	41	420		U
77-47-4	Hexachlorocyclopentadiene	77	420		UY
67-72-1	Hexachloroethane	49	420		U
193-39-5	Indeno(1,2,3-cd)pyrene	58	170		U
78-59-1	Isophorone	36	420		U
91-57-6	2-Methylnaphthalene	44	420		U
91-20-3	Naphthalene	41	420		U
95-48-7	2-Methylphenol	48	420		U
106-44-5	4-Methylphenol	33	420		U
88-74-4	2-Nitroaniline	40	1700		U
99-09-2	3-Nitroaniline	59	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	43	420		U
88-75-5	2-Nitrophenol	28	420		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	40	420		U
621-64-7	N-Nitroso-di-n-propylamine	69	420		U
87-86-5	Pentachlorophenol	42	1700		U
108-95-2	Phenol	45	420		U
129-00-0	Pyrene	50	420		U
95-94-3	1,2,4,5-Tetrachlorobenzene	120	420		U
95-95-4	2,4,5-Trichlorophenol	34	420		U
88-06-2	2,4,6-Trichlorophenol	44	420		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509501

% Moisture: 43 decanted: (Y/N) N Date Sampled: 05/08/08 18:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 14:50

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	46	580		U
208-96-8	Acenaphthylene	34	580		U
98-86-2	Acetophenone	72	580		U
1912-24-9	Atrazine	50	580		UY
120-12-7	Anthracene	48	580		U
100-52-7	Benzaldehyde	97	580		UY
56-55-3	Benzo(a)anthracene	64	230		U
205-99-2	Benzo(b)fluoranthene	55	230		U
207-08-9	Benzo(k)fluoranthene	69	580		U
191-24-2	Benzo(g,h,i)perylene	120	580		U
50-32-8	Benzo(a)pyrene	40	230		U
92-52-4	1,1'-Biphenyl	52	580		U
111-91-1	bis(2-Chloroethoxy)methane	54	580		U
111-44-4	bis(2-Chloroethyl)ether	72	580		U
108-60-1	bis(2-Chloroisopropyl)ether	90	580		U
117-81-7	Bis(2-ethylhexyl)phthalate	63	580		U
101-55-3	4-Bromophenyl-phenylether	45	580		U
85-68-7	Butylbenzylphthalate	52	580		U
105-60-2	Caprolactam	120	580	190	J
86-74-8	Carbazole	63	580		U
106-47-8	4-Chloroaniline	84	580		U
59-50-7	4-Chloro-3-methylphenol	49	580		U
91-58-7	2-Chloronaphthalene	56	580		U
95-57-8	2-Chlorophenol	72	580		U
7005-72-3	4-Chlorophenyl-phenylether	54	580		U
218-01-9	Chrysene	54	580		U
53-70-3	Dibenz(a,h)anthracene	100	230		U
132-64-9	Dibenzofuran	43	580		U
91-94-1	3,3'-Dichlorobenzidine	55	580		UY
120-83-2	2,4-Dichlorophenol	33	580		U
84-66-2	Diethylphthalate	60	580		U
105-67-9	2,4-Dimethylphenol	37	2300		U
131-11-3	Dimethylphthalate	54	580		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509501

% Moisture: 43 decanted: (Y/N) N Date Sampled: 05/08/08 18:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 14:50

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	53	580	56	J
534-52-1	4,6-Dinitro-2-methylphenol	38	2300		U
51-28-5	2,4-Dinitrophenol	230	2300		U
121-14-2	2,4-Dinitrotoluene	42	580		U
606-20-2	2,6-Dinitrotoluene	66	580		U
117-84-0	Di-n-octylphthalate	47	580		U
206-44-0	Fluoranthene	94	580		U
86-73-7	Fluorene	46	580		U
118-74-1	Hexachlorobenzene	61	580		U
87-68-3	Hexachlorobutadiene	58	580		U
77-47-4	Hexachlorocyclopentadiene	110	580		UY
67-72-1	Hexachloroethane	69	580		U
193-39-5	Indeno(1,2,3-cd)pyrene	81	230		U
78-59-1	Isophorone	50	580		U
91-57-6	2-Methylnaphthalene	61	580		U
91-20-3	Naphthalene	57	580		U
95-48-7	2-Methylphenol	68	580		U
106-44-5	4-Methylphenol	46	580		U
88-74-4	2-Nitroaniline	56	2300		U
99-09-2	3-Nitroaniline	83	2300		U
100-01-6	4-Nitroaniline	180	2300		U
98-95-3	Nitrobenzene	61	580		U
88-75-5	2-Nitrophenol	39	580		U
100-02-7	4-Nitrophenol	140	2300		U
86-30-6	N-Nitrosodiphenylamine (1)	56	580		U
621-64-7	N-Nitroso-di-n-propylamine	96	580		U
87-86-5	Pentachlorophenol	59	2300		U
108-95-2	Phenol	63	580		U
129-00-0	Pyrene	70	580		U
95-94-3	1,2,4,5-Tetrachlorobenzene	180	580		U
95-95-4	2,4,5-Trichlorophenol	47	580		U
88-06-2	2,4,6-Trichlorophenol	61	580		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
10341SB0
02 (1-2)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509503

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 19:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 15:16

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	39	430		U
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	31	430		U
606-20-2	2,6-Dinitrotoluene	49	430		U
117-84-0	Di-n-octylphthalate	35	430		U
206-44-0	Fluoranthene	69	430		U
86-73-7	Fluorene	34	430		U
118-74-1	Hexachlorobenzene	45	430		U
87-68-3	Hexachlorobutadiene	42	430		U
77-47-4	Hexachlorocyclopentadiene	79	430		UY
67-72-1	Hexachloroethane	51	430		U
193-39-5	Indeno(1,2,3-cd)pyrene	60	170		U
78-59-1	Isophorone	37	430		U
91-57-6	2-Methylnaphthalene	45	430		U
91-20-3	Naphthalene	42	430		U
95-48-7	2-Methylphenol	50	430		U
106-44-5	4-Methylphenol	34	430		U
88-74-4	2-Nitroaniline	42	1700		U
99-09-2	3-Nitroaniline	61	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	45	430		U
88-75-5	2-Nitrophenol	28	430		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	41	430		U
621-64-7	N-Nitroso-di-n-propylamine	71	430		U
87-86-5	Pentachlorophenol	44	1700		U
108-95-2	Phenol	47	430		U
129-00-0	Pyrene	51	430		U
95-94-3	1,2,4,5-Tetrachlorobenzene	130	430		U
95-95-4	2,4,5-Trichlorophenol	35	430		U
88-06-2	2,4,6-Trichlorophenol	45	430		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP002
(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805095-05

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: 0509505

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/08/08 11:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/12/08 15:57

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.70	5.6		U
208-96-8	Acenaphthylene	0.52	5.6		U
98-86-2	Acetophenone	0.83	5.6		U
1912-24-9	Atrazine	0.77	5.6		UY
120-12-7	Anthracene	0.86	5.6		U
100-52-7	Benzaldehyde	0.63	5.6		UY
56-55-3	Benzo(a)anthracene	1.0	5.6		U
205-99-2	Benzo(b)fluoranthene	0.79	5.6		U
207-08-9	Benzo(k)fluoranthene	0.56	5.6		U
191-24-2	Benzo(g,h,i)perylene	1.6	5.6		U
50-32-8	Benzo(a)pyrene	0.67	2.2		U
92-52-4	1,1'-Biphenyl	0.43	5.6		U
111-91-1	bis(2-Chloroethoxy)methane	0.58	5.6		U
111-44-4	bis(2-Chloroethyl)ether	0.50	5.6		U
108-60-1	bis(2-Chloroisopropyl)ether	0.94	5.6		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.4	5.6		U
101-55-3	4-Bromophenyl-phenylether	0.63	5.6		U
85-68-7	Butylbenzylphthalate	0.91	5.6		U
105-60-2	Caprolactam	0.40	5.6	1.7	J
86-74-8	Carbazole	0.77	5.6		UY
106-47-8	4-Chloroaniline	1.0	5.6		U
59-50-7	4-Chloro-3-methylphenol	0.64	5.6		U
91-58-7	2-Chloronaphthalene	0.64	5.6		U
95-57-8	2-Chlorophenol	0.66	5.6		U
7005-72-3	4-Chlorophenyl-phenylether	0.99	5.6		U
218-01-9	Chrysene	1.1	5.6		U
53-70-3	Dibenz(a,h)anthracene	1.9	5.6		U
132-64-9	Dibenzofuran	0.72	5.6		U
91-94-1	3,3'-Dichlorobenzidine	0.99	5.6		UY
120-83-2	2,4-Dichlorophenol	0.49	5.6		U
84-66-2	Diethylphthalate	1.1	5.6		U
105-67-9	2,4-Dimethylphenol	0.79	22		U
131-11-3	Dimethylphthalate	0.82	5.6		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP002
(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805095-05

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: 0509505

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/08/08 11:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/12/08 15:57

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.4	5.6		U
534-52-1	4,6-Dinitro-2-methylphenol	0.82	22		U
51-28-5	2,4-Dinitrophenol	0.94	56		U
121-14-2	2,4-Dinitrotoluene	0.54	5.6		U
606-20-2	2,6-Dinitrotoluene	0.73	5.6		U
117-84-0	Di-n-octylphthalate	0.37	5.6		U
206-44-0	Fluoranthene	0.78	5.6		U
86-73-7	Fluorene	0.61	5.6		U
118-74-1	Hexachlorobenzene	0.52	5.6		U
87-68-3	Hexachlorobutadiene	1.0	5.6		U
77-47-4	Hexachlorocyclopentadiene	0.99	5.6		UY
67-72-1	Hexachloroethane	0.51	5.6		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.6	5.6		UY
78-59-1	Isophorone	0.61	5.6		U
91-57-6	2-Methylnaphthalene	0.76	5.6		U
91-20-3	Naphthalene	0.50	5.6		U
95-48-7	2-Methylphenol	0.92	5.6		U
106-44-5	4-Methylphenol	0.86	5.6		U
88-74-4	2-Nitroaniline	1.3	22		U
99-09-2	3-Nitroaniline	1.2	22		U
100-01-6	4-Nitroaniline	2.3	22		U
98-95-3	Nitrobenzene	0.69	5.6		U
88-75-5	2-Nitrophenol	0.82	5.6		U
100-02-7	4-Nitrophenol	0.92	22		U
86-30-6	N-Nitrosodiphenylamine (1)	0.51	5.6		U
621-64-7	N-Nitroso-di-n-propylamine	1.0	5.6		U
87-86-5	Pentachlorophenol	1.1	22		U
108-95-2	Phenol	0.51	5.6		U
129-00-0	Pyrene	0.72	5.6		U
95-94-3	1,2,4,5-Tetrachlorobenzene	1.1	5.6		U
95-95-4	2,4,5-Trichlorophenol	0.56	5.6		U
88-06-2	2,4,6-Trichlorophenol	0.81	5.6		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509507

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 13:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 20:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	34	430		U
208-96-8	Acenaphthylene	26	430		U
98-86-2	Acetophenone	53	430		U
1912-24-9	Atrazine	37	430		UY
120-12-7	Anthracene	35	430		U
100-52-7	Benzaldehyde	72	430		UY
56-55-3	Benzo(a)anthracene	47	170		U
205-99-2	Benzo(b)fluoranthene	41	170		U
207-08-9	Benzo(k)fluoranthene	51	430		U
191-24-2	Benzo(g,h,i)perylene	92	430		U
50-32-8	Benzo(a)pyrene	30	170		U
92-52-4	1,1'-Biphenyl	38	430		U
111-91-1	bis(2-Chloroethoxy)methane	40	430		U
111-44-4	bis(2-Chloroethyl)ether	53	430		U
108-60-1	bis(2-Chloroisopropyl)ether	67	430		U
117-81-7	Bis(2-ethylhexyl)phthalate	47	430	51	J
101-55-3	4-Bromophenyl-phenylether	34	430		U
85-68-7	Butylbenzylphthalate	39	430		U
105-60-2	Caprolactam	88	430	160	J
86-74-8	Carbazole	47	430		U
106-47-8	4-Chloroaniline	62	430		U
59-50-7	4-Chloro-3-methylphenol	36	430		U
91-58-7	2-Chloronaphthalene	42	430		U
95-57-8	2-Chlorophenol	53	430		U
7005-72-3	4-Chlorophenyl-phenylether	40	430		U
218-01-9	Chrysene	40	430		U
53-70-3	Dibenz(a,h)anthracene	78	170		U
132-64-9	Dibenzofuran	32	430		U
91-94-1	3,3'-Dichlorobenzidine	41	430		UY
120-83-2	2,4-Dichlorophenol	24	430		U
84-66-2	Diethylphthalate	44	430	45	J
105-67-9	2,4-Dimethylphenol	28	1700		U
131-11-3	Dimethylphthalate	40	430		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509507

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 13:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 20:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	40	430	77	J
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	31	430		U
606-20-2	2,6-Dinitrotoluene	49	430		U
117-84-0	Di-n-octylphthalate	35	430		U
206-44-0	Fluoranthene	70	430		U
86-73-7	Fluorene	34	430		U
118-74-1	Hexachlorobenzene	45	430		U
87-68-3	Hexachlorobutadiene	43	430		U
77-47-4	Hexachlorocyclopentadiene	80	430		UY
67-72-1	Hexachloroethane	51	430		U
193-39-5	Indeno(1,2,3-cd)pyrene	60	170		U
78-59-1	Isophorone	37	430		U
91-57-6	2-Methylnaphthalene	45	430		U
91-20-3	Naphthalene	42	430		U
95-48-7	2-Methylphenol	50	430		U
106-44-5	4-Methylphenol	34	430		U
88-74-4	2-Nitroaniline	42	1700		U
99-09-2	3-Nitroaniline	62	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	45	430		U
88-75-5	2-Nitrophenol	29	430		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	42	430		U
621-64-7	N-Nitroso-di-n-propylamine	71	430		U
87-86-5	Pentachlorophenol	44	1700		U
108-95-2	Phenol	47	430		U
129-00-0	Pyrene	52	430		U
95-94-3	1,2,4,5-Tetrachlorobenzene	130	430		U
95-95-4	2,4,5-Trichlorophenol	35	430		U
88-06-2	2,4,6-Trichlorophenol	45	430		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509509

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/08/08 14:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 20:35

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	33	420		U
208-96-8	Acenaphthylene	25	420		U
98-86-2	Acetophenone	52	420		U
1912-24-9	Atrazine	36	420		UY
120-12-7	Anthracene	34	420		U
100-52-7	Benzaldehyde	70	420		UY
56-55-3	Benzo(a)anthracene	46	170		U
205-99-2	Benzo(b)fluoranthene	40	170		U
207-08-9	Benzo(k)fluoranthene	49	420		U
191-24-2	Benzo(g,h,i)perylene	89	420		U
50-32-8	Benzo(a)pyrene	29	170		U
92-52-4	1,1'-Biphenyl	37	420		U
111-91-1	bis(2-Chloroethoxy)methane	39	420		U
111-44-4	bis(2-Chloroethyl)ether	51	420		U
108-60-1	bis(2-Chloroisopropyl)ether	64	420		U
117-81-7	Bis(2-ethylhexyl)phthalate	45	420		U
101-55-3	4-Bromophenyl-phenylether	32	420		U
85-68-7	Butylbenzylphthalate	37	420		U
105-60-2	Caprolactam	85	420	190	J
86-74-8	Carbazole	46	420		U
106-47-8	4-Chloroaniline	60	420		U
59-50-7	4-Chloro-3-methylphenol	35	420		U
91-58-7	2-Chloronaphthalene	40	420		U
95-57-8	2-Chlorophenol	51	420		U
7005-72-3	4-Chlorophenyl-phenylether	39	420		U
218-01-9	Chrysene	39	420		U
53-70-3	Dibenz(a,h)anthracene	76	170		U
132-64-9	Dibenzofuran	31	420		U
91-94-1	3,3'-Dichlorobenzidine	40	420		UY
120-83-2	2,4-Dichlorophenol	24	420		U
84-66-2	Diethylphthalate	43	420		U
105-67-9	2,4-Dimethylphenol	27	1700		U
131-11-3	Dimethylphthalate	38	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509509

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/08/08 14:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 20:35

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	38	420	55	J
534-52-1	4,6-Dinitro-2-methylphenol	27	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U
117-84-0	Di-n-octylphthalate	34	420		U
206-44-0	Fluoranthene	67	420		U
86-73-7	Fluorene	33	420		U
118-74-1	Hexachlorobenzene	44	420		U
87-68-3	Hexachlorobutadiene	41	420		U
77-47-4	Hexachlorocyclopentadiene	77	420		UY
67-72-1	Hexachloroethane	49	420		U
193-39-5	Indeno(1,2,3-cd)pyrene	58	170		U
78-59-1	Isophorone	36	420		U
91-57-6	2-Methylnaphthalene	44	420		U
91-20-3	Naphthalene	41	420		U
95-48-7	2-Methylphenol	49	420		U
106-44-5	4-Methylphenol	33	420		U
88-74-4	2-Nitroaniline	40	1700		U
99-09-2	3-Nitroaniline	60	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	44	420		U
88-75-5	2-Nitrophenol	28	420		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	40	420		U
621-64-7	N-Nitroso-di-n-propylamine	69	420		U
87-86-5	Pentachlorophenol	42	1700		U
108-95-2	Phenol	45	420		U
129-00-0	Pyrene	50	420		U
95-94-3	1,2,4,5-Tetrachlorobenzene	120	420		U
95-95-4	2,4,5-Trichlorophenol	34	420		U
88-06-2	2,4,6-Trichlorophenol	44	420		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB008
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509511

% Moisture: 16 decanted: (Y/N) N Date Sampled: 05/08/08 15:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 21:02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	32	400	36	J
208-96-8	Acenaphthylene	23	400	470	
98-86-2	Acetophenone	49	400		U
1912-24-9	Atrazine	34	400		UY
120-12-7	Anthracene	32	400	140	J
100-52-7	Benzaldehyde	66	400		UY
56-55-3	Benzo(a)anthracene	44	160	2000	
205-99-2	Benzo(b)fluoranthene	38	160	2900	
207-08-9	Benzo(k)fluoranthene	47	400	2600	
191-24-2	Benzo(g,h,i)perylene	84	400	2400	X
50-32-8	Benzo(a)pyrene	27	160	3200	
92-52-4	1,1'-Biphenyl	35	400		U
111-91-1	bis(2-Chloroethoxy)methane	37	400		U
111-44-4	bis(2-Chloroethyl)ether	49	400		U
108-60-1	bis(2-Chloroisopropyl)ether	61	400		U
117-81-7	Bis(2-ethylhexyl)phthalate	43	400		U
101-55-3	4-Bromophenyl-phenylether	31	400		U
85-68-7	Butylbenzylphthalate	36	400		U
105-60-2	Caprolactam	80	400	140	J
86-74-8	Carbazole	43	400		U
106-47-8	4-Chloroaniline	57	400		U
59-50-7	4-Chloro-3-methylphenol	33	400		U
91-58-7	2-Chloronaphthalene	38	400		U
95-57-8	2-Chlorophenol	49	400		U
7005-72-3	4-Chlorophenyl-phenylether	37	400		U
218-01-9	Chrysene	37	400	2200	
53-70-3	Dibenz(a,h)anthracene	72	160	950	
132-64-9	Dibenzofuran	29	400		U
91-94-1	3,3'-Dichlorobenzidine	38	400		UY
120-83-2	2,4-Dichlorophenol	22	400		U
84-66-2	Diethylphthalate	40	400		U
105-67-9	2,4-Dimethylphenol	26	1600		U
131-11-3	Dimethylphthalate	36	400		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB008
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509511

% Moisture: 16 decanted: (Y/N) N Date Sampled: 05/08/08 15:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 21:02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	36	400	42	J
534-52-1	4,6-Dinitro-2-methylphenol	26	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	29	400		U
606-20-2	2,6-Dinitrotoluene	45	400		U
117-84-0	Di-n-octylphthalate	32	400		U
206-44-0	Fluoranthene	64	400	3000	
86-73-7	Fluorene	31	400	60	J
118-74-1	Hexachlorobenzene	42	400		U
87-68-3	Hexachlorobutadiene	39	400		U
77-47-4	Hexachlorocyclopentadiene	73	400		UY
67-72-1	Hexachloroethane	47	400		U
193-39-5	Indeno(1,2,3-cd)pyrene	55	160	1800	
78-59-1	Isophorone	34	400		U
91-57-6	2-Methylnaphthalene	42	400		U
91-20-3	Naphthalene	39	400	56	J
95-48-7	2-Methylphenol	46	400		U
106-44-5	4-Methylphenol	32	400		U
88-74-4	2-Nitroaniline	38	1600		U
99-09-2	3-Nitroaniline	56	1600		U
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	41	400		U
88-75-5	2-Nitrophenol	26	400		U
100-02-7	4-Nitrophenol	97	1600		U
86-30-6	N-Nitrosodiphenylamine (1)	38	400		U
621-64-7	N-Nitroso-di-n-propylamine	66	400		U
87-86-5	Pentachlorophenol	40	1600		U
108-95-2	Phenol	43	400		U
129-00-0	Pyrene	48	400	4900	X
95-94-3	1,2,4,5-Tetrachlorobenzene	120	400		U
95-95-4	2,4,5-Trichlorophenol	32	400		U
88-06-2	2,4,6-Trichlorophenol	42	400		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB008
(0.5-1.5)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509511D

% Moisture: 16 decanted: (Y/N) N Date Sampled: 05/08/08 15:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 17:29

Injection Volume: 0.5(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
83-32-9	Acenaphthene	320	4000		UD
208-96-8	Acenaphthylene	230	4000	400	JD
98-86-2	Acetophenone	490	4000		UD
1912-24-9	Atrazine	340	4000		UDY
120-12-7	Anthracene	320	4000		UD
100-52-7	Benzaldehyde	660	4000		UDY
56-55-3	Benzo(a)anthracene	440	1600	1800	D
205-99-2	Benzo(b)fluoranthene	380	1600	2700	D
207-08-9	Benzo(k)fluoranthene	470	4000	2400	JD
191-24-2	Benzo(g,h,i)perylene	840	4000	2100	JDX
50-32-8	Benzo(a)pyrene	270	1600	3000	D
92-52-4	1,1'-Biphenyl	350	4000		UD
111-91-1	bis(2-Chloroethoxy)methane	370	4000		UD
111-44-4	bis(2-Chloroethyl)ether	490	4000		UD
108-60-1	bis(2-Chloroisopropyl)ether	610	4000		UD
117-81-7	Bis(2-ethylhexyl)phthalate	430	4000		UD
101-55-3	4-Bromophenyl-phenylether	310	4000		UD
85-68-7	Butylbenzylphthalate	360	4000		UD
105-60-2	Caprolactam	800	4000		UD
86-74-8	Carbazole	430	4000		UD
106-47-8	4-Chloroaniline	570	4000		UD
59-50-7	4-Chloro-3-methylphenol	330	4000		UD
91-58-7	2-Chloronaphthalene	380	4000		UD
95-57-8	2-Chlorophenol	490	4000		UD
7005-72-3	4-Chlorophenyl-phenylether	370	4000		UD
218-01-9	Chrysene	370	4000	2300	JD
53-70-3	Dibenz(a,h)anthracene	720	1600	2200	D
132-64-9	Dibenzofuran	290	4000		UD
91-94-1	3,3'-Dichlorobenzidine	380	4000		UDY
120-83-2	2,4-Dichlorophenol	220	4000		UD
84-66-2	Diethylphthalate	400	4000		UD
105-67-9	2,4-Dimethylphenol	260	16000		UD
131-11-3	Dimethylphthalate	360	4000		UD

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB008
(0.5-1.5)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509511D

% Moisture: 16 decanted: (Y/N) N Date Sampled: 05/08/08 15:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 17:29

Injection Volume: 0.5(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	360	4000		UD
534-52-1	4,6-Dinitro-2-methylphenol	260	16000		UD
51-28-5	2,4-Dinitrophenol	1600	16000		UD
121-14-2	2,4-Dinitrotoluene	290	4000		UD
606-20-2	2,6-Dinitrotoluene	450	4000		UD
117-84-0	Di-n-octylphthalate	320	4000		UD
206-44-0	Fluoranthene	640	4000	3300	JD
86-73-7	Fluorene	310	4000		UD
118-74-1	Hexachlorobenzene	420	4000		UD
87-68-3	Hexachlorobutadiene	390	4000		UD
77-47-4	Hexachlorocyclopentadiene	730	4000		UDY
67-72-1	Hexachloroethane	470	4000		UD
193-39-5	Indeno(1,2,3-cd)pyrene	550	1600	2800	D
78-59-1	Isophorone	340	4000		UD
91-57-6	2-Methylnaphthalene	420	4000		UD
91-20-3	Naphthalene	390	4000		UD
95-48-7	2-Methylphenol	460	4000		UD
106-44-5	4-Methylphenol	320	4000		UD
88-74-4	2-Nitroaniline	380	16000		UD
99-09-2	3-Nitroaniline	560	16000		UD
100-01-6	4-Nitroaniline	1200	16000		UD
98-95-3	Nitrobenzene	410	4000		UD
88-75-5	2-Nitrophenol	260	4000		UD
100-02-7	4-Nitrophenol	970	16000		UD
86-30-6	N-Nitrosodiphenylamine (1)	380	4000		UD
621-64-7	N-Nitroso-di-n-propylamine	660	4000		UD
87-86-5	Pentachlorophenol	400	16000		UD
108-95-2	Phenol	430	4000		UD
129-00-0	Pyrene	480	4000	3900	JDX
95-94-3	1,2,4,5-Tetrachlorobenzene	1200	4000		UD
95-95-4	2,4,5-Trichlorophenol	320	4000		UD
88-06-2	2,4,6-Trichlorophenol	420	4000		UD

(1) - Cannot be separated from Diphenylamine

FORM 2
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Level: (low/med) LOW

	CLIENT SAMPLE NO.	S1 (2FP) #	S2 (PHL) #	S3 (NBZ) #	S4 (FBP) #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	SBLK0512BS1L	59	62	52	62	60	63			0
02	SBLK0512BS1	66	70	59	66	60	71			0
03	1549SB003(0.	64	67	57	66	68	73			0
04	1549SB001(0.	49	51	43	50	56	58			0
05	1549DUP002(0	34*	35*	30*	33*	35	36			4
06	1549SB004(0.	62	65	54	65	72	77			0
07	1549SB006(0.	60	63	53	61	70	68			0
08	1034SB004 (0	56	59	50	53	58	61			0
09	10341SB002 (	61	64	53	61	64	66			0
10	1549SB003(0.	54	57	47	52	56	54			0
11	1549SB003(0.	60	62	52	57	58	61			0
12	1034SB008 (0	61D	69D	50D	73D	88D	78D			0
13	1041SB004 (0	57	60	50	58	58	63			0
14	1034SB001 (0	74	79	67	78	80	89			0
15	1034SB008 (0	69	76	60	76	74	103			0
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

		EL QC LIMITS	SPIKE CONC (UG/KG)
S1 (2FP)	= 2-Fluorophenol	(35-105)	6700
S2 (PHL)	= Phenol-d6	(40-100)	6700
S3 (NBZ)	= Nitrobenzene-d5	(35-100)	3300
S4 (FBP)	= 2-Fluorobiphenyl	(45-105)	3300
S5 (TBP)	= 2,4,6-Tribromophenol	(35-125)	6700
S6 (TPH)	= Terphenyl-d14	(30-125)	3300

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate results reported from a diluted analysis

FORM 2
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

	CLIENT SAMPLE NO.	S1 (2FP) #	S2 (PHL) #	S3 (NBZ) #	S4 (FBP) #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	SBLK0512BW1	36	22	64	74	76	79			0
02	SBLK0512BW1L	39	23	70	78	82	78			0
03	1041HP002 (0	35	22	66	74	77	73			0
04										
05										
06										
07										
08										
09										
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28										
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30										

	EL QC LIMITS	SPIKE CONC (UG/L)
S1 (2FP) = 2-Fluorophenol	(20-110)	100
S2 (PHL) = Phenol-d6	(10-115)	100
S3 (NBZ) = Nitrobenzene-d5	(40-110)	50
S4 (FBP) = 2-Fluorobiphenyl	(50-110)	50
S5 (TBP) = 2,4,6-Tribromophenol	(40-125)	100
S6 (TPH) = Terphenyl-d14	(50-135)	50

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: SBLK0512BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
Acenaphthene	3333	0.0000	2420	73	45-110
Acenaphthylene	3333	0.0000	2334	70	45-105
Acetophenone	3333	0.0000	1489	45	35-110
Atrazine	3333	0.0000	1812	54*	55-105
Anthracene	3333	0.0000	2327	70	55-105
Benzaldehyde	3333	0.0000	161.4	5*	10-160
Benzo(a)anthracene	3333	0.0000	2095	63	50-110
Benzo(b)fluoranthene	3333	0.0000	2089	63	45-115
Benzo(k)fluoranthene	3333	0.0000	2127	64	45-125
Benzo(g,h,i)perylene	3333	0.0000	2583	77	40-125
Benzo(a)pyrene	3333	0.0000	2278	68	50-110
1,1'-Biphenyl	3333	0.0000	2131	64	45-110
bis(2-Chloroethoxy)meth	3333	0.0000	1983	59	45-110
bis(2-Chloroethyl)ether	3333	0.0000	1867	56	40-105
bis(2-Chloroisopropyl)e	3333	0.0000	1944	58	20-115
Bis(2-ethylhexyl)phthal	3333	0.0000	2233	67	45-125
4-Bromophenyl-phenyleth	3333	0.0000	1810	54	45-115
Butylbenzylphthalate	3333	0.0000	2227	67	50-125
Caprolactam	3333	0.0000	2716	81	50-110
Carbazole	3333	0.0000	2532	76	45-115
4-Chloroaniline	3333	0.0000	2238	67	10- 95
4-Chloro-3-methylphenol	3333	0.0000	2354	71	45-115
2-Chloronaphthalene	3333	0.0000	2120	64	45-105
2-Chlorophenol	3333	0.0000	2129	64	45-105
4-Chlorophenyl-phenylet	3333	0.0000	2134	64	45-110
Chrysene	3333	0.0000	2112	63	55-110
Dibenz(a,h)anthracene	3333	0.0000	2292	69	40-125
Dibenzofuran	3333	0.0000	2245	67	50-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: SBLK0512BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	3333	0.0000	1852	56	19-130
2,4-Dichlorophenol	3333	0.0000	2149	64	45-110
Diethylphthalate	3333	0.0000	2348	70	50-115
2,4-Dimethylphenol	3333	0.0000	2124	64	30-105
Dimethylphthalate	3333	0.0000	2197	66	50-110
Di-n-butylphthalate	3333	0.0000	2399	72	55-110
4,6-Dinitro-2-methylphe	3333	0.0000	1938	58	30-135
2,4-Dinitrophenol	3333	0.0000	1543	46	15-130
2,4-Dinitrotoluene	3333	0.0000	2481	74	50-115
2,6-Dinitrotoluene	3333	0.0000	2281	68	50-110
Di-n-octylphthalate	3333	0.0000	2352	70	40-130
Fluoranthene	3333	0.0000	2255	68	55-115
Fluorene	3333	0.0000	2284	68	50-110
Hexachlorobenzene	3333	0.0000	2236	67	45-120
Hexachlorobutadiene	3333	0.0000	1559	47	30-110
Hexachlorocyclopentadie	3333	0.0000	991.7	30	10-110
Hexachloroethane	3333	0.0000	1626	49	35-110
Indeno(1,2,3-cd)pyrene	3333	0.0000	2342	70	40-120
Isophorone	3333	0.0000	2044	61	45-110
2-Methylnaphthalene	3333	0.0000	2108	63	40-110
Naphthalene	3333	0.0000	1995	60	40-105
2-Methylphenol	3333	0.0000	2264	68	40-105
4-Methylphenol	3333	0.0000	2408	72	40-105
2-Nitroaniline	3333	0.0000	2050	62	45-120
3-Nitroaniline	3333	0.0000	2637	79	25-110
4-Nitroaniline	3333	0.0000	3599	108	35-115
Nitrobenzene	3333	0.0000	1621	49	40-115
2-Nitrophenol	3333	0.0000	2251	68	40-110

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: SBLK0512BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
4-Nitrophenol	3333	0.0000	1732	52	15-140
N-Nitrosodiphenylamine	3333	0.0000	2126	64	50-115
N-Nitroso-di-n-prop.(1)	3333	0.0000	2007	60	40-115
Pentachlorophenol	3333	0.0000	1712	51	25-120
Phenol	3333	0.0000	2153	64	40-100
Pyrene	3333	0.0000	2060	62	45-125
1,2,4,5-Tetrachlorobenz	3333	0.0000	1611	48*	50-150
2,4,5-Trichlorophenol	3333	0.0000	2189	66	50-110
2,4,6-Trichlorophenol	3333	0.0000	2030	61	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 3 out of 65 outside limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: SBLK0512BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
Acenaphthene	50.00	0.0000	46.01	92	45-110
Acenaphthylene	50.00	0.0000	44.06	88	50-105
Acetophenone	50.00	0.0000	35.18	70	50-110
Atrazine	50.00	0.0000	35.26	70	70-115
Anthracene	50.00	0.0000	44.72	89	55-110
Benzaldehyde	50.00	0.0000	36.74	73	10-180
Benzo(a)anthracene	50.00	0.0000	40.08	80	55-110
Benzo(b)fluoranthene	50.00	0.0000	42.63	85	45-120
Benzo(k)fluoranthene	50.00	0.0000	41.46	83	45-125
Benzo(g,h,i)perylene	50.00	0.0000	40.72	81	40-125
Benzo(a)pyrene	50.00	0.0000	43.34	87	55-110
1,1'-Biphenyl	50.00	0.0000	40.66	81	50-110
bis(2-Chloroethoxy)meth	50.00	0.0000	40.61	81	45-105
bis(2-Chloroethyl)ether	50.00	0.0000	38.48	77	35-110
bis(2-Chloroisopropyl)e	50.00	0.0000	39.67	79	25-130
Bis(2-ethylhexyl)phthal	50.00	0.0000	42.70	85	40-125
4-Bromophenyl-phenyleth	50.00	0.0000	35.71	71	50-115
Butylbenzylphthalate	50.00	0.0000	43.68	87	45-115
Caprolactam	50.00	0.9957	9.588	17*	20-110
Carbazole	50.00	0.0000	46.20	92	50-115
4-Chloroaniline	50.00	0.0000	36.52	73	15-110
4-Chloro-3-methylphenol	50.00	0.0000	44.04	88	45-110
2-Chloronaphthalene	50.00	0.0000	40.97	82	50-105
2-Chlorophenol	50.00	0.0000	39.47	79	35-105
4-Chlorophenyl-phenylet	50.00	0.0000	41.16	82	50-110
Chrysene	50.00	0.0000	41.21	82	55-110
Dibenz(a,h)anthracene	50.00	0.0000	38.54	77	40-125
Dibenzofuran	50.00	0.0000	42.33	85	55-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: SBLK0512BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	50.00	0.0000	32.68	65	20-110
2,4-Dichlorophenol	50.00	0.0000	41.76	84	50-105
Diethylphthalate	50.00	0.0000	45.46	91	40-120
2,4-Dimethylphenol	50.00	0.0000	44.48	89	30-110
Dimethylphthalate	50.00	0.0000	41.23	82	25-125
Di-n-butylphthalate	50.00	0.0000	45.31	91	55-115
4,6-Dinitro-2-methylphe	50.00	0.0000	65.13	130	40-130
2,4-Dinitrophenol	50.00	0.0000	84.13	168*	15-140
2,4-Dinitrotoluene	50.00	0.0000	46.79	94	50-120
2,6-Dinitrotoluene	50.00	0.0000	44.02	88	50-115
Di-n-octylphthalate	50.00	0.0000	46.61	93	35-135
Fluoranthene	50.00	0.0000	42.02	84	55-115
Fluorene	50.00	0.0000	43.02	86	50-110
Hexachlorobenzene	50.00	0.0000	44.11	88	50-110
Hexachlorobutadiene	50.00	0.0000	33.43	67	25-105
Hexachlorocyclopentadie	50.00	0.0000	27.28	54	10-110
Hexachloroethane	50.00	0.0000	36.28	72	30- 95
Indeno(1,2,3-cd)pyrene	50.00	0.0000	30.67	61	45-125
Isophorone	50.00	0.0000	41.44	83	50-110
2-Methylnaphthalene	50.00	0.0000	42.00	84	45-105
Naphthalene	50.00	0.0000	40.18	80	40-100
2-Methylphenol	50.00	0.0000	35.68	71	40-110
4-Methylphenol	50.00	0.0000	32.03	64	30-110
2-Nitroaniline	50.00	0.0000	38.09	76	50-115
3-Nitroaniline	50.00	0.0000	41.89	84	20-125
4-Nitroaniline	50.00	0.0000	58.94	118	35-120
Nitrobenzene	50.00	0.0000	32.54	65	45-110
2-Nitrophenol	50.00	0.0000	47.61	95	40-115

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: SBLK0512BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
4-Nitrophenol	50.00	0.0000	11.06	22	0-125
N-Nitrosodiphenylamine	50.00	0.0000	42.26	84	50-110
N-Nitroso-di-n-prop.(1)	50.00	0.0000	41.00	82	35-130
Pentachlorophenol	50.00	0.0000	51.42	103	40-115
Phenol	50.00	0.0000	14.06	28	0-115
Pyrene	50.00	0.0000	39.66	79	50-130
1,2,4,5-Tetrachlorobenz	50.00	0.0000	32.70	65	50-125
2,4,5-Trichlorophenol	50.00	0.0000	43.23	86	50-110
2,4,6-Trichlorophenol	50.00	0.0000	42.85	86	50-115

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 65 outside limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: 1549SB003(0.5-1. Lab Sample ID: 0805074-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
Acenaphthene	4323	0.0000	2683	62	45-110
Acenaphthylene	4323	0.0000	2608	60	45-105
Acetophenone	4323	0.0000	1688	39	35-110
Atrazine	4323	0.0000	2010	46*	55-105
Anthracene	4323	0.0000	2652	61	55-105
Benzaldehyde	4323	0.0000	128.4	3*	10-160
Benzo(a)anthracene	4323	0.0000	2299	53	50-110
Benzo(b)fluoranthene	4323	0.0000	2249	52	45-115
Benzo(k)fluoranthene	4323	0.0000	2334	54	45-125
Benzo(g,h,i)perylene	4323	0.0000	2356	54	40-125
Benzo(a)pyrene	4323	0.0000	2337	54	50-110
1,1'-Biphenyl	4323	0.0000	2302	53	45-110
bis(2-Chloroethoxy)meth	4323	0.0000	2247	52	45-110
bis(2-Chloroethyl)ether	4323	0.0000	2196	51	40-105
bis(2-Chloroisopropyl)e	4323	0.0000	2300	53	20-115
Bis(2-ethylhexyl)phthal	4323	0.0000	2508	58	45-125
4-Bromophenyl-phenyleth	4323	0.0000	1985	46	45-115
Butylbenzylphthalate	4323	0.0000	2567	59	50-125
Caprolactam	4323	103.3	3282	74	50-110
Carbazole	4323	0.0000	2749	64	45-115
4-Chloroaniline	4323	0.0000	2421	56	10- 95
4-Chloro-3-methylphenol	4323	0.0000	2896	67	45-115
2-Chloronaphthalene	4323	0.0000	2330	54	45-105
2-Chlorophenol	4323	0.0000	2480	57	45-105
4-Chlorophenyl-phenylet	4323	0.0000	2376	55	45-110
Chrysene	4323	0.0000	2335	54*	55-110
Dibenz(a,h)anthracene	4323	0.0000	2192	51	40-125
Dibenzofuran	4323	0.0000	2511	58	50-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: 1549SB003(0.5-1. Lab Sample ID: 0805074-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	4323	0.0000	2102	49	19-130
2,4-Dichlorophenol	4323	0.0000	2589	60	45-110
Diethylphthalate	4323	0.0000	2725	63	50-115
2,4-Dimethylphenol	4323	0.0000	2938	68	30-105
Dimethylphthalate	4323	0.0000	2440	56	50-110
Di-n-butylphthalate	4323	42.70	2724	62	55-110
4,6-Dinitro-2-methylphe	4323	0.0000	3522	81	30-135
2,4-Dinitrophenol	4323	0.0000	3948	91	15-130
2,4-Dinitrotoluene	4323	0.0000	2773	64	50-115
2,6-Dinitrotoluene	4323	0.0000	2496	58	50-110
Di-n-octylphthalate	4323	0.0000	2801	65	40-130
Fluoranthene	4323	0.0000	2506	58	55-115
Fluorene	4323	0.0000	2588	60	50-110
Hexachlorobenzene	4323	0.0000	2459	57	45-120
Hexachlorobutadiene	4323	0.0000	1937	45	30-110
Hexachlorocyclopentadie	4323	0.0000	891.0	21	10-110
Hexachloroethane	4323	0.0000	1897	44	35-110
Indeno(1,2,3-cd)pyrene	4323	0.0000	2220	51	40-120
Isophorone	4323	0.0000	2357	54	45-110
2-Methylnaphthalene	4323	0.0000	2420	56	40-110
Naphthalene	4323	0.0000	2273	52	40-105
2-Methylphenol	4323	0.0000	2528	58	40-105
4-Methylphenol	4323	0.0000	2784	64	40-105
2-Nitroaniline	4323	0.0000	2339	54	45-120
3-Nitroaniline	4323	0.0000	2942	68	25-110
4-Nitroaniline	4323	0.0000	4181	97	35-115
Nitrobenzene	4323	0.0000	1887	44	40-115
2-Nitrophenol	4323	0.0000	2740	63	40-110

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: 1549SB003(0.5-1. Lab Sample ID: 0805074-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
4-Nitrophenol	4323	0.0000	2160	50	15-140
N-Nitrosodiphenylamine	4323	0.0000	2419	56	50-115
N-Nitroso-di-n-prop.(1)	4323	0.0000	2052	47	40-115
Pentachlorophenol	4323	0.0000	2805	65	25-120
Phenol	4323	0.0000	2517	58	40-100
Pyrene	4323	0.0000	2310	53	45-125
1,2,4,5-Tetrachlorobenz	4323	0.0000	1936	45*	50-150
2,4,5-Trichlorophenol	4323	0.0000	2620	61	50-110
2,4,6-Trichlorophenol	4323	0.0000	2521	58	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: 1549SB003(0.5-1. Lab Sample ID: 0805074-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acenaphthene	4323	2958	68	10	30	45-110
Acenaphthylene	4323	2881	67	10	30	45-105
Acetophenone	4323	1874	43	10	30	35-110
Atrazine	4323	2162	50*	7	30	55-105
Anthracene	4323	2842	66	7	30	55-105
Benzaldehyde	4323	142.9	3*	11	30	10-160
Benzo(a)anthracene	4323	2512	58	9	30	50-110
Benzo(b)fluoranthene	4323	2781	64	21	30	45-115
Benzo(k)fluoranthene	4323	2439	56	4	30	45-125
Benzo(g,h,i)perylene	4323	2686	62	13	30	40-125
Benzo(a)pyrene	4323	2636	61	12	30	50-110
1,1'-Biphenyl	4323	2554	59	10	30	45-110
bis(2-Chloroethoxy)meth	4323	2416	56	7	30	45-110
bis(2-Chloroethyl)ether	4323	2510	58	13	30	40-105
bis(2-Chloroisopropyl)e	4323	2633	61	14	30	20-115
Bis(2-ethylhexyl)phthal	4323	2826	65	12	30	45-125
4-Bromophenyl-phenyleth	4323	2158	50	8	30	45-115
Butylbenzylphthalate	4323	2863	66	11	30	50-125
Caprolactam	4323	3549	80	8	30	50-110
Carbazole	4323	2967	69	8	30	45-115
4-Chloroaniline	4323	2517	58	4	30	10- 95
4-Chloro-3-methylphenol	4323	3036	70	5	30	45-115
2-Chloronaphthalene	4323	2621	61	12	30	45-105
2-Chlorophenol	4323	2789	64	12	30	45-105
4-Chlorophenyl-phenylet	4323	2632	61	10	30	45-110
Chrysene	4323	2572	59	10	30	55-110
Dibenz(a,h)anthracene	4323	2440	56	11	30	40-125
Dibenzofuran	4323	2773	64	10	30	50-105

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: 1549SB003(0.5-1. Lab Sample ID: 0805074-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
3,3'-Dichlorobenzidine	4323	2240	52	6	30	19-130
2,4-Dichlorophenol	4323	2796	65	8	30	45-110
Diethylphthalate	4323	2973	69	9	30	50-115
2,4-Dimethylphenol	4323	3271	76	11	30	30-105
Dimethylphthalate	4323	2670	62	9	30	50-110
Di-n-butylphthalate	4323	2885	66	6	30	55-110
4,6-Dinitro-2-methylphe	4323	3846	89	9	30	30-135
2,4-Dinitrophenol	4323	4765	110	19	30	15-130
2,4-Dinitrotoluene	4323	3051	70	10	30	50-115
2,6-Dinitrotoluene	4323	2753	64	10	30	50-110
Di-n-octylphthalate	4323	3212	74	14	30	40-130
Fluoranthene	4323	2668	62	6	30	55-115
Fluorene	4323	2874	66	10	30	50-110
Hexachlorobenzene	4323	2640	61	7	30	45-120
Hexachlorobutadiene	4323	2225	51	14	30	30-110
Hexachlorocyclopentadie	4323	914.7	21	3	30	10-110
Hexachloroethane	4323	2188	51	14	30	35-110
Indeno(1,2,3-cd)pyrene	4323	2470	57	11	30	40-120
Isophorone	4323	2544	59	8	30	45-110
2-Methylnaphthalene	4323	2653	61	9	30	40-110
Naphthalene	4323	2507	58	10	30	40-105
2-Methylphenol	4323	2713	63	7	30	40-105
4-Methylphenol	4323	2870	66	3	30	40-105
2-Nitroaniline	4323	2574	60	10	30	45-120
3-Nitroaniline	4323	3079	71	4	30	25-110
4-Nitroaniline	4323	4456	103	6	30	35-115
Nitrobenzene	4323	2140	50	12	30	40-115
2-Nitrophenol	4323	3088	71	12	30	40-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: 1549SB003(0.5-1. Lab Sample ID: 0805074-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
4-Nitrophenol	4323	2330	54	8	30	15-140
N-Nitrosodiphenylamine	4323	2648	61	9	30	50-115
N-Nitroso-di-n-prop.(1)	4323	2245	52	9	30	40-115
Pentachlorophenol	4323	2907	67	4	30	25-120
Phenol	4323	2774	64	10	30	40-100
Pyrene	4323	2595	60	12	30	45-125
1,2,4,5-Tetrachlorobenz	4323	2130	49*	10	30	50-150
2,4,5-Trichlorophenol	4323	2926	68	11	30	50-110
2,4,6-Trichlorophenol	4323	2835	66	12	30	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 65 outside limits
Spike Recovery: 7 out of 130 outside limits

COMMENTS: _____

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0512BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: S1BS0512 Lab Sample ID: SBLK0512BS1

Instrument ID: BNA3 Date Extracted: 05/12/08

Matrix: (soil/water) SOIL Date Analyzed: 05/13/08

Level:(low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1209

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0512BS1L	SBLK0512BS1LCS	S1LS0512	05/13/08
02	1549SB003(0.	0805074-04	0507404	05/13/08
03	1549SB001(0.	0805074-05	0507405	05/13/08
04	1549DUP002(0	0805074-07	0507407	05/13/08
05	1549SB004(0.	0805074-08	0507408	05/13/08
06	1549SB006(0.	0805074-10	0507410	05/13/08
07	1034SB004 (0	0805095-01	0509501	05/13/08
08	10341SB002 (	0805095-03	0509503	05/13/08
09	1549SB003(0.	0805074-04	0507404M	05/13/08
10	1549SB003(0.	0805074-04	0507404S	05/13/08
11	1034SB008 (0	0805095-11DL	0509511D	05/13/08
12	1041SB004 (0	0805095-07	0509507	05/13/08
13	1034SB001 (0	0805095-09	0509509	05/13/08
14	1034SB008 (0	0805095-11	0509511	05/13/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0512BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0512BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0512

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 12:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	26	330		U
208-96-8	Acenaphthylene	20	330		U
98-86-2	Acetophenone	41	330		U
1912-24-9	Atrazine	28	330		UY
120-12-7	Anthracene	27	330		U
100-52-7	Benzaldehyde	55	330		UY
56-55-3	Benzo(a)anthracene	36	130		U
205-99-2	Benzo(b)fluoranthene	32	130		U
207-08-9	Benzo(k)fluoranthene	39	330		U
191-24-2	Benzo(g,h,i)perylene	70	330		U
50-32-8	Benzo(a)pyrene	23	130		U
92-52-4	1,1'-Biphenyl	29	330		U
111-91-1	bis(2-Chloroethoxy)methane	31	330		U
111-44-4	bis(2-Chloroethyl)ether	41	330		U
108-60-1	bis(2-Chloroisopropyl)ether	51	330		U
117-81-7	Bis(2-ethylhexyl)phthalate	36	330		U
101-55-3	4-Bromophenyl-phenylether	26	330		U
85-68-7	Butylbenzylphthalate	30	330		U
105-60-2	Caprolactam	67	330		U
86-74-8	Carbazole	36	330		UY
106-47-8	4-Chloroaniline	48	330		U
59-50-7	4-Chloro-3-methylphenol	28	330		U
91-58-7	2-Chloronaphthalene	32	330		U
95-57-8	2-Chlorophenol	41	330		U
7005-72-3	4-Chlorophenyl-phenylether	31	330		U
218-01-9	Chrysene	31	330		U
53-70-3	Dibenz(a,h)anthracene	60	130		U
132-64-9	Dibenzofuran	24	330		U
91-94-1	3,3'-Dichlorobenzidine	31	330		UY
120-83-2	2,4-Dichlorophenol	19	330		U
84-66-2	Diethylphthalate	34	330		U
105-67-9	2,4-Dimethylphenol	21	1300		U
131-11-3	Dimethylphthalate	30	330		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0512BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0512BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0512

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 12:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: MDL	(ug/L or ug/Kg) RL	UG/KG CONC	Q
84-74-2	Di-n-butylphthalate	30	330		U
534-52-1	4,6-Dinitro-2-methylphenol	22	1300		U
51-28-5	2,4-Dinitrophenol	130	1300		U
121-14-2	2,4-Dinitrotoluene	24	330		U
606-20-2	2,6-Dinitrotoluene	38	330		U
117-84-0	Di-n-octylphthalate	27	330		U
206-44-0	Fluoranthene	54	330		U
86-73-7	Fluorene	26	330		U
118-74-1	Hexachlorobenzene	35	330		U
87-68-3	Hexachlorobutadiene	33	330		U
77-47-4	Hexachlorocyclopentadiene	61	330		UY
67-72-1	Hexachloroethane	39	330		U
193-39-5	Indeno(1,2,3-cd)pyrene	46	130		UY
78-59-1	Isophorone	28	330		U
91-57-6	2-Methylnaphthalene	35	330		U
91-20-3	Naphthalene	32	330		U
95-48-7	2-Methylphenol	39	330		U
106-44-5	4-Methylphenol	26	330		U
88-74-4	2-Nitroaniline	32	1300		U
99-09-2	3-Nitroaniline	47	1300		U
100-01-6	4-Nitroaniline	100	1300		U
98-95-3	Nitrobenzene	34	330		U
88-75-5	2-Nitrophenol	22	330		U
100-02-7	4-Nitrophenol	81	1300		U
86-30-6	N-Nitrosodiphenylamine (1)	32	330		U
621-64-7	N-Nitroso-di-n-propylamine	55	330		U
87-86-5	Pentachlorophenol	34	1300		U
108-95-2	Phenol	36	330		U
129-00-0	Pyrene	40	330		U
95-94-3	1,2,4,5-Tetrachlorobenzene	100	330		U
95-95-4	2,4,5-Trichlorophenol	27	330		U
88-06-2	2,4,6-Trichlorophenol	35	330		U

(1) - Cannot be separated from Diphenylamine

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0512BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: S1BW0512 Lab Sample ID: SBLK0512BW1

Instrument ID: BNA3 Date Extracted: 05/12/08

Matrix: (soil/water) WATER Date Analyzed: 05/12/08

Level: (low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1409

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0512BW1L	SBLK0512BW1LCS	S1LW0512	05/12/08
02	1041HP002 (0	0805095-05	0509505	05/12/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0512BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: SBLK0512BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0512

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/12/08 14:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.63	5.0		U
208-96-8	Acenaphthylene	0.47	5.0		U
98-86-2	Acetophenone	0.75	5.0		U
1912-24-9	Atrazine	0.69	5.0		UY
120-12-7	Anthracene	0.77	5.0		U
100-52-7	Benzaldehyde	0.57	5.0		UY
56-55-3	Benzo(a)anthracene	0.91	5.0		U
205-99-2	Benzo(b)fluoranthene	0.71	5.0		U
207-08-9	Benzo(k)fluoranthene	0.50	5.0		U
191-24-2	Benzo(g,h,i)perylene	1.5	5.0		U
50-32-8	Benzo(a)pyrene	0.60	2.0		U
92-52-4	1,1'-Biphenyl	0.39	5.0		U
111-91-1	bis(2-Chloroethoxy)methane	0.52	5.0		U
111-44-4	bis(2-Chloroethyl)ether	0.45	5.0		U
108-60-1	bis(2-Chloroisopropyl)ether	0.85	5.0		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.3	5.0		U
101-55-3	4-Bromophenyl-phenylether	0.57	5.0		U
85-68-7	Butylbenzylphthalate	0.82	5.0		U
105-60-2	Caprolactam	0.36	5.0	1.0	J
86-74-8	Carbazole	0.69	5.0		UY
106-47-8	4-Chloroaniline	0.95	5.0		U
59-50-7	4-Chloro-3-methylphenol	0.58	5.0		U
91-58-7	2-Chloronaphthalene	0.58	5.0		U
95-57-8	2-Chlorophenol	0.59	5.0		U
7005-72-3	4-Chlorophenyl-phenylether	0.89	5.0		U
218-01-9	Chrysene	1.0	5.0		U
53-70-3	Dibenz(a,h)anthracene	1.7	5.0		U
132-64-9	Dibenzofuran	0.65	5.0		U
91-94-1	3,3'-Dichlorobenzidine	0.89	5.0		UY
120-83-2	2,4-Dichlorophenol	0.44	5.0		U
84-66-2	Diethylphthalate	1.0	5.0		U
105-67-9	2,4-Dimethylphenol	0.71	20		U
131-11-3	Dimethylphthalate	0.74	5.0		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0512BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: SBLK0512BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0512

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/12/08 14:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.3	5.0		U
534-52-1	4,6-Dinitro-2-methylphenol	0.74	20		U
51-28-5	2,4-Dinitrophenol	0.85	50		U
121-14-2	2,4-Dinitrotoluene	0.49	5.0		U
606-20-2	2,6-Dinitrotoluene	0.66	5.0		U
117-84-0	Di-n-octylphthalate	0.33	5.0		U
206-44-0	Fluoranthene	0.70	5.0		U
86-73-7	Fluorene	0.55	5.0		U
118-74-1	Hexachlorobenzene	0.47	5.0		U
87-68-3	Hexachlorobutadiene	0.93	5.0		U
77-47-4	Hexachlorocyclopentadiene	0.89	5.0		UY
67-72-1	Hexachloroethane	0.46	5.0		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.4	5.0		UY
78-59-1	Isophorone	0.55	5.0		U
91-57-6	2-Methylnaphthalene	0.68	5.0		U
91-20-3	Naphthalene	0.45	5.0		U
95-48-7	2-Methylphenol	0.83	5.0		U
106-44-5	4-Methylphenol	0.77	5.0		U
88-74-4	2-Nitroaniline	1.2	20		U
99-09-2	3-Nitroaniline	1.0	20		U
100-01-6	4-Nitroaniline	2.0	20		U
98-95-3	Nitrobenzene	0.62	5.0		U
88-75-5	2-Nitrophenol	0.74	5.0		U
100-02-7	4-Nitrophenol	0.83	20		U
86-30-6	N-Nitrosodiphenylamine (1)	0.46	5.0		U
621-64-7	N-Nitroso-di-n-propylamine	0.90	5.0		U
87-86-5	Pentachlorophenol	1.0	20		U
108-95-2	Phenol	0.46	5.0		U
129-00-0	Pyrene	0.65	5.0		U
95-94-3	1,2,4,5-Tetrachlorobenzene	1.0	5.0		U
95-95-4	2,4,5-Trichlorophenol	0.50	5.0		U
88-06-2	2,4,6-Trichlorophenol	0.73	5.0		U

(1) - Cannot be separated from Diphenylamine

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA96567

Lab File ID: DF0516B1 DFTPP Injection Date: 05/16/07

Instrument ID: BNA3 DFTPP Injection Time: 1155

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	45.0
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	47.6
70	Less than 2.0% of mass 69	0.2 (0.3)1
127	40.0 - 60.0% of mass 198	50.9
197	Less than 1.0% of mass 198	0.3
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.0
275	10.0 - 30.0% of mass 198	27.2
365	Greater than 1.0% of mass 198	3.21
441	Present, but less than mass 443	10.4
442	Greater than 40.0% of mass 198	65.8
443	17.0 - 23.0% of mass 442	12.0 (18.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACAL100PPM	BNACAL100PPM	CAL100	05/16/07	1218
02	BNACAL90PPM	BNACAL90PPM	CAL090	05/16/07	1247
03	BNACAL80PPM	BNACAL80PPM	CAL080	05/16/07	1317
04	BNACAL60PPM	BNACAL60PPM	CAL060	05/16/07	1417
05	BNACAL50PPM	BNACAL50PPM	CAL050	05/16/07	1447
06	BNACAL40PPM	BNACAL40PPM	CAL040	05/16/07	1517
07	BNACAL30PPM	BNACAL30PPM	CAL030	05/16/07	1546
08	BNACAL20PPM	BNACAL20PPM	CAL020	05/16/07	1616
09	BNACAL10PPM	BNACAL10PPM	CAL010	05/16/07	1645
10	BNACAL5PPM	BNACAL5PPM	CAL005	05/16/07	1715
11	BNACAL2PPM	BNACAL2PPM	CAL002	05/16/07	1744
12	BNACAL1PPM	BNACAL1PPM	CAL001	05/16/07	1813
13		BNACAL2PPM	CALB002	05/16/07	1843
14		BNACAL5PPM	CALB005	05/16/07	1912
15		BNACAL10PPM	CALB010	05/16/07	1941
16		BNACAL20PPM	CALB020	05/16/07	2011
17		BNACAL30PPM	CALB030	05/16/07	2039
18		BNACAL30PPM	CALB040	05/16/07	2108
19		BNACAL50PPM	CALB050	05/16/07	2137
20		BNACAL60PPM	CALB060	05/16/07	2206
21		BNACAL70PPM	CALB070	05/16/07	2235
22					

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA96567

Lab File ID: DF0516B2 DFTPP Injection Date: 05/16/07

Instrument ID: BNA3 DFTPP Injection Time: 2256

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	46.3
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	49.2
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	40.0 - 60.0% of mass 198	52.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.1
275	10.0 - 30.0% of mass 198	25.8
365	Greater than 1.0% of mass 198	2.99
441	Present, but less than mass 443	8.7
442	Greater than 40.0% of mass 198	55.3
443	17.0 - 23.0% of mass 442	10.3 (18.6)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		BNACAL80PPM	CALB080	05/16/07	2319
02		BNACAL90PPM	CALB090	05/16/07	2348
03		BNACAL100PPM	CALB100	05/17/07	0017
04		BNACAL002PPM	CALA002	05/17/07	0046
05		BNACAL005PPM	CALA005	05/17/07	0114
06		BNACAL010PPM	CALA010	05/17/07	0143
07		BNACAL020PPM	CALA020	05/17/07	0212
08		BNACAL030PPM	CALA030	05/17/07	0240
09		BNACAL050PPM	CALA050	05/17/07	0309
10		BNACAL070PPM	CALA070	05/17/07	0337
11		BNACAL100PPM	CALA100	05/17/07	0406
12		BNAICV-050PPM	ICV03	05/17/07	0601
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA36819

Lab File ID: DF0108B1 DFTPP Injection Date: 01/08/08

Instrument ID: BNA3 DFTPP Injection Time: 1200

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	35.5
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	40.5
70	Less than 2.0% of mass 69	0.2 (0.6)1
127	40.0 - 60.0% of mass 198	49.7
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	28.1
365	Greater than 1.0% of mass 198	3.65
441	Present, but less than mass 443	11.5
442	Greater than 40.0% of mass 198	74.2
443	17.0 - 23.0% of mass 442	14.4 (19.4)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	2CMPCAL100PP	2CMPCAL100PPM	2CPCAL13	01/08/08	1306
02	2CMPCAL70PPM	2CMPCAL70PPM	2CPCAL10	01/08/08	1339
03	2CMPCAL50PPM	2CMPCAL50PPM	2CPCAL08	01/08/08	1413
04	2CMPCAL20PPM	2CMPCAL20PPM	2CPCAL05	01/08/08	1446
05	2CMPCAL10PPM	2CMPCAL10PPM	2CPCAL04	01/08/08	1519
06	2CMPCAL5PPM	2CMPCAL5PPM	2CPCAL03	01/08/08	1551
07	2CMPCAL2PPM	2CMPCAL2PPM	2CPCAL02	01/08/08	1624
08	2CMPCAL1PPM	2CMPCAL1PPM	2CPCAL01	01/08/08	1657
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: DF0512B1 DFTPP Injection Date: 05/12/08

Instrument ID: BNA3 DFTPP Injection Time: 0945

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	40.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	46.5
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	40.0 - 60.0% of mass 198	52.9
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	28.2
365	Greater than 1.0% of mass 198	3.70
441	Present, but less than mass 443	12.2
442	Greater than 40.0% of mass 198	76.9
443	17.0 - 23.0% of mass 442	15.1 (19.7)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACCV50PPM	BNACCV50PPM	CCV050	05/12/08	1006
02	SBLK0512BW1	SBLK0512BW1	S1BW0512	05/12/08	1409
03	SBLK0512BW1L	SBLK0512BW1LCS	S1LW0512	05/12/08	1436
04	1041HP002 (0	0805095-05	0509505	05/12/08	1557
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID: DF0513B1 DFTPP Injection Date: 05/13/08

Instrument ID: BNA3 DFTPP Injection Time: 0940

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	43.2
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	47.9
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	40.0 - 60.0% of mass 198	54.1
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	27.8
365	Greater than 1.0% of mass 198	3.39
441	Present, but less than mass 443	11.4
442	Greater than 40.0% of mass 198	72.8
443	17.0 - 23.0% of mass 442	14.1 (19.4)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACCV50PPM	BNACCV50PPM	CCV050S	05/13/08	1115
02	SBLK0512BS1L	SBLK0512BS1LCS	S1LS0512	05/13/08	1142
03	SBLK0512BS1	SBLK0512BS1	S1BS0512	05/13/08	1209
04	1549SB003(0.	0805074-04	0507404	05/13/08	1235
05	1549SB001(0.	0805074-05	0507405	05/13/08	1302
06	1549DUP002(0	0805074-07	0507407	05/13/08	1329
07	1549SB004(0.	0805074-08	0507408	05/13/08	1356
08	1549SB006(0.	0805074-10	0507410	05/13/08	1423
09	1034SB004 (0	0805095-01	0509501	05/13/08	1450
10	10341SB002 (	0805095-03	0509503	05/13/08	1516
11	1549SB003(0.	0805074-04	0507404M	05/13/08	1543
12	1549SB003(0.	0805074-04	0507404S	05/13/08	1610
13	1034SB008 (0	0805095-11DL	0509511D	05/13/08	1729
14	1041SB004 (0	0805095-07	0509507	05/13/08	2009
15	1034SB001 (0	0805095-09	0509509	05/13/08	2035
16	1034SB008 (0	0805095-11	0509511	05/13/08	2102
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FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): CCV050 Date Analyzed: 05/12/08

Instrument ID: BNA3 Time Analyzed: 1006

		IS1 (DCB) AREA	#	RT	#	IS2 (NPT) AREA	#	RT	#	IS3 (ANT) AREA	#	RT	#
	12 HOUR STD	917220		3.69		3467361		5.00		1893442		6.91	
	UPPER LIMIT	1834440		4.19		6934722		5.50		3786884		7.41	
	LOWER LIMIT	458610		3.19		1733681		4.50		946721		6.41	
	CLIENT SAMPLE NO.												
01	SBLK0512BW1	1107201		3.69		4063695		4.99		2197593		6.91	
02	SBLK0512BW1L	1127435		3.69		4276474		5.00		2397663		6.91	
03	1041HP002 (0	1117045		3.69		4119639		4.99		2235643		6.91	
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IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): CCV050 Date Analyzed: 05/12/08

Instrument ID: BNA3 Time Analyzed: 1006

		IS4(PHN) AREA	#	RT	#	IS5(CRY) AREA	#	RT	#	IS6(PRY) AREA	#	RT	#
	12 HOUR STD	3030549		8.52		2625926		11.35		1980773		12.68	
	UPPER LIMIT	6061098		9.02		5251852		11.85		3961546		13.18	
	LOWER LIMIT	1515275		8.02		1312963		10.85		990387		12.18	
	CLIENT SAMPLE NO.												
01	SBLK0512BW1	3372277		8.52		2871298		11.34		2046513		12.67	
02	SBLK0512BW1L	3771523		8.52		3188002		11.35		2229295		12.68	
03	1041HP002 (0	3494949		8.52		3142101		11.35		2347979		12.67	
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IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): CCV050S Date Analyzed: 05/13/08

Instrument ID: BNA3 Time Analyzed: 1115

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	1180188	3.68	4430055	4.99	2447513	6.90
	UPPER LIMIT	2360376	4.18	8860110	5.49	4895026	7.40
	LOWER LIMIT	590094	3.18	2215028	4.49	1223757	6.40
	CLIENT SAMPLE NO.						
01	SBLK0512BS1L	1406863	3.68	5321290	4.98	2905067	6.90
02	SBLK0512BS1	1288843	3.68	4755385	4.98	2593993	6.90
03	1549SB003(0.	1431249	3.68	5282354	4.98	2843749	6.90
04	1549SB001(0.	1351746	3.69	4978058	4.98	2694774	6.90
05	1549DUP002(0	1461035	3.69	5299097	4.98	2925289	6.90
06	1549SB004(0.	1346763	3.69	4917585	4.98	2640125	6.90
07	1549SB006(0.	1287673	3.68	4767295	4.98	2652167	6.90
08	1034SB004 (0	1405167	3.68	4846029	4.98	2706913	6.90
09	10341SB002 (	1377151	3.68	5122561	4.98	2804319	6.90
10	1549SB003(0.	1323994	3.68	4590282	4.98	2696091	6.90
11	1549SB003(0.	1336855	3.68	4669269	4.98	2638219	6.90
12	1034SB008 (0	1188871	3.68	4401372	4.98	2364470	6.90
13	1041SB004 (0	1379698	3.69	5053445	4.98	2751972	6.90
14	1034SB001 (0	1428530	3.69	5225878	4.98	2906829	6.90
15	1034SB008 (0	1337485	3.69	4913239	4.98	2629237	6.90
16							
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22							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD001

Lab File ID (Standard): CCV050S Date Analyzed: 05/13/08

Instrument ID: BNA3 Time Analyzed: 1115

		IS4(PHN) AREA	#	RT	#	IS5(CRY) AREA	#	RT	#	IS6(PRY) AREA	#	RT	#
	12 HOUR STD	3915133		8.52		3636611		11.34		2664289		12.67	
	UPPER LIMIT	7830266		9.02		7273222		11.84		5328578		13.17	
	LOWER LIMIT	1957567		8.02		1818306		10.84		1332145		12.17	
	CLIENT SAMPLE NO.												
01	SBLK0512BS1L	4640979		8.51		4101808		11.34		3090010		12.67	
02	SBLK0512BS1	4011232		8.51		3579395		11.34		2762559		12.67	
03	1549SB003(0.	4458195		8.51		3621960		11.34		2596935		12.67	
04	1549SB001(0.	4187037		8.51		3685523		11.34		2804584		12.67	
05	1549DUP002(0	4494263		8.51		3517709		11.34		2592592		12.66	
06	1549SB004(0.	4073499		8.51		3021515		11.34		2081440		12.66	
07	1549SB006(0.	4174080		8.51		3779088		11.34		2788005		12.66	
08	1034SB004 (0	4303125		8.51		3493077		11.34		2425081		12.66	
09	10341SB002 (	4371924		8.51		3645937		11.34		2603773		12.67	
10	1549SB003(0.	4390927		8.52		3831869		11.34		2625529		12.67	
11	1549SB003(0.	4369458		8.52		3549776		11.34		2299578		12.67	
12	1034SB008 (0	3652927		8.51		2902601		11.34		1775737		12.66	
13	1041SB004 (0	4288417		8.51		3217615		11.34		1949785		12.67	
14	1034SB001 (0	4476908		8.51		3338465		11.34		2081656		12.67	
15	1034SB008 (0	3811468		8.51		2206471		11.34		1092659	*	12.67	
16													
17													
18													
19													
20													
21													
22													

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

PCB SECTION

ORGANIC CASE NARRATIVE - PCBs
Arcadis – Radford001

Date Sampled	Date Received	Lab ID	Client ID	TAT/SDG
05/07/08	05/08/08	0805074-04	1549SB003(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-05	1549SB001(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-06	1549SB001(7-8)	Radford003
05/07/08	05/08/08	0805074-07	1549DUP002(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-08	1549SB004(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-09	1549SB004(5-6)	Radford003
05/07/08	05/08/08	0805074-10	1549SB006(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-11	1549SB006(5-6)	Radford003
05/07/08	05/08/08	0805074-12	1549SB003(5-6)	Radford003
05/07/08	05/08/08	0805074-13	TB2(05072008-01)	X
05/08/08	05/09/08	0805095-01	1034SB004 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-02	1034SB004 (5-6)	Radford003
05/08/08	05/09/08	0805095-03	1041SB002 (1-2)	4BD
05/08/08	05/09/08	0805095-04	1041SB002 (7-8)	Radford003
05/08/08	05/09/08	0805095-05	1041HP002 (05062008)	X
05/08/08	05/09/08	0805095-07	1041SB004 (0-1)	4BD
05/08/08	05/09/08	0805095-08	1041SB004 (7-8)	Radford003
05/08/08	05/09/08	0805095-09	1034SB001 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-10	1034SB001 (7-8)	Radford003
05/08/08	05/09/08	0805095-11	1034SB008 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-12	1034SB008 (4-5)	Radford003

Method: The samples were extracted/analyzed by USEPA SW-846 Methods 3541/8082 or 3510C/8082 (automated soxhlet or separatory funnel extraction followed by dual capillary column GC/ECD) for soils or waters upon receipt to the laboratory in satisfactory condition.

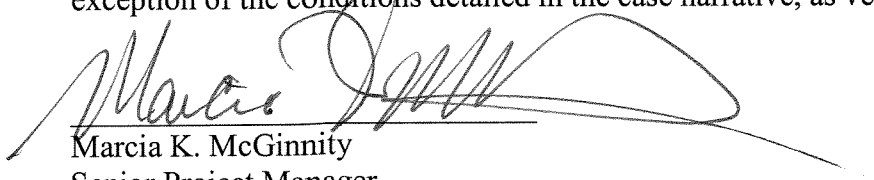
Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction was requested 5/19/08 for samples reflected as SDG Radford003 but analysis is still pending request from the client. E-mail instructions are attached.
- DFTPP Tuning: All method tuning criteria were met.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded as indicated in the following clarifications:
- ECD4 RTX-CLP2 PCB-1254 CCV analyzed 5/16/08 at 23:35 exceeded 20% difference with a negative bias at 20.8%. In the ending CCVs analyzed 5/17/08 at 05:24 and 05:45, DCB, PCB-1254 and PCB-1260 exceeded with a negative bias at 28.3%, 25.1% and 24.7%, respectively. Results are non-detect, less than the quantitation limits or reported from the RTX-CLP column. On the RTX-CLP column, only the DCB exceeded limits with a negative bias at 21.8% in the 05:24 CCV. Surrogate recoveries were evaluated and determined not to have been biased into control by the exceedences.
- ECD4 DCB and PCB-1260 CCVs analyzed 5/18/08 at 06:43 exceeded 20% difference with a positive bias at 19%/30.5% on the RTX-CLP column and 31.6%/17.1% on the RTX-CLP2 column. Results in the associated sample are non-detect. Surrogate recoveries were evaluated and determined not to have been biased into control by the exceedences.
- Blank Results: No target analytes were detected in the method blanks.
- Surrogate Recoveries: Recovery of the surrogate DCB exceeded the limit of 140% at 143% in the RTX-CLP2 column analysis of spike sample PS1BLK0512LCS. Recovery of the

surrogate TCMX exceeded the limit of 120% at 315% in the RTX-CLP column analysis of sample 1041HP002 (05062008). All other recoveries were within limits.

- LCS(/LCSD) Results: All recoveries (and relative percent differences) were within limits.
- 1034SB008(0.5-1.5)MS/MSD results: All recoveries and relative percent differences were within limits.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.



Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

Analyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

Extract and hold all of the other "HOLD" samples.

I am waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
Jane

Jane Kennedy
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From: Sharpe, Christopher
Sent: Friday, May 16, 2008 2:50 PM
To: Kennedy, Jane
Cc: Llewellyn, Tim; Quinnan, Joseph; Wisbeck, Diane; Powell, Jace'que
Subject: RE: using 12 samples

I just got off of the phone with Joe Q re these samples.
Lets analyze the soil samples from 5DitchSB003 and 5DitchSB004 for VOCs only and discard the soil samples from 5DitchSB001 and 5ditchSB002

Tim and Diane agree that the potential cost savings for extract and hold on the 12 samples referenced below makes sense so let's do that as well.

CTS

From: Kennedy, Jane
Sent: Friday, May 16, 2008 1:54 PM
To: Sharpe, Christopher
Subject: using 12 samples

$1804.80 to extract and hold the 12 for SVOCs, PCBs, Explosives

VOCs are $1782 if we analyze the 12 remaining

Jane Kennedy
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ARCADIS US, Inc.
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Suite 1600
Metairie, LA 70002

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 032F3201

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/07/08 10:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 01:17

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.4	22		U
11104-28-2	PCB-1221	5.4	22		U
11141-16-5	PCB-1232	5.4	22		U
53469-21-9	PCB-1242	5.4	22		U
12672-29-6	PCB-1248	5.4	22		U
11097-69-1	PCB-1254	5.4	22		U
11096-82-5	PCB-1260	5.4	22		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB001 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 033F3301

% Moisture: 24 decanted: (Y/N) N Date Sampled: 05/07/08 10:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 01:38

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.5	22		U
11104-28-2	PCB-1221	5.5	22		U
11141-16-5	PCB-1232	5.5	22		U
53469-21-9	PCB-1242	5.5	22		U
12672-29-6	PCB-1248	5.5	22		U
11097-69-1	PCB-1254	5.5	22	93	(1)
11096-82-5	PCB-1260	5.5	22		U

(1) = THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLOR IN THE SAMPLE WAS IDENTIFIED AS THE AROCLOR IT MOST CLOSELY MATCHED.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549DUP00
2(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 034F3401

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 01:59

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.3	21		U
11104-28-2	PCB-1221	5.3	21		U
11141-16-5	PCB-1232	5.3	21		U
53469-21-9	PCB-1242	5.3	21		U
12672-29-6	PCB-1248	5.3	21		U
11097-69-1	PCB-1254	5.3	21	95	(1)
11096-82-5	PCB-1260	5.3	21	160	(1)

(1) = DUE TO THE PRESENCE OF MULTIPLE AROCLORS, THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLORS IN THE SAMPLE WERE IDENTIFIED AS THE AROCLORS THAT MOST CLOSELY MATCHED. THE AROCLORS MAY BE BIASED HIGH TO DUE TO THE PRESENCE OF MULTIPLE AROCLORS.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 035F3501

% Moisture: 17 decanted: (Y/N) N Date Sampled: 05/07/08 11:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 02:19

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.0	20		U
11104-28-2	PCB-1221	5.0	20		U
11141-16-5	PCB-1232	5.0	20		U
53469-21-9	PCB-1242	5.0	20		U
12672-29-6	PCB-1248	5.0	20		U
11097-69-1	PCB-1254	5.0	20		U
11096-82-5	PCB-1260	5.0	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 036F3601

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/07/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 02:40

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.2	21		U
11104-28-2	PCB-1221	5.2	21		U
11141-16-5	PCB-1232	5.2	21		U
53469-21-9	PCB-1242	5.2	21		U
12672-29-6	PCB-1248	5.2	21		U
11097-69-1	PCB-1254	5.2	21		U
11096-82-5	PCB-1260	5.2	21		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 037F3701

% Moisture: 43 decanted: (Y/N) N Date Sampled: 05/08/08 18:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 03:00

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	7.3	29		U
11104-28-2	PCB-1221	7.3	29		U
11141-16-5	PCB-1232	7.3	29		U
53469-21-9	PCB-1242	7.3	29		U
12672-29-6	PCB-1248	7.3	29		U
11097-69-1	PCB-1254	7.3	29		U
11096-82-5	PCB-1260	7.3	29		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

10341SB0
02 (1-2)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 038F3801

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 19:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 03:21

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.4	22		U
11104-28-2	PCB-1221	5.4	22		U
11141-16-5	PCB-1232	5.4	22		U
53469-21-9	PCB-1242	5.4	22		U
12672-29-6	PCB-1248	5.4	22		U
11097-69-1	PCB-1254	5.4	22	33	(1)
11096-82-5	PCB-1260	5.4	22	28	(1)

(1) = DUE TO THE PRESENCE OF MULTIPLE AROCLORS, THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLORS IN THE SAMPLE WERE IDENTIFIED AS THE AROCLORS THAT MOST CLOSELY MATCHED. THE AROCLORS MAY BE BIASED HIGH TO DUE TO THE PRESENCE OF MULTIPLE AROCLORS.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 039F3901

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 13:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 03:41

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.4	22		U
11104-28-2	PCB-1221	5.4	22		U
11141-16-5	PCB-1232	5.4	22		U
53469-21-9	PCB-1242	5.4	22		U
12672-29-6	PCB-1248	5.4	22		U
11097-69-1	PCB-1254	5.4	22	210	(1)
11096-82-5	PCB-1260	5.4	22	92	(1)

(1) = DUE TO THE PRESENCE OF MULTIPLE AROCLORS, THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLORS IN THE SAMPLE WERE IDENTIFIED AS THE AROCLORS THAT MOST CLOSELY MATCHED. THE AROCLORS MAY BE BIASED HIGH TO DUE TO THE PRESENCE OF MULTIPLE AROCLORS.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP002
(05062008

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: 0805095-05

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 045F4501

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/08/08 11:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/19/08 04:39

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.53		U
11104-28-2	PCB-1221	0.12	0.53		U
11141-16-5	PCB-1232	0.12	0.53		U
53469-21-9	PCB-1242	0.12	0.53		U
12672-29-6	PCB-1248	0.12	0.53		U
11097-69-1	PCB-1254	0.12	0.53		U
11096-82-5	PCB-1260	0.12	0.53		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 040F4001

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/08/08 14:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 04:02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.2	21		U
11104-28-2	PCB-1221	5.2	21		U
11141-16-5	PCB-1232	5.2	21		U
53469-21-9	PCB-1242	5.2	21		U
12672-29-6	PCB-1248	5.2	21		U
11097-69-1	PCB-1254	5.2	21		U
11096-82-5	PCB-1260	5.2	21	64	(1)

(1) = THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLOR IN THE SAMPLE WAS IDENTIFIED AS THE AROCLOR IT MOST CLOSELY MATCHED.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 041F4101

% Moisture: 16 decanted: (Y/N) N Date Sampled: 05/08/08 15:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 04:23

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.0	20		U
11104-28-2	PCB-1221	5.0	20		U
11141-16-5	PCB-1232	5.0	20		U
53469-21-9	PCB-1242	5.0	20		U
12672-29-6	PCB-1248	5.0	20		U
11097-69-1	PCB-1254	5.0	20		U
11096-82-5	PCB-1260	5.0	20	12	J(1)

(1) = THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLOR IN THE SAMPLE WAS IDENTIFIED AS THE AROCLOR IT MOST CLOSELY MATCHED.

FORM 2
SOIL PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Column(1): RTX-CLP ID: 0.32 (mm) Column(2): RTX-CLPII ID: 0.32 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PS1BLK0512	102	102	111	112			0
02	PS1BLK0512LC	113	105	137	143*			1
03	1549SB003(0.	108	111	89	86			0
04	1549SB001(0.	118	111	94	88			0
05	1549DUP002(0	114	112	98	93			0
06	1549SB004(0.	98	96	85	82			0
07	1549SB006(0.	96	96	89	89			0
08	1034SB004 (0	77	78	101	101			0
09	10341SB002 (	110	111	109	108			0
10	1041SB004 (0	84	82	101	98			0
11	1034SB001 (0	107	105	82	70			0
12	1034SB008 (0	95	88	76	59			0
13	1034SB008 (0	111	102	80	62			0
14	1034SB008 (0	104	96	73	56			0
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		EL QC LIMITS	SPIKE CONC (ug/Kg)
S1	= TCMX	(30-120)	17
S2	= DCB	(35-140)	17

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 2
WATER PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Column(1): RTX-CLP ID: 0.32 (mm) Column(2): RTX-CLPII ID: 0.32 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PW2BLK0514	91	92	77	85			0
02	PW2BLK0514LC	111	89	80	85			0
03	PW2BLK0514LC	95	95	86	93			0
04	1041HP002 (0	315*	91	59	65			1
05								
06								
07								
08								
09								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		EL QC LIMITS	SPIKE CONC (ug/L)
S1	= TCMX	(25-120)	0.50
S2	= DCB	(25-130)	0.50

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: PS1BLK0512

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PCB-1016	166.7	0.0000	199.1	119	45-120
PCB-1260	166.7	0.0000	181.4	109	40-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 2 outside limits

COMMENTS: _____

FORM 3
WATER PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix Spike - Client Sample No.: PW2BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
PCB-1016	5.000	0.0000	4.949	99	30-140
PCB-1260	5.000	0.0000	4.085	82	40-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	5.000	5.418	108	9	30	30-140
PCB-1260	5.000	4.639	93	13	30	40-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 3
SOIL PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix Spike -Client Sample No.:1034SB008 (0.5-1.5) Lab Sample ID: 0805095-11

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
PCB-1016	199.4	0.0000	216.1	108	45-120
PCB-1260	199.4	11.86	140.4	64	40-125

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	199.4	201.0	101	7	50	45-120
PCB-1260	199.4	130.1	59	8	50	40-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PS1BLK0512

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Lab Sample ID: PS1BLK0512 Lab File ID: 030F3001

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SOXH

Sulfur Cleanup (Y/N) Y Date Extracted: 05/12/08

Date Analyzed (1): 05/17/08 Date Analyzed (2): 05/17/08

Time Analyzed (1): 0036 Time Analyzed (2): 0036

Instrument ID (1): ECD4 Instrument ID (2): ECD4

Column (1): RTX-CLP ID: 0.32(mm) Column (2): RTX-CLPII ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PS1BLK0512LC	PS1BLK0512LCS	05/17/08	05/17/08
02	1549SB003(0.	0805074-04	05/17/08	05/17/08
03	1549SB001(0.	0805074-05	05/17/08	05/17/08
04	1549DUP002(0	0805074-07	05/17/08	05/17/08
05	1549SB004(0.	0805074-08	05/17/08	05/17/08
06	1549SB006(0.	0805074-10	05/17/08	05/17/08
07	1034SB004 (0	0805095-01	05/17/08	05/17/08
08	10341SB002 (	0805095-03	05/17/08	05/17/08
09	1041SB004 (0	0805095-07	05/17/08	05/17/08
10	1034SB001 (0	0805095-09	05/17/08	05/17/08
11	1034SB008 (0	0805095-11	05/17/08	05/17/08
12	1034SB008 (0	0805095-11MS	05/17/08	05/17/08
13	1034SB008 (0	0805095-11MSD	05/17/08	05/17/08
14				
15				
16				
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COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PS1BLK0512

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) SOIL Lab Sample ID: PS1BLK0512

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 030F3001

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/12/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/17/08 00:36

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.2	17		U
11104-28-2	PCB-1221	4.2	17		U
11141-16-5	PCB-1232	4.2	17		U
53469-21-9	PCB-1242	4.2	17		U
12672-29-6	PCB-1248	4.2	17		U
11097-69-1	PCB-1254	4.2	17		U
11096-82-5	PCB-1260	4.2	17		U

FORM 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PW2BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Lab Sample ID: PW2BLK0514 Lab File ID: 042F4201

Matrix (soil/water) WATER Extraction: (SepF/Cont/Sonc/Soxh) SEPF

Sulfur Cleanup (Y/N) Y Date Extracted: 05/14/08

Date Analyzed (1): 05/19/08 Date Analyzed (2): 05/19/08

Time Analyzed (1): 0337 Time Analyzed (2): 0337

Instrument ID (1): ECD4 Instrument ID (2): ECD4

Column (1): RTX-CLP ID: 0.32(mm) Column (2): RTX-CLPII ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PW2BLK0514LC	PW2BLK0514LCS	05/19/08	05/19/08
02	PW2BLK0514LC	PW2BLK0514LCSD	05/19/08	05/19/08
03	1041HP002 (0	0805095-05	05/19/08	05/19/08
04				
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COMMENTS: _____

FORM IV PCB

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW2BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD001

Matrix: (soil/water) WATER Lab Sample ID: PW2BLK0514

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 042F4201

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/19/08 03:37

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.50		U
11104-28-2	PCB-1221	0.12	0.50		U
11141-16-5	PCB-1232	0.12	0.50		U
53469-21-9	PCB-1242	0.12	0.50		U
12672-29-6	PCB-1248	0.12	0.50		U
11097-69-1	PCB-1254	0.12	0.50		U
11096-82-5	PCB-1260	0.12	0.50		U

EXPLOSIVES SECTION

ORGANIC CASE NARRATIVE - Explosives
Arcadis - Radford001

Date Sampled	Date Received	Lab ID	Client ID	TAT/SDG
05/07/08	05/08/08	0805074-04	1549SB003(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-05	1549SB001(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-06	1549SB001(7-8)	Radford003
05/07/08	05/08/08	0805074-07	1549DUP002(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-08	1549SB004(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-09	1549SB004(5-6)	Radford003
05/07/08	05/08/08	0805074-10	1549SB006(0.5-1.5)	4BD
05/07/08	05/08/08	0805074-11	1549SB006(5-6)	Radford003
05/07/08	05/08/08	0805074-12	1549SB003(5-6)	Radford003
05/07/08	05/08/08	0805074-13	TB2(05072008-01)	X
05/08/08	05/09/08	0805095-01	1034SB004 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-02	1034SB004 (5-6)	Radford003
05/08/08	05/09/08	0805095-03	1041SB002 (1-2)	4BD
05/08/08	05/09/08	0805095-04	1041SB002 (7-8)	Radford003
05/08/08	05/09/08	0805095-05	1041HP002 (05062008)	X
05/08/08	05/09/08	0805095-07	1041SB004 (0-1)	4BD
05/08/08	05/09/08	0805095-08	1041SB004 (7-8)	Radford003
05/08/08	05/09/08	0805095-09	1034SB001 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-10	1034SB001 (7-8)	Radford003
05/08/08	05/09/08	0805095-11	1034SB008 (0.5-1.5)	4BD
05/08/08	05/09/08	0805095-12	1034SB008 (4-5)	Radford003

Method: The samples were extracted/analyzed for client specified analyte lists by USEPA SW-846 Method 8330A (solid phase or shaker extraction followed by packed column HPLC) for waters or soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction was requested 5/19/08 for samples reflected as SDG Radford003 but analysis is still pending request from the client. E-mail instructions are attached.
- Calibration Criteria: All target analytes required for the analyses were within 15% difference or the continuing calibration verification met an average of 15% difference with no individual target exceeding 30% difference.
- Method Blank Results: No target analytes were detected in the associated method blanks.
- Surrogate Recoveries: All recoveries were within limits with the exception of the confirmation of sample 1549SB001(0.5-1.5) where the surrogate exceeded 140% at 148%. No target analytes were confirmed.
- LCS(/LCSD) results: All recoveries (and relative percent differences) were within limits.
- MS/MSD results: Not applicable.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

Analyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

Extract and hold all of the other "HOLD" samples.

I am waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
Jane

Jane Kennedy
Principle Scientist
ARCADIS US, Inc.
3850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002
Phone: (504) 832-4174 Ext 106
Cell: (225) 205-8256
E-mail: jane.kennedy@arcadis-us.com

From: Sharpe, Christopher
Sent: Friday, May 16, 2008 2:50 PM
To: Kennedy, Jane
Cc: Llewellyn, Tim; Quinnan, Joseph; Wisbeck, Diane; Powell, Jace'que
Subject: RE: using 12 samples

I just got off of the phone with Joe Q re these samples.
Lets analyze the soil samples from 5DitchSB003 and 5DitchSB004 for VOCs only and discard the soil samples from 5DitchSB001 and 5ditchSB002

Tim and Diane agree that the potential cost savings for extract and hold on the 12 samples referenced below makes sense so let's do that as well.

CTS

From: Kennedy, Jane
Sent: Friday, May 16, 2008 1:54 PM
To: Sharpe, Christopher
Subject: using 12 samples

$1804.80 to extract and hold the 12 for SVOCs, PCBs, Explosives

VOCs are $1782 if we analyze the 12 remaining

Jane Kennedy
Principle Scientist
ARCADIS US, Inc.
3850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05074

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-04

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 020V2001

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 10:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 01:31

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05074

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-05

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 021V2101

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 10:40

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 02:01

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549DUP00
2(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05074

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-07

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 022V2201

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 02:32

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0	2.5	J
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05074

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-08

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 023V2301

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 11:45

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 03:02

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05074

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-10

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 024V2401

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 03:32

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-01

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 025V2501

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 18:30

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 04:03

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

10341SB0
02 (1-2)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-03

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 026V2601

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 19:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 04:33

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP002
(05062008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) WATER Lab Sample ID: 0805095-05

Sample wt/vol: 900.0 (g/ml) ML Lab File ID: 052V5201

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/08/08 11:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/14/08 17:15

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.089	0.22		U
121-82-4	RDX	0.089	0.22		U
98-95-3	Nitrobenzene	0.098	0.22		U
99-65-0	1,3-Dinitrobenzene	0.089	0.22		U
99-35-4	1,3,5-Trinitrobenzene	0.089	0.22		U
121-14-2	2,4-Dinitrotoluene	0.12	0.22		U
606-20-2	2,6-Dinitrotoluene	0.12	0.22		U
118-96-7	2,4,6-Trinitrotoluene	0.089	0.22		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	0.22		U
479-45-8	Tetryl	0.089	0.22		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.089	0.22		U
88-72-2	2-Nitrotoluene	0.089	0.22		U
99-99-0	4-Nitrotoluene	0.089	0.22		U
99-08-1	3-Nitrotoluene	0.13	0.22		U
55-63-0	Nitroglycerin	1.4	4.4		U
78-11-5	PETN	1.4	4.4		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-07

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 027V2701

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 13:50

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 05:03

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-09

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 028V2801

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 14:30

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 05:34

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-11

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 029V2901

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 15:20

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/14/08 06:04

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 2
SOIL EXPL SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05074

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	S3 1 %REC #	S3 2 %REC #	TOT OUT
01	ES1BLK0512	109	120					0
02	ES1BLK0512LC	105						0
03	ES1BLK0512LC	103						0
04	ES1BLK0512LC	108						0
05	1549SB003(0.	111	122					0
06	1549SB001(0.	140	148*					1
07	1549DUP002(0	111	125					0
08	1549SB004(0.	130	135					0
09	1549SB006(0.	112	123					0
10	1549SB001(0.		122					0
07	1549DUP002(0		109					0
08	1549SB004(0.		110					0
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		EL QC LIMITS	SPIKE CONC (mg/Kg)
S1	= 1,2-Dinitrobenzene	(55-140)	0.20

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 2
SOIL EXPL SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC	S1 1 #	S1 2 %REC	S1 2 #	S2 1 %REC	S2 1 #	S2 2 %REC	S2 2 #	S3 1 %REC	S3 1 #	S3 2 %REC	S3 2 #	TOT OUT
01	ES1BLK0512	109		120										0
02	ES1BLK0512LC	105												0
03	ES1BLK0512LC	103												0
04	ES1BLK0512LC	108												0
05	1034SB004 (0	111		109										0
06	10341SB002 (	116		122										0
07	1041SB004 (0	108		117										0
08	1034SB001 (0	111		130										0
09	1034SB008 (0	128		122										0
10														
11														
12														
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27														
28														
29														
30														

		EL QC LIMITS	SPIKE CONC (mg/Kg)
S1	= 1,2-Dinitrobenzene	(55-140)	0.20

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 2
WATER EXPL SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC	#	S1 2 %REC	#	S2 1 %REC	#	S2 2 %REC	#	S3 1 %REC	#	S3 2 %REC	#	TOT OUT
01	EW1BLK0514	88		100										0
02	EW1BLK0514LC	89												0
03	EW1BLK0514LC	94												0
04	1041HP002 (0	89		100										0
05														
06														
07														
08														
09														
10														
11														
12														
13														
14														
15														
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26														
27														
28														
29														
30														

		EL QC LIMITS	SPIKE CONC (ug/L)
S1	= 1,2-Dinitrobenzene	(40-145)	2.0

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix Spike - Client Sample No.: ES1BLK0512

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	1.000	0.0000	1.046	105	75-140
RDX	1.000	0.0000	1.080	108	80-120
Nitrobenzene	1.000	0.0000	1.094	109	20-145
1,3-Dinitrobenzene	1.000	0.0000	1.088	109	85-130
1,3,5-Trinitrobenzene	1.000	0.0000	1.088	109	70-120
2,4-Dinitrotoluene	1.000	0.0000	0.9927	99	75-130
2,6-Dinitrotoluene	1.000	0.0000	1.033	103	65-130
2,4,6-Trinitrotoluene	1.000	0.0000	0.9817	98	45-140
2-Amino-4,6-dinitrotolu	1.000	0.0000	1.067	107	60-125
Tetryl	1.000	0.0000	1.033	103	55-150
4-Amino-2,6-dinitrotolu	1.000	0.0000	0.9654	96	30-175
2-Nitrotoluene	1.000	0.0000	1.044	104	65-130
4-Nitrotoluene	1.000	0.0000	1.098	110	65-130
3-Nitrotoluene	1.000	0.0000	1.086	109	65-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix Spike - Client Sample No.: ES1BLK0512

COMPOUND	SPIKE ADDED (mg/Kg)	LCSD CONCENTRATION (mg/Kg)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	1.000	1.020	102	2	50	75-140
RDX	1.000	1.059	106	2	50	80-120
Nitrobenzene	1.000	1.082	108	1	50	20-145
1,3-Dinitrobenzene	1.000	1.071	107	2	50	85-130
1,3,5-Trinitrobenzene	1.000	1.065	106	2	50	70-120
2,4-Dinitrotoluene	1.000	0.9758	98	2	50	75-130
2,6-Dinitrotoluene	1.000	1.012	101	2	50	65-130
2,4,6-Trinitrotoluene	1.000	0.9624	96	2	50	45-140
2-Amino-4,6-dinitrotolu	1.000	1.048	105	2	50	60-125
Tetryl	1.000	1.001	100	3	50	55-150
4-Amino-2,6-dinitrotolu	1.000	0.9444	94	2	50	30-175
2-Nitrotoluene	1.000	1.036	104	1	50	65-130
4-Nitrotoluene	1.000	1.078	108	2	50	65-130
3-Nitrotoluene	1.000	1.065	106	2	50	65-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 0 out of 28 outside limits

COMMENTS: _____

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix Spike - Client Sample No.: ES1BLK0512LCSN

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC #	QC. LIMITS REC.
Nitroglycerin	10.00	0.0000	10.06	101	60-120
PETN	10.00	0.0000	10.94	109	60-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 2 outside limits

COMMENTS: _____

FORM 3
WATER EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix Spike - Client Sample No.: EW1BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
HMX	10.00	0.0000	9.370	94	55-140
RDX	10.00	0.0000	9.680	97	60-145
Nitrobenzene	10.00	0.0000	9.569	96	35-130
1,3-Dinitrobenzene	10.00	0.0000	9.501	95	65-145
1,3,5-Trinitrobenzene	10.00	0.0000	9.776	98	55-125
2,4-Dinitrotoluene	10.00	0.0000	8.880	89	60-140
2,6-Dinitrotoluene	10.00	0.0000	9.169	92	60-130
2,4,6-Trinitrotoluene	10.00	0.0000	8.788	88	60-130
2-Amino-4,6-dinitrotolu	10.00	0.0000	9.137	91	60-135
Tetryl	10.00	0.0000	9.321	93	10-170
4-Amino-2,6-dinitrotolu	10.00	0.0000	8.548	85	55-140
2-Nitrotoluene	10.00	0.0000	8.649	86	35-135
4-Nitrotoluene	10.00	0.0000	8.923	89	55-130
3-Nitrotoluene	10.00	0.0000	8.814	88	45-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 14 outside limits

COMMENTS: _____

FORM 3
WATER EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix Spike - Client Sample No.: EW1BLK0514LCSN

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Nitroglycerin	100.0	0.0000	93.25	93	60-120
PETN	100.0	0.0000	87.01	87	60-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 2 outside limits

COMMENTS: _____

FORM 4
EXPL METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

ES1BLK0512

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05074

Lab Sample ID: ES1BLK0512 Lab File ID: 016V1601

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SONC

Sulfur Cleanup (Y/N) N Date Extracted: 05/12/08

Date Analyzed (1): 05/13/08 Date Analyzed (2): 05/14/08

Time Analyzed (1): 2335 Time Analyzed (2): 1908

Instrument ID (1): HPLC2 Instrument ID (2): HPLC1

Column (1): ULTRA C-18 ID: 4.60(mm) Column (2): SYNERGI POLAR-RP ID: 4.60(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	ES1BLK0512LC	ES1BLK0512LCS	05/14/08	
02	ES1BLK0512LC	ES1BLK0512LCSD	05/14/08	
03	ES1BLK0512LC	ES1BLK0512LCSN	05/14/08	
04	1549SB003(0.	0805074-04	05/14/08	05/14/08
05	1549SB001(0.	0805074-05	05/14/08	05/14/08
06	1549DUP002(0	0805074-07	05/14/08	05/14/08
07	1549SB004(0.	0805074-08	05/14/08	05/15/08
08	1549SB006(0.	0805074-10	05/14/08	05/14/08
09	1549SB001(0.	0805074-05		05/16/08
06	1549DUP002(0	0805074-07		05/16/08
07	1549SB004(0.	0805074-08		05/16/08
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

COMMENTS: _____

FORM 4
EXPL METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

ES1BLK0512

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Lab Sample ID: ES1BLK0512 Lab File ID: 016V1601

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SONC

Sulfur Cleanup (Y/N) N Date Extracted: 05/12/08

Date Analyzed (1): 05/13/08 Date Analyzed (2): 05/14/08

Time Analyzed (1): 2335 Time Analyzed (2): 1908

Instrument ID (1): HPLC2 Instrument ID (2): HPLC1

Column (1): ULTRA C-18 ID: 4.60(mm) Column (2): SYNERGI POLAR-RP ID: 4.60(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	ES1BLK0512LC	ES1BLK0512LCS	05/14/08	
02	ES1BLK0512LC	ES1BLK0512LCSD	05/14/08	
03	ES1BLK0512LC	ES1BLK0512LCSN	05/14/08	
04	1034SB004 (0	0805095-01	05/14/08	05/14/08
05	10341SB002 (	0805095-03	05/14/08	05/15/08
06	1041SB004 (0	0805095-07	05/14/08	05/15/08
07	1034SB001 (0	0805095-09	05/14/08	05/15/08
08	1034SB008 (0	0805095-11	05/14/08	05/15/08
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

COMMENTS: _____

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ES1BLK0512

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) SOIL Lab Sample ID: ES1BLK0512

Sample wt/vol: 10.0 (g/mL) G Lab File ID: 016V1601

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/12/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/13/08 23:35

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 4
EXPL METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

EW1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Lab Sample ID: EW1BLK0514 Lab File ID: 049V4901

Matrix (soil/water) WATER Extraction: (SepF/Cont/Sonc/Soxh) SEPF

Sulfur Cleanup (Y/N) N Date Extracted: 05/14/08

Date Analyzed (1): 05/14/08 Date Analyzed (2): 05/14/08

Time Analyzed (1): 1546 Time Analyzed (2): 1733

Instrument ID (1): HPLC2 Instrument ID (2): HPLC1

Column (1): ULTRA C-18 ID: 4.60(mm) Column (2): SYNERGI POLAR-RP ID: 4.60(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	EW1BLK0514LC	EW1BLK0514LCS	05/14/08	
02	EW1BLK0514LC	EW1BLK0514LCSN	05/14/08	
03	1041HP002 (0	0805095-05	05/14/08	05/14/08
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

COMMENTS: _____

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EW1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.E05095

Matrix: (soil/water) WATER Lab Sample ID: EW1BLK0514

Sample wt/vol: 1000 (g/ml) ML Lab File ID: 049V4901

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/14/08 15:46

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.080	0.20		U
121-82-4	RDX	0.080	0.20		U
98-95-3	Nitrobenzene	0.088	0.20		U
99-65-0	1,3-Dinitrobenzene	0.080	0.20		U
99-35-4	1,3,5-Trinitrobenzene	0.080	0.20		U
121-14-2	2,4-Dinitrotoluene	0.10	0.20		U
606-20-2	2,6-Dinitrotoluene	0.10	0.20		U
118-96-7	2,4,6-Trinitrotoluene	0.080	0.20		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	0.20		U
479-45-8	Tetryl	0.080	0.20		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.080	0.20		U
88-72-2	2-Nitrotoluene	0.080	0.20		U
99-99-0	4-Nitrotoluene	0.080	0.20		U
99-08-1	3-Nitrotoluene	0.12	0.20		U
55-63-0	Nitroglycerin	1.3	4.0		U
78-11-5	PETN	1.3	4.0		U

INORGANIC SECTION

INORGANIC CASE NARRATIVE
Arcadis
SDG# Radford001
Work Order# 0805074, 0805095
May, 2008

Empirical Laboratories ID	Client ID
0805074-04	1549SB003(0.5-1.5)
0805074-05	1549SB001(0.5-1.5)
0805074-07	1549DUP002(0.5-1.5)
0805074-08	1549SB004(0.5-1.5)
0805074-10	1549SB006(0.5-1.5)
0805095-01	1034SB004 (0.5-1.5)
0805095-03	10341SB002 (1-2)
0805095-05	1041HP002 (05062008)
0805095-07	1041SB004 (0-1)
0805095-09	1034SB001 (0.5-1.5)
0805095-11	1034SB008 (0.5-1.5)

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Betty DeVille
Inorganic Lab Manager

Methods:

The samples were digested for ICAP metals using USEPA SW846 method 3005A for the water sample and 3050B for the soil samples and analyzed by 6010B. Mercury was digested and analyzed by 7470A for the water sample and 7471A for the soil samples. Note: The "U" flag on the forms indicates that the analyte is reported down to the MDL. The "B" flag indicates that the analyte result is between the CRDL and the laboratory MDL.

Specific Comments:

All analyses performed by the Inorganic section were completed meeting satisfactorily the corresponding specifications for Quality Control with the following exceptions:

I. ICAP Metals

A. Matrix Spike and Matrix Spike Duplicate (MS/MSD) Specification Limits (75 to 125%)

1. The matrix spike and/or the matrix spike duplicate were out of the specification limits for antimony at 12.8 and 11.7%, for magnesium at -

98.0%, for manganese at 55.1 and 172.1%, for mercury at 65.6 and 29.9% and for silver at 202.3% on sample 1034SB008 (0.5-1.5). The post digestion spike recovery was at 100.0% for antimony, 98.7% for magnesium, 105.5% for manganese and 106.8% for silver. **All associated data is flagged with an "N" on the final report.**

B. Relative Percent Difference (RPD) Specification Limits (20%)

1. The relative percent difference between the matrix spike and the matrix spike duplicate was out of the specification limits for calcium at 80%, for magnesium at 50.1%, for manganese at 29.4%, for mercury at 23.0% and for silver at 69.2% for sample 1034SB008 (0.5-1.5). **All associated data are flagged with an (*) on the final report.**

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0805074-04	1549SB003(0.5-1.5)	Solid	05/07/08 10:00:00 AM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805074-05	1549SB001(0.5-1.5)	Solid	05/07/08 10:40:00 AM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805074-05	1549SB001(0.5-1.5)	Solid	05/07/08 10:40:00 AM	Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805074-07	1549DUP002(0.5-1.5)	Solid	05/07/08 12:00:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805074-08	1549SB004(0.5-1.5)	Solid	05/07/08 11:45:00 AM	% Solids
				Aluminum
				Antimony

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805074-08	1549SB004(0.5-1.5)	Solid	05/07/08 11:45:00 AM	Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805074-10	1549SB006(0.5-1.5)	Solid	05/07/08 12:15:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805074-10	1549SB006(0.5-1.5)	Solid	05/07/08 12:15:00 PM	Silver
				Sodium
				Thallium
				Vanadium
				Zinc

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0805095-01	1034SB004 (0.5-1.5)	Solid	05/08/08 6:30:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-03	10341SB002 (1-2)	Solid	05/08/08 7:00:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805095-03	10341SB002 (1-2)	Solid	05/08/08 7:00:00 PM	Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-05	1041HP002 (05062008)	Ground Water	05/08/08 11:00:00 AM	Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-07	1041SB004 (0-1)	Solid	05/08/08 1:50:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic

Lab Sample ID	Field ID	Matrix	Date _Time Sampled	Parameters requested
0805095-07	1041SB004 (0-1)	Solid	05/08/08 1:50:00 PM	Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-09	1034SB001 (0.5-1.5)	Solid	05/08/08 2:30:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805095-09	1034SB001 (0.5-1.5)	Solid	05/08/08 2:30:00 PM	Sodium
				Thallium
				Vanadium
				Zinc
0805095-11	1034SB008 (0.5-1.5)	Solid	05/08/08 3:20:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

OW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
1549SB003(0.5-1.5)	0805074-04
1549SB001(0.5-1.5)	0805074-05
1549DUP002(0.5-1.5)	0805074-07
1549SB004(0.5-1.5)	0805074-08
1549SB006(0.5-1.5)	0805074-10
1034SB004 (0.5-1.5)	0805095-01
10341SB002 (1-2)	0805095-03
1041HP002 (05062008)	0805095-05
1041SB004 (0-1)	0805095-07
1034SB001 (0.5-1.5)	0805095-09
1034SB008 (0.5-1.5)	0805095-11
1034SB008 (0.5-1.5)S	0805095-11S
1034SB008 (0.5-1.5)SD	0805095-11SD

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: D. Rick Davis

Date: _____ Title: Vice-President

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB003(0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805074-04

Level (low/med): LOW Date Received: 05/08/08

% Solids: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	33000			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	4.7			P
7440-39-3	Barium	80.6			P
7440-41-7	Beryllium	1.0	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	6620		*	P
7440-47-3	Chromium	33.8			P
7440-48-4	Cobalt	8.4			P
7440-50-8	Copper	17.2			P
7439-89-6	Iron	35100			P
7439-92-1	Lead	15.4			P
7439-95-4	Magnesium	6480		N*	P
7439-96-5	Manganese	347		N*	P
7439-97-6	Mercury	0.061			AV
7440-02-0	Nickel	15.4			P
7440-09-7	Potassium	1680			P
7782-49-2	Selenium	0.76	U		P
7440-22-4	Silver	0.26	U	N*	P
7440-23-5	Sodium	255	U		P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	65.6			P
7440-66-6	Zinc	37.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB001(0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805074-05

Level (low/med): LOW Date Received: 05/08/08

% Solids: 76.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	35400			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	6.7			P
7440-39-3	Barium	70.1			P
7440-41-7	Beryllium	1.7			P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	3550		*	P
7440-47-3	Chromium	35.3			P
7440-48-4	Cobalt	11.8			P
7440-50-8	Copper	23.3			P
7439-89-6	Iron	42100			P
7439-92-1	Lead	16.4			P
7439-95-4	Magnesium	5690		N*	P
7439-96-5	Manganese	258		N*	P
7439-97-6	Mercury	0.080			AV
7440-02-0	Nickel	23.2			P
7440-09-7	Potassium	2640			P
7782-49-2	Selenium	0.77	U		P
7440-22-4	Silver	0.26	U	N*	P
7440-23-5	Sodium	258	U		P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	67.5			P
7440-66-6	Zinc	44.1			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549DUP002(0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805074-07

Level (low/med): LOW Date Received: 05/08/08

% Solids: 78.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	40700			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	5.3			P
7440-39-3	Barium	60.3			P
7440-41-7	Beryllium	0.61	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	1140	B	*	P
7440-47-3	Chromium	40.0			P
7440-48-4	Cobalt	3.4	B		P
7440-50-8	Copper	19.5			P
7439-89-6	Iron	53100			P
7439-92-1	Lead	15.0			P
7439-95-4	Magnesium	1180	B	N*	P
7439-96-5	Manganese	143		N*	P
7439-97-6	Mercury	0.13			AV
7440-02-0	Nickel	10.8			P
7440-09-7	Potassium	1030	B		P
7782-49-2	Selenium	0.76	U		P
7440-22-4	Silver	0.25	U	N*	P
7440-23-5	Sodium	275	B		P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	99.5			P
7440-66-6	Zinc	41.7			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB004(0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805074-08

Level (low/med): LOW Date Received: 05/08/08

% Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	26200			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	2.9			P
7440-39-3	Barium	56.9			P
7440-41-7	Beryllium	0.47	B		P
7440-43-9	Cadmium	0.23	U		P
7440-70-2	Calcium	3280		*	P
7440-47-3	Chromium	31.7			P
7440-48-4	Cobalt	6.0			P
7440-50-8	Copper	11.7			P
7439-89-6	Iron	30400			P
7439-92-1	Lead	13.6			P
7439-95-4	Magnesium	2160		N*	P
7439-96-5	Manganese	457		N*	P
7439-97-6	Mercury	0.063			AV
7440-02-0	Nickel	8.3			P
7440-09-7	Potassium	835	B		P
7782-49-2	Selenium	0.88	B		P
7440-22-4	Silver	0.23	U	N*	P
7440-23-5	Sodium	272	B		P
7440-28-0	Thallium	0.70	U		P
7440-62-2	Vanadium	60.5			P
7440-66-6	Zinc	26.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB006(0.5-1.5)

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

atrix (soil/water): SOLID Lab Sample ID: 0805074-10

evel (low/med): LOW Date Received: 05/08/08

Solids: 80.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	27100			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	5.8			P
7440-39-3	Barium	82.9			P
7440-41-7	Beryllium	1.2	B		P
7440-43-9	Cadmium	0.24	U		P
7440-70-2	Calcium	9460		*	P
7440-47-3	Chromium	31.7			P
7440-48-4	Cobalt	9.8			P
7440-50-8	Copper	14.9			P
7439-89-6	Iron	30300			P
7439-92-1	Lead	15.8			P
7439-95-4	Magnesium	8230		N*	P
7439-96-5	Manganese	154		N*	P
7439-97-6	Mercury	0.041	B		AV
7440-02-0	Nickel	16.8			P
7440-09-7	Potassium	1940			P
7782-49-2	Selenium	0.74	U		P
7440-22-4	Silver	0.24	U	N*	P
7440-23-5	Sodium	312	B		P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	55.6			P
7440-66-6	Zinc	39.8			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB004 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805095-01

Level (low/med): LOW Date Received: 05/09/08

% Solids: 57.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	61700			P
7440-36-0	Antimony	1.8	U	N	P
7440-38-2	Arsenic	10.1			P
7440-39-3	Barium	91.4			P
7440-41-7	Beryllium	1.6	B		P
7440-43-9	Cadmium	0.35	U		P
7440-70-2	Calcium	2820		*	P
7440-47-3	Chromium	46.4			P
7440-48-4	Cobalt	10.2			P
7440-50-8	Copper	79.0			P
7439-89-6	Iron	76800			P
7439-92-1	Lead	60.8			P
7439-95-4	Magnesium	2750		N*	P
7439-96-5	Manganese	108		N*	P
7439-97-6	Mercury	0.49		N*	AV
7440-02-0	Nickel	26.1			P
7440-09-7	Potassium	1950			P
7782-49-2	Selenium	1.1	U		P
7440-22-4	Silver	0.35	U	N*	P
7440-23-5	Sodium	351	U		P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	133			P
7440-66-6	Zinc	149			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

10341SB002 (1-2)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805095-03

Level (low/med): LOW Date Received: 05/09/08

% Solids: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	28300			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	3.5			P
7440-39-3	Barium	60.1			P
7440-41-7	Beryllium	0.74	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	6490		*	P
7440-47-3	Chromium	29.0			P
7440-48-4	Cobalt	9.9			P
7440-50-8	Copper	20.2			P
7439-89-6	Iron	37700			P
7439-92-1	Lead	13.3			P
7439-95-4	Magnesium	3450		N*	P
7439-96-5	Manganese	276		N*	P
7439-97-6	Mercury	0.13		N*	AV
7440-02-0	Nickel	12.4			P
7440-09-7	Potassium	1180	B		P
7782-49-2	Selenium	0.78	U		P
7440-22-4	Silver	0.26	U	N*	P
7440-23-5	Sodium	260	U		P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	57.9			P
7440-66-6	Zinc	30.0			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP002 (05062008)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): GROUND WATER Lab Sample ID: 0805095-05

Level (low/med): LOW Date Received: 05/09/08

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2120			P
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	1.0	B		P
7440-39-3	Barium	36.6			P
7440-41-7	Beryllium	0.33	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	17500			P
7440-47-3	Chromium	4.7			P
7440-48-4	Cobalt	3.1	B		P
7440-50-8	Copper	10.8			P
7439-89-6	Iron	6230			P
7439-92-1	Lead	1.1			P
7439-95-4	Magnesium	7740			P
7439-96-5	Manganese	148			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	3.2			P
7440-09-7	Potassium	2530			P
7782-49-2	Selenium	0.75	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	11400			P
7440-28-0	Thallium	0.75	U		P
7440-62-2	Vanadium	6.5	B		P
7440-66-6	Zinc	8.5			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041SB004 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805095-07

Level (low/med): LOW Date Received: 05/09/08

% Solids: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	25300			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	4.1			P
7440-39-3	Barium	87.8			P
7440-41-7	Beryllium	0.82	B		P
7440-43-9	Cadmium	0.27	B		P
7440-70-2	Calcium	1420		*	P
7440-47-3	Chromium	28.1			P
7440-48-4	Cobalt	9.8			P
7440-50-8	Copper	20.4			P
7439-89-6	Iron	42700			P
7439-92-1	Lead	34.9			P
7439-95-4	Magnesium	1480		N*	P
7439-96-5	Manganese	715		N*	P
7439-97-6	Mercury	0.27		N*	AV
7440-02-0	Nickel	11.9			P
7440-09-7	Potassium	1280	B		P
7782-49-2	Selenium	0.78	U		P
7440-22-4	Silver	0.26	U	N*	P
7440-23-5	Sodium	260	U		P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	59.4			P
7440-66-6	Zinc	78.6			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB001 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805095-09

Level (low/med): LOW Date Received: 05/09/08

% Solids: 79.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	33300			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	3.4			P
7440-39-3	Barium	59.4			P
7440-41-7	Beryllium	0.77	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	2440		*	P
7440-47-3	Chromium	37.7			P
7440-48-4	Cobalt	8.2			P
7440-50-8	Copper	20.1			P
7439-89-6	Iron	46800			P
7439-92-1	Lead	14.3			P
7439-95-4	Magnesium	2100		N*	P
7439-96-5	Manganese	214		N*	P
7439-97-6	Mercury	0.045		N*	AV
7440-02-0	Nickel	13.5			P
7440-09-7	Potassium	1270			P
7782-49-2	Selenium	0.76	B		P
7440-22-4	Silver	0.25	U	N*	P
7440-23-5	Sodium	253	U		P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	73.9			P
7440-66-6	Zinc	36.6			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB008 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Lab Sample ID: 0805095-11

Level (low/med): LOW Date Received: 05/09/08

% Solids: 84.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29700			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	4.0			P
7440-39-3	Barium	75.1			P
7440-41-7	Beryllium	0.93	B		P
7440-43-9	Cadmium	0.24	U		P
7440-70-2	Calcium	6100		*	P
7440-47-3	Chromium	36.2			P
7440-48-4	Cobalt	11.6			P
7440-50-8	Copper	22.2			P
7439-89-6	Iron	48100			P
7439-92-1	Lead	15.7			P
7439-95-4	Magnesium	4300		N*	P
7439-96-5	Manganese	329		N*	P
7439-97-6	Mercury	0.35		N*	AV
7440-02-0	Nickel	15.4			P
7440-09-7	Potassium	1670			P
7782-49-2	Selenium	0.72	U		P
7440-22-4	Silver	0.24	U	N*	P
7440-23-5	Sodium	241	U		P
7440-28-0	Thallium	0.72	U		P
7440-62-2	Vanadium	76.8			P
7440-66-6	Zinc	47.2			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum	10000.0	10036.47	100.4	10000.0	10164.45	101.6	10184.82	101.8	P
Antimony	1000.0	985.13	98.5	1000.0	989.22	98.9	987.92	98.8	P
Arsenic	1000.0	1026.30	102.6	1000.0	1022.04	102.2	1014.75	101.5	P
Barium	1000.0	992.03	99.2	1000.0	988.46	98.8	989.76	99.0	P
Beryllium	1000.0	1048.97	104.9	1000.0	1055.15	105.5	1044.65	104.5	P
Cadmium	1000.0	1061.42	106.1	1000.0	1046.41	104.6	1034.56	103.5	P
Calcium	1000.0	1000.63	100.1	1000.0	1016.65	101.7	984.22	98.4	P
Chromium	1000.0	1006.79	100.7	1000.0	1018.49	101.8	1007.59	100.8	P
Cobalt	1000.0	1000.38	100.0	1000.0	991.75	99.2	984.27	98.4	P
Copper	1000.0	1015.82	101.6	1000.0	1008.71	100.9	1009.35	100.9	P
Iron	10000.0	10413.63	104.1	10000.0	10471.67	104.7	10369.94	103.7	P
Lead	1000.0	1009.85	101.0	1000.0	1012.47	101.2	1003.44	100.3	P
Magnesium	1000.0	961.56	96.2	1000.0	963.11	96.3	955.76	95.6	P
Manganese	1000.0	1042.20	104.2	1000.0	1039.56	104.0	1030.96	103.1	P
Mercury	4.0	3.69	92.2	Spike 4.0/2.0	3.88	97.0	1.91	95.5	AV
Nickel	1000.0	1015.13	101.5	1000.0	1021.89	102.2	1011.63	101.2	P
Potassium	10000.0	9922.34	99.2	10000.0	9796.05	98.0	9853.91	98.5	P
Selenium	1000.0	1025.64	102.6	1000.0	1000.67	100.1	999.33	99.9	P
Silver	500.0	484.59	96.9	500.0	487.82	97.6	486.05	97.2	P
Sodium	11000.0	11262.52	102.4	11000.0	11183.87	101.7	11184.74	101.7	P
Thallium	1000.0	971.37	97.1	1000.0	1011.08	101.1	999.53	100.0	P
Vanadium	1000.0	1000.67	100.1	1000.0	1004.43	100.4	997.90	99.8	P
Zinc	1000.0	1023.90	102.4	1000.0	1036.39	103.6	1022.12	102.2	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury				4.0	3.84	96.0	3.75	93.8	AV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum	10000.0	10410.37	104.1	10000.0	10365.99	103.7	10338.30	103.4	P
Antimony	1000.0	966.37	96.6	1000.0	977.10	97.7	978.10	97.8	P
Arsenic	1000.0	1011.53	101.2	1000.0	1002.90	100.3	998.66	99.9	P
Barium	1000.0	989.07	98.9	1000.0	1000.47	100.0	992.26	99.2	P
Beryllium	1000.0	1070.97	107.1	1000.0	1055.18	105.5	1086.81	108.7	P
Cadmium	1000.0	1046.77	104.7	1000.0	1013.22	101.3	1011.72	101.2	P
Calcium	1000.0	1042.32	104.2	1000.0	1028.23	102.8	1055.07	105.5	P
Chromium	1000.0	998.77	99.9	1000.0	991.03	99.1	993.92	99.4	P
Cobalt	1000.0	1013.16	101.3	1000.0	989.51	99.0	1004.34	100.4	P
Copper	1000.0	1019.79	102.0	1000.0	1021.59	102.2	1019.09	101.9	P
Iron	10000.0	10281.96	102.8	10000.0	10258.18	102.6	10283.19	102.8	P
Lead	1000.0	1002.15	100.2	1000.0	991.58	99.2	990.58	99.1	P
Magnesium	1000.0	952.54	95.3	1000.0	944.22	94.4	939.13	93.9	P
Manganese	1000.0	1036.54	103.7	1000.0	1015.58	101.6	1018.64	101.9	P
Mercury	4.0	3.68	92.0	4.0/2.0	4.21	105.2	2.09	104.5	AV
Nickel	1000.0	1006.04	100.6	1000.0	995.44	99.5	994.55	99.5	P
Potassium	10000.0	10172.75	101.7	10000.0	10258.37	102.6	10202.93	102.0	P
Selenium	1000.0	1027.85	102.8	1000.0	1005.38	100.5	1003.28	100.3	P
Silver	500.0	484.95	97.0	500.0	484.92	97.0	490.55	98.1	P
Sodium	11000.0	11309.54	102.8	11000.0	11240.13	102.2	11395.64	103.6	P
Thallium	1000.0	973.65	97.4	1000.0	993.87	99.4	992.70	99.3	P
Vanadium	1000.0	998.56	99.9	1000.0	992.16	99.2	995.53	99.6	P
Zinc	1000.0	1020.11	102.0	1000.0	995.05	99.5	1006.53	100.7	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

nitial Calibration Source: Accustandard,HighPurity

ontinuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury				2.0	2.11	105.5			AV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2B-IN
CRDL STANDARD FOR AA AND ICP

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

AA CRDL Standard Source: _____

ICP CRDL Standard Source: Spex

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120.0	119.93	99.9		
Arsenic				20.0	19.58	97.9		
Barium								
Beryllium				10.0	10.80	108.0		
Cadmium				10.0	10.73	107.3		
Calcium								
Chromium				20.0	20.40	102.0		
Cobalt				100.0	98.53	98.5		
Copper				50.0	48.59	97.2		
Iron								
Lead				6.0	5.55	92.5		
Magnesium								
Manganese				30.0	31.33	104.4		
Nickel				80.0	81.01	101.3		
Potassium								
Selenium				10.0	10.77	107.7		
Silver				20.0	20.04	100.2		
Sodium								
Thallium				20.0	19.75	98.8		
Vanadium				100.0	100.18	100.2		
Zinc				40.0	41.74	104.4		

Control Limits: no limits have been established by EPA at this time

USEPA - CLP

2B-IN

CRDL STANDARD FOR AA AND ICP

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

A CRDL Standard Source: _____

CP CRDL Standard Source: Spex

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120.0	118.04	98.4		
Arsenic				20.0	22.55	112.8		
Barium								
Beryllium				10.0	10.48	104.8		
Cadmium				10.0	10.33	103.3		
Calcium								
Chromium				20.0	19.76	98.8		
Cobalt				100.0	98.80	98.8		
Copper				50.0	51.11	102.2		
Iron								
Lead				6.0	5.02	83.7		
Magnesium								
Manganese				30.0	30.62	102.1		
Nickel				80.0	79.17	99.0		
Potassium								
Selenium				10.0	12.61	126.1		
Silver				20.0	19.82	99.1		
Sodium								
Thallium				20.0	19.47	97.4		
Vanadium				100.0	99.21	99.2		
Zinc				40.0	40.50	101.2		

Control Limits: no limits have been established by EPA at this time

USEPA - CLP

3

BLANKS

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

reparation Blank Matrix (soil/water): WATER - ICP; Soil - Hg

reparation Blank Concentration Units (ug/L or mg/kg): UG/L - ICP; mg/kg - Hg 8010 8100

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	50.0	U	50.0	U	50.0	U			12.500	U	P
Antimony	5.0	U	5.0	U	5.0	U			1.250	U	P
Arsenic	3.0	U	3.0	U	3.0	U			0.750	U	P
Barium	5.0	U	5.0	U	5.0	U			1.250	U	P
Beryllium	1.0	U	1.0	U	1.0	U			0.250	U	P
Cadmium	1.0	U	1.0	U	1.0	U			0.250	U	P
Calcium	1000.0	U	1000.0	U	1000.0	U			250.000	U	P
Chromium	2.0	U	2.0	U	2.0	U			0.500	U	P
Cobalt	5.0	U	5.0	U	5.0	U			1.250	U	P
Copper	5.0	U	5.0	U	5.0	U			1.250	U	P
Iron	30.0	U	30.0	U	30.0	U			7.500	U	P
Lead	1.5	U	1.5	U	1.5	U			0.375	U	P
Magnesium	1000.0	U	1000.0	U	1000.0	U			250.000	U	P
Manganese	3.0	U	3.0	U	3.0	U			0.750	U	P
Mercury	0.080	U	0.080	U	0.080	U	0.080	U	0.013	U	AV
Nickel	5.0	U	5.0	U	5.0	U			1.250	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U			250.000	U	P
Selenium	3.0	U	3.0	U	3.0	U			0.750	U	P
Silver	1.0	U	1.0	U	1.0	U			0.250	U	P
Sodium	1000.0	U	1000.0	U	1000.0	U			250.000	U	P
Thallium	3.0	U	3.0	U	3.0	U			0.750	U	P
Vanadium	5.0	U	5.0	U	5.0	U			1.250	U	P
Zinc	5.0	U	5.0	U	5.0	U			1.250	U	P

3
BLANKS

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

reparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury			0.080	U					0.013	U	AV

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Preparation Blank Matrix (soil/water): SOIL - ICP; WATER - Hg

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG - ICP; ug/L - Hg SMO 5/31/00

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	50.0	U	50.0	U	50.0	U			10.000	U	P
Antimony	5.0	U	5.0	U	5.0	U			1.000	U	P
Arsenic	3.0	U	3.0	U	3.0	U			0.600	U	P
Barium	5.0	U	5.0	U	5.0	U			1.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U			0.200	U	P
Cadmium	1.0	U	1.0	U	1.0	U			0.200	U	P
Calcium	1000.0	U	1000.0	U	1000.0	U			200.000	U	P
Chromium	2.0	U	2.0	U	2.0	U			0.400	U	P
Cobalt	5.0	U	5.0	U	5.0	U			1.000	U	P
Copper	5.0	U	5.0	U	5.0	U			1.000	U	P
Iron	30.0	U	30.0	U	30.0	U			6.000	U	P
Lead	1.5	U	1.5	U	1.5	U			0.300	U	P
Magnesium	1000.0	U	1000.0	U	1000.0	U			200.000	U	P
Manganese	3.0	U	3.0	U	3.0	U			0.600	U	P
Mercury	0.080	U	0.080	U	0.080	U	0.080	U	0.080	U	AV
Nickel	5.0	U	5.0	U	5.0	U			1.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U			200.000	U	P
Selenium	3.0	U	3.0	U	3.0	U			0.600	U	P
Silver	1.0	U	1.0	U	1.0	U			0.200	U	P
Sodium	1000.0	U	1000.0	U	1000.0	U			200.000	U	P
Thallium	3.0	U	3.0	U	3.0	U			0.600	U	P
Vanadium	5.0	U	5.0	U	5.0	U			1.000	U	P
Zinc	5.0	U	5.0	U	5.0	U			1.000	U	P

USEPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

CP ID Number: TJA61E TRACE ICP ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	500000	500000	503130	508643.1	101.7			
Antimony	0	600	0	624.1	104.0			
Arsenic	0	100	1	109.0	109.0			
Barium	0	500	2	541.1	108.2			
Beryllium	0	500	0	519.8	104.0			
Cadmium	0	1000	2	991.2	99.1			
Calcium	500000	500000	459429	467009.7	93.4			
Chromium	0	500	0	500.8	100.2			
Cobalt	0	500	-3	471.5	94.3			
Copper	0	500	0	548.3	109.7			
Iron	200000	200000	196292	198810.3	99.4			
Lead	0	50	2	52.4	104.8			
Magnesium	500000	500000	506645	511681.6	102.3			
Manganese	0	500	-12	502.3	100.5			
Nickel	0	1000	-2	950.3	95.0			
Potassium	0	0	44	45.9				
Selenium	0	50	-4	44.7	89.4			
Silver	0	200	0	213.4	106.7			
Sodium	0	0	309	262.5				
Thallium	0	100	-8	89.4	89.4			
Vanadium	0	500	0	500.7	100.1			
Zinc	0	1000	-11	929.8	93.0			

4

ICP INTERFERENCE CHECK SAMPLE

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

CP ID Number: TJA61E TRACE ICP ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	500000	500000	519683	530999.9	106.2			
Antimony	0	600	2	608.2	101.4			
Arsenic	0	100	0	106.1	106.1			
Barium	0	500	2	539.6	107.9			
Beryllium	0	500	0	525.3	105.1			
Cadmium	0	1000	3	952.3	95.2			
Calcium	500000	500000	445639	457249.5	91.4			
Chromium	0	500	1	486.2	97.2			
Cobalt	0	500	0	475.1	95.0			
Copper	0	500	2	552.6	110.5			
Iron	200000	200000	195341	199489.1	99.7			
Lead	0	50	3	51.7	103.4			
Magnesium	500000	500000	504293	513699.8	102.7			
Manganese	0	500	-12	487.9	97.6			
Nickel	0	1000	-2	919.4	91.9			
Potassium	0	0	53	53.1				
Selenium	0	50	-7	45.1	90.2			
Silver	0	200	0	212.7	106.4			
Sodium	0	0	225	169.4				
Thallium	0	100	-7	92.2	92.2			
Vanadium	0	500	1	492.7	98.5			
Zinc	0	1000	-14	893.6	89.4			

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB008 (0.5-1.5)S

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Level (low/med): LOW

Solids for Sample: 84.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		31162.2500		29676.8000		471.48	315.1		P
Antimony	75 - 125	7.5559		1.2025	U	58.93	12.8	N	P
Arsenic	75 - 125	57.8083		4.0494		58.93	91.2		P
Barium	75 - 125	539.3455		75.1290		471.48	98.5		P
Beryllium	75 - 125	13.4502		0.9344	B	11.79	106.2		P
Cadmium	75 - 125	29.9094		0.2405	U	29.47	101.5		P
Calcium		7391.2080		6097.2150		1178.69	109.8		P
Chromium	75 - 125	80.2819		36.1841		47.15	93.5		P
Cobalt	75 - 125	128.9455		11.6468		117.87	99.5		P
Copper	75 - 125	83.2433		22.1565		58.93	103.7		P
Iron		45808.8800		48118.9200		235.74	-979.9		P
Lead	75 - 125	73.4970		15.6860		58.93	98.1		P
Magnesium	75 - 125	5270.6630		4303.3720		1178.69	82.1		P
Manganese	75 - 125	394.2219		329.2201		117.87	55.1	N	P
Mercury	75 - 125	0.5962		0.3535		0.37	65.6	N	AV
Nickel	75 - 125	131.6145		15.4495		117.87	98.6		P
Potassium	75 - 125	2979.7410		1668.3720		1178.69	111.3		P
Selenium	75 - 125	53.0731		0.7215	U	58.93	90.1		P
Silver	75 - 125	119.2011		0.2405	U	58.93	202.3	N	P
Sodium	75 - 125	1367.5910		240.5003	U	1178.69	116.0		P
Thallium	75 - 125	55.1558		0.7215	U	58.93	93.6		P
Vanadium	75 - 125	189.8594		76.8362		117.87	95.9		P
Zinc	75 - 125	163.2530		47.1618		117.87	98.5		P

Comments:

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB008 (0.5-1.5)SD

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Matrix (soil/water): SOLID Level (low/med): LOW

Solids for Sample: 84.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		32490.8000		29676.8000		466.85	602.8		P
Antimony	75 - 125	6.8464		1.2025	U	58.36	11.7	N	P
Arsenic	75 - 125	53.9376		4.0494		58.36	85.5		P
Barium	75 - 125	531.0630		75.1290		466.85	97.7		P
Beryllium	75 - 125	13.3474		0.9344	B	11.67	106.4		P
Cadmium	75 - 125	29.1721		0.2405	U	29.18	100.0		P
Calcium		3168.9430		6097.2150		1167.13	-250.9		P
Chromium	75 - 125	84.7826		36.1841		46.69	104.1		P
Cobalt	75 - 125	127.2318		11.6468		116.71	99.0		P
Copper	75 - 125	84.1439		22.1565		58.36	106.2		P
Iron		50169.1900		48118.9200		233.43	878.3		P
Lead	75 - 125	74.0102		15.6860		58.36	99.9		P
Magnesium		3159.3520		4303.3720		1167.13	-98.0	N	P
Manganese	75 - 125	530.1288		329.2201		116.71	172.1	N	P
Mercury	75 - 125	0.4732		0.3535		0.40	29.9	N	AV
Nickel	75 - 125	129.9490		15.4495		116.71	98.1		P
Potassium	75 - 125	3002.5770		1668.3720		1167.13	114.3		P
Selenium	75 - 125	49.4431		0.7215	U	58.36	84.7		P
Silver	75 - 125	57.9186		0.2405	U	58.36	99.2		P
Sodium	75 - 125	1344.0520		240.5003	U	1167.13	115.2		P
Thallium	75 - 125	54.1035		0.7215	U	58.36	92.7		P
Vanadium	75 - 125	195.4805		76.8362		116.71	101.7		P
Zinc	75 - 125	176.4581		47.1618		116.71	110.8		P

Comments:

USEPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB008 (0.5-1.5)A

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS _____ SDG No.: Radford001

atrix (soil/water): SOLID Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added(SA)	%R	Q	M
Aluminum		125348.30		123396.14		2000.0	97.6		P
Antimony		250.11		5.00	U	250.0	100.0		P
Arsenic		281.68		16.84		250.0	105.9		P
Barium		2434.27		312.39		2000.0	106.1		P
Beryllium		59.96		3.89	B	50.0	112.1		P
Cadmium		132.45		1.00	U	125.0	106.0		P
Calcium		30547.88		25352.22		5000.0	103.9		P
Chromium		361.06		150.45		200.0	105.3		P
Cobalt		574.05		48.43		500.0	105.1		P
Copper		367.99		92.13		250.0	110.3		P
Iron		200343.50		200078.46		1000.0	26.5		P
Lead		325.61		65.22		250.0	104.2		P
Magnesium		22830.72		17893.42		5000.0	98.7		P
Manganese		1896.27		1368.90		500.0	105.5		P
Nickel		583.20		64.24		500.0	103.8		P
Potassium		12992.61		6937.09		5000.0	121.1		P
Selenium		251.92		3.00	U	250.0	100.8		P
Silver		266.99		1.00	U	250.0	106.8		P
Sodium		6049.51		1000.00	U	5000.0	121.0		P
Thallium		248.17		3.00	U	250.0	99.3		P
Vanadium		845.48		319.48		500.0	105.2		P
Zinc		712.00		196.10		500.0	103.2		P

omments: _____

6
DUPLICATES

SAMPLE NO.

1034SB008 (0.5-1.5)SD

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

atrix (soil/water): SOLID Level (low/med): LOW

Solids for Sample: 84.0 % Solids for Duplicate: 84.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		31162.2500		32490.8000		4.2		P
Antimony		7.5559		6.8464		9.9		P
Arsenic		57.8083		53.9376		6.9		P
Barium		539.3455		531.0630		1.5		P
Beryllium		13.4502		13.3474		0.8		P
Cadmium		29.9094		29.1721		2.5		P
Calcium		7391.2080		3168.9430		80.0	*	P
Chromium		80.2819		84.7826		5.5		P
Cobalt		128.9455		127.2318		1.3		P
Copper		83.2433		84.1439		1.1		P
Iron		45808.8800		50169.1900		9.1		P
Lead		73.4970		74.0102		0.7		P
Magnesium		5270.6630		3159.3520		50.1	*	P
Manganese		394.2219		530.1288		29.4	*	P
Mercury		0.5962		0.4732		23.0	*	AV
Nickel		131.6145		129.9490		1.3		P
Potassium		2979.7410		3002.5770		0.8		P
Selenium		53.0731		49.4431		7.1		P
Silver		119.2010		57.9186		69.2	*	P
Sodium		1367.5910		1344.0520		1.7		P
Thallium		55.1558		54.1035		1.9		P
Vanadium		189.8594		195.4805		2.9		P
Zinc		163.2529		176.4581		7.8		P

7

LABORATORY CONTROL SAMPLE

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

olid LCS Source: HighPurity

queous LCS Source: HighPurity

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	40.0	45.79	114.5						
Antimony	5.0	5.33	106.6						
Arsenic	5.0	5.03	100.6						
Barium	40.0	38.91	97.3						
Beryllium	1.0	1.10	110.0						
Cadmium	2.5	2.60	104.0						
Calcium	600.0	603.96	100.7						
Chromium	4.0	3.93	98.2						
Cobalt	10.0	9.49	94.9						
Copper	5.0	4.73	94.6						
Iron	20.0	22.46	112.3						
Lead	5.0	5.08	101.6						
Magnesium	600.0	560.83	93.5						
Manganese	10.0	10.20	102.0						
Mercury				0.33	0.29		0.3	0.4	87.9
Nickel	10.0	9.64	96.4						
Potassium	600.0	549.73	91.6						
Selenium	5.0	5.51	110.2						
Silver	5.0	4.91	98.2						
Sodium	600.0	618.35	103.1						
Thallium	5.0	4.55	91.0						
Vanadium	10.0	9.77	97.7						
Zinc	10.0	10.81	108.1						

7

LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Solid LCS Source: HighPurity

Aqueous LCS Source: HighPurity

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Mercury				0.33	0.31		0.3	0.4	93.9

7

LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford001

Solid LCS Source: HighPurity

Aqueous LCS Source: HighPurity

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum				400.0	434.8		320.0	480.0	108.7
Antimony				50.0	49.3		40.0	60.0	98.6
Arsenic				50.0	50.9		40.0	60.0	101.8
Barium				400.0	408.7		320.0	480.0	102.2
Beryllium				10.0	10.7		8.0	12.0	107.0
Cadmium				25.0	26.2		20.0	30.0	104.8
Calcium				1000.0	1023.9		800.0	1200.0	102.4
Chromium				40.0	41.0		32.0	48.0	102.5
Cobalt				100.0	101.5		80.0	120.0	101.5
Copper				50.0	52.0		40.0	60.0	104.0
Iron				200.0	209.0		160.0	240.0	104.5
Lead				50.0	51.2		40.0	60.0	102.4
Magnesium				1000.0	951.2	B	800.0	1200.0	95.1
Manganese				100.0	103.8		80.0	120.0	103.8
Mercury	2.00	2.05	102.5						
Nickel				100.0	100.3		80.0	120.0	100.3
Potassium				1000.0	1115.9		800.0	1200.0	111.6
Selenium				50.0	50.0		40.0	60.0	100.0
Silver				50.0	50.6		40.0	60.0	101.2
Sodium				1000.0	1063.4		800.0	1200.0	106.3
Thallium				50.0	48.3		40.0	60.0	96.6
Vanadium				100.0	102.3		80.0	120.0	102.3
Zinc				100.0	102.1		80.0	120.0	102.1

ARCADIS

SDG #RADFORD002

SUMMARY PACKAGE

VOLATILE SECTION

ORGANIC CASE NARRATIVE - VOLATILES
Arcadis – Radford002

Date Sampled	Date Received	Lab ID	Client ID
05/09/08	05/10/08	0805104-01	1041HP004 (050908)
05/09/08	05/10/08	0805104-02	1041HP001 (050908)
05/09/08	05/10/08	0805104-03	1041HP003 (050908)
05/09/08	05/10/08	0805104-04	TB-4 (050908-01)
05/09/08	05/10/08	0805104-05	1041SB003 (0.5-1.5)
05/09/08	05/10/08	0805104-06	1041SB001 (0.5-1.5)
05/09/08	05/10/08	0805104-07	1034SB006 (0.5-1.5)
05/09/08	05/10/08	0805104-08	1034DUP01 (0.5-1.5)
05/09/08	05/10/08	0805104-09	1034SB007 (0.5-1.5)
05/09/08	05/10/08	0805104-10	SSB-026 (19-20)
05/09/08	05/10/08	0805104-11	SSB-025 (19-20)
05/09/08	05/10/08	0805104-12	SSB-021 (23-24)
05/09/08	05/10/08	0805105-01	1041SB003 (7-8)
05/09/08	05/10/08	0805105-02	1041SB001 (7-8)
05/09/08	05/10/08	0805105-03	1034SB006 (7-8)
05/09/08	05/10/08	0805105-04	1034SB007 (7-8)
05/10/08	05/13/08	0805115-01	5GP-HP021 (05102008)
05/10/08	05/13/08	0805115-02	5GP-HP026 (05102008)
05/10/08	05/13/08	0805115-03	5GP-HP025 (05102008)
05/10/08	05/13/08	0805115-04	1549 HP008 (05102008)
05/10/08	05/13/08	0805115-05	TB-4 (05102008-01)
05/10/08	05/13/08	0805115-06	EB001 (05102008)

Method: The samples were extracted/analyzed for client specified analyte lists by USEPA SW-846 Methods 5030B/8260B (purge and trap followed by capillary column GC/MS) for waters or 5035/8260B (encore field sampling with laboratory preservation then purge and trap followed by capillary column GC/MS) for soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note: Soil samples were prepared then held pending GW results or deep soils were held pending shallow soil results. Hold sample analyses were requested 5/19/08. E-mail instructions are attached.
- BFB Tuning: All method tuning criteria were met.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded as indicated in the following clarifications:

1. VOA5 ICV analyzed with the initial calibration exceeded 25% difference for acetone with a negative bias at 27.5%. All reported laboratory control samples for this instrument were within 25% difference for acetone so no further action was taken.
2. VOA1 CCVs analyzed 5/14/08 exceeded the 20% difference limit with a positive bias for acetone, 2-butanone, methyl acetate and trichloroethene. Reported concentrations of acetone above the quantitation limit are qualified with an "X" in the associated samples. The other analytes were not detected above the quantitation limit in the associated samples.
3. VOA4 CCVs analyzed 5/14/08 met criteria for all analytes with the exception of bromomethane which exceeded 20% difference with a negative bias at 42.1%. All results for this analyte are qualified with a "Y" flag on the form Is and in the EDD.
4. VOA4 CCVs analyzed 5/15/08 met criteria for averaging on the main mix and were within limits for 1,4-dioxane.

5. VOA5 CCVs analyzed 5/20/08 at 17:17 and 17:48 met criteria for averaging on the main mix but exceeded 20% difference for 1,4-dioxane with a negative bias at 21.1%. All results for this analyte are qualified with a "Y" flag on the form Is and in the EDD.

- Method Blank Results: Chloromethane and/or methylene chloride were detected in some of the method blanks associated to these samples. Reported concentrations in the associated samples are qualified with a "B".
- Surrogate Recoveries: All recoveries were within limits.
- V4BLK0514LCS/LCSD results: Recoveries of chloromethane exceeded the limit of 125% at (103%)/134% All other recoveries and relative percent differences were within limits.
- V1BLK0514LCS results: Recovery of 2-butanone exceeded the limit of 160% at 168%. All other recoveries were within limits.
- V4BLK0515LCS: All recoveries were within limits.
- V5BLK0520ELCS results: Recovery of 2-butanone exceeded the limit of 160% at 176%. All other recoveries were within limits.
- MS/MSD results: Not applicable.
- Internal Standard Area Counts: All internal standard area counts were within limits.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Monday, May 19, 2008 3:59 PM
To: MMcGinnity@EmpirLabs.com; RVining@HNTB.com
Cc: Powell, Jace'que; Borne, Rachelle; Sharpe, Christopher
Subject: RE: Hold Samples

OK this is the story

HOLD Samples with IDs that begin with

1041 – can you get 24 hour TAT for VOCs?

1034 – second priority to complete after the 1041s

1549 – analyze as 3rd priority, but I think with HTs. Everything is out of hold by Saturday.

Let me know and call me at home if you have any questions 504-486-7354

Thanks
Jane

Jane Kennedy
ARCADIS
3850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002
Phone: (504) 832-4174
Cell: (225) 205-8256

From: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
Sent: Monday, May 19, 2008 7:51 AM
To: Kennedy, Jane
Cc: Powell, Jace'que; Borne, Rachelle
Subject: RE: Hold Samples

Anything new on this today? I forwarded the information in case they got the VOA soils working but we haven't extracted anything else at the moment. Attached are the metals results for 0805104 missing Hg - plan to have that today.

Thanks,
Marcia

-----Original Message-----
From: Kennedy, Jane [mailto:Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

Analyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

Extract and hold all of the other "HOLD" samples.

I am waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
jane

0509 2008-01

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 3

Project Number/Name GP08 RAAP.0047 / RAAP

Project Location Radford, VA

Laboratory Empirical Labs

Project Manager Diane Wisbeck / Tim Llewellyn

Sampler(s)/Affiliation SG/MW AREADS

0805104

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs	SVOCs (HCl)	PCBs (none)	Explosives (none)	Metals (none)	(Nitric)	Remarks	Total
-01	1041HP004(0509008)	GW	5/9/08 09:00		X	X	X	X	X			10
-02	1041HP001(0509200[illegible])	GW	5/9/08 08:30		X	X	X	X	X		limited water; only 1L Ambers submitted	8
-03	1041HP003(0509200[illegible])	GW	5/9/08 11:20		X	X	X	X	X			10
-04	TB-4(0509 2008-01)	L	5/9/08 —		X							2

Sample Matrix: L = Liquid; S = Solid; A = Air GW=groundwater

Total No. of Bottles/ Containers 30

Relinquished by: Sandra Grabowski	Organization: AREADS	Date 5/9/08	Time 17:45	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical Labs	Date 5/12/08	Time 9:00	(Yes) No N/A	

Special Instructions/Remarks:

Questions, call Sandra Grabowski at 410-713-9921 or Jane Kennedy at 225-205-8256

1.5°C, 2.4°C, 3.2°C

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

05092008-03

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Project Number/Name GP08RAAP.0047/RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck / Tim Llewellyn

Sampler(s)/Affiliation SG/MW ARCADIS

0805104

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOCs	SVOCs / PCBs	Metals	Explosives	Moisture Content		Remarks	Total
-05	10415B003(0.5-1.5)	So	5/9/08 10:20		X	X	X	X			7 day TAT	6
-06	10415B001(0.5-1.5)		5/9/08 12:15		X	X	X	X			7day TAT	6
-07	10345B006(0.5-1.5)		5/9/08 12:50		X	X	X	X			7day TAT	6
-08	10345DUP01(0.5-1.5)		5/9/08 12:50		X	X	X	X			7day TAT	6
-09	10345B007(0.5-1.5)		5/9/08 13:30		X	X	X	X			7day TAT	6
-10	SSB-026(19-20)		5/9/08 14:50		X				X			4
-11	SSB-025(19-20)		5/9/08 15:30		X				X			4
-12	SSB-02[illegible](23-24)		5/9/08 16:30		X				X			4

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 42

						Seal Intact?
Relinquished by:	Sandra Grabowski	Organization:	ARCADIS	Date	5/9/08	Time 17:45	
Received by:		Organization:		Date	/ /	Time	Yes No N/A
Relinquished by:		Organization:		Date	/ /	Time	Seal Intact?
Received by:	[signature]	Organization:	Empirical Labs	Date	5/12/08	Time 9:00	(Yes) No N/A

Special Instructions/Remarks: _____

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05 12/01

05092008-03

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 3 of 3

Project Number/Name EP08RAAP.0047 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck/Tim Hayden

Sampler(s)/Affiliation SG/MW ARCADIS

0805105

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOCs	SVOCs, PCBs	Metals	Explosives			Remarks	Total
-01	1041SB003(7-8)	SO	5/9/08 10:46		X	X	X	X			(*)HOLD	6
-02	1041SB004(7-8)	SO	5/9/08 12:25		X	X	X	X			(*)HOLD	6
-03	1034SB006(7-8)	SO	5/9/08 13:00		X	X	X	X			(*)HOLD	6
-04	1034SB007(7-8)	SO	5/9/08 13:40		X	X	X	X			(*)HOLD	6

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 24

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 5/9/08	Time 17:15	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical Labs	Date 5/12/08	Time 9:00	(Yes) No N/A	

Special Instructions/Remarks:

(*) HOLD above samples pending results from sample listed on previous page (05092008-02)

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex SPECIFY ☐ Lab Courier ☐ Other SPECIFY

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

05102008-01

Project Number/Name GP08RAAP.0047 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck/Tim Llewellyn

Sampler(s)/Affiliation SG / ARCADIS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs	Metals	SVOCs	PCBs	Explosives		Remarks	Total
				ANALYSIS / METHOD / SIZE							
1805 15											
-01 5GP-HP021(05102008)	GW	5/10/08 7:50		X							3
-02 5GP-HP026(05102008)	GW	5/10/08 8:15		X							3
-03 5GP-HP025(05102008)	GW	5/10/08 8:40		X							3
-04 1549 HP008(05102008)	GW	5/10/08 09:15		X	X	X*	X	X		(*) Insufficient water available; only 2 Ambers submitted	6
-05 TB-4 (05102008-01)	L	5/10/08 —		X							2
-06 EB001(05102008)	WQ	5/10/08 1200		X	X	X	X	X			10
~~EB~~											
		* SVOC cancelled. 1150 mL after centrifuge - use 1L explosives + remainder PCB 5/14/08									1.5mL-1.5mL

Sample Matrix: L = Liquid; S = Solid; A = Air GW = Groundwater

Total No. of Bottles/Containers: 27

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 5/12/08	Time 17:00	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical	Date 5/13/08	Time 09:00	Yes No N/A	

Special Instructions/Remarks: 3.1°C

Delivery Method: ☐ In Person ☒ Common Carrier FedEX ☐ Lab Courier ☐ Other

SPECIFY SPECIFY

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805104 COC ID(s): 05092008-1, -2, -3

Client Arcadis Project Radford, VA

Sample Custodian WS Today's Date 5/12/08

Date/Time Samples Received 5/12/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/12/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

WS

Number of Custody Seals on Cooler(s): 1 Seal Date(s): ~~5/11/0~~ 5/9/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 3 Temp. of Coolers 1.5°C, 2.4°C, 3.2°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

_____

_____

_____

Comments:

_____

_____

_____

_____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805105 COC ID(s): 05092008-3

Client Arcadis Project Radford, VA

Sample Custodian WS Today's Date 5/12/08

Date/Time Samples Received 5/12/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/12/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 5/9/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 3 Temp. of Coolers 1.5°C, 2.4°C, 3.2°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

_____

_____

_____

Comments:

_____

_____

_____

_____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805115 COC ID(s): 05102008 -01

Client Arcadis Project Radford, VA

Sample Custodian WS Today's Date 5/13/08

Date/Time Samples Received 5/13/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/13/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 5/12/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 1 Temp. of Coolers 3.1°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

_____

_____

_____

Comments:

_____

_____

_____

_____

Sample Delivery Group Assignment Form

CLIENT: Arcadis | **QC LEVEL: IV/EDD**

PROJECT NAME: RAAD | **Analytical Due: 05/30/08**

SDG # Radford002 | **Report Due: 06/04/08**

MATRIX: Groundwater/Soil | **CLOSED: 05/13/08**

Sample Type/count	Date Sampled	Date Rec'd	Lab ID	Client ID	VOA 8260B	SVOC 8270	PCBs 8082	EXPL+2 8330B	TAL Metals 6010B/7471A
1	05/09/08	05/10/08	0805104-01	1041HP004 (050908)	X	X	X	X	X**
2	05/09/08	05/10/08	0805104-02	1041HP001 (050908)	X	X	X	X	X**
3	05/09/08	05/10/08	0805104-03	1041HP003 (050908)	X	X	X	X	X**
TB	05/09/08	05/10/08	0805104-04	TB-4 (050908-01)	X				
4	05/09/08	05/10/08	0805104-05	1041SB003 (0.5-1.5)	4BD	4BD	4BD	4BD	4BD
5	05/09/08	05/10/08	0805104-06	1041SB001 (0.5-1.5)	4BD	4BD	4BD	4BD	4BD
6	05/09/08	05/10/08	0805104-07	1034SB006 (0.5-1.5)	4BD	4BD	4BD	4BD	4BD
7	05/09/08	05/10/08	0805104-08	1034DUP01 (0.5-1.5)	4BD	4BD	4BD	4BD	4BD
8	05/09/08	05/10/08	0805104-09	1034SB007 (0.5-1.5)	4BD	4BD	4BD	4BD	4BD
9	05/09/08	05/10/08	0805104-10	SSB-026 (19-20)	X				
10	05/09/08	05/10/08	0805104-11	SSB-025 (19-20)	X				
11	05/09/08	05/10/08	0805104-12	SSB-021 (23-24)	X				
H14	05/09/08	05/10/08	0805105-01	1041SB003 (7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
H15	05/09/08	05/10/08	0805105-02	1041SB001 (7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
H16	05/09/08	05/10/08	0805105-03	1034SB006 (7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
H17	05/09/08	05/10/08	0805105-04	1034SB007 (7-8)	Analyze 5/19	Radford003	Radford003	Radford003	Radford003
12	05/10/08	05/13/08	0805115-01	5GP-HP021 (05102008)	X				
13	05/10/08	05/13/08	0805115-02	5GP-HP026 (05102008)	X				
14	05/10/08	05/13/08	0805115-03	5GP-HP025 (05102008)	X				
15	05/10/08	05/13/08	0805115-04	1549 HP008 (05102008)	X	X* cancelled	X* 150ml-1.5ml	X* full volume	X
TB	05/10/08	05/13/08	0805115-05	TB-4 (05102008-01)	X				
EB	05/10/08	05/13/08	0805115-06	EB001 (05102008)	X	X	X	X	X
HOLD samples moved to SDG Radford003 5/19/08									

X* = LIMITED VOLUME RECEIVED - 1150ml total after centrifuge to separate from sedimentation - SVOCs cancelled, PCBs 150ml-1ml and explosives full volume.

X** = sample received preserved with sedimentation - as per the method, sample was shaken prior to obtaining an aliquot for digestion/analysis.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP004
(050908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510401

Level: (low/med) LOW Date Sampled: 05/09/08 09:00

% Moisture: not dec. _____ Date Analyzed: 05/14/08 11:46

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		UY
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	44	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP004
(050908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510401

Level: (low/med) LOW Date Sampled: 05/09/08 09:00

% Moisture: not dec. _____ Date Analyzed: 05/14/08 11:46

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP001
(05092008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510402

Level: (low/med) LOW Date Sampled: 05/09/08 08:30

% Moisture: not dec. _____ Date Analyzed: 05/14/08 12:15

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	3.8	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		UY
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	35	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP001
(05092008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510402

Level: (low/med) LOW Date Sampled: 05/09/08 08:30

% Moisture: not dec. _____ Date Analyzed: 05/14/08 12:15

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP003
(05092008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510403

Level: (low/med) LOW Date Sampled: 05/09/08 11:20

% Moisture: not dec. _____ Date Analyzed: 05/14/08 12:45

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	2.8	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		UY
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	42	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP003
(05092008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510403

Level: (low/med) LOW Date Sampled: 05/09/08 11:20

% Moisture: not dec. _____ Date Analyzed: 05/14/08 12:45

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-4 (05 0908-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510404

Level: (low/med) LOW Date Sampled: 05/09/08 :

% Moisture: not dec. _____ Date Analyzed: 05/14/08 09:48

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		UY
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	1.5	B
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-4 (05 0908-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0510404

Level: (low/med) LOW Date Sampled: 05/09/08 :

% Moisture: not dec. _____ Date Analyzed: 05/14/08 09:48

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-05

Sample wt/vol: 5.4 (g/mL) G Lab File ID: 0510405

Level: (low/med) LOW Date Sampled: 05/09/08 10:20

% Moisture: not dec. 20 Date Analyzed: 05/14/08 17:26

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.3	12	10	J
71-43-2	Benzene	0.55	5.8		U
74-97-5	Bromochloromethane	0.49	5.8		U
75-27-4	Bromodichloromethane	0.35	5.8		U
75-25-2	Bromoform	1.2	5.8		U
74-83-9	Bromomethane	0.84	5.8		U
78-93-3	2-Butanone	1.6	12		U
75-15-0	Carbon disulfide	1.5	5.8		U
56-23-5	Carbon tetrachloride	1.0	5.8		U
108-90-7	Chlorobenzene	0.39	5.8		U
75-00-3	Chloroethane	1.3	5.8		U
67-66-3	Chloroform	0.64	5.8		U
74-87-3	Chloromethane	0.60	5.8		U
110-82-7	Cyclohexane	0.63	5.8		U
124-48-1	Dibromochloromethane	0.39	5.8		U
96-12-8	1,2-Dibromo-3-chloropropane	1.4	5.8		U
106-93-4	1,2-Dibromoethane	0.50	5.8		U
95-50-1	1,2-Dichlorobenzene	0.43	5.8		U
541-73-1	1,3-Dichlorobenzene	0.98	5.8		U
106-46-7	1,4-Dichlorobenzene	0.64	5.8		U
75-71-8	Dichlorodifluoromethane	1.3	5.8		U
75-34-3	1,1-Dichloroethane	0.63	5.8		U
107-06-2	1,2-Dichloroethane	0.53	5.8		U
75-35-4	1,1-Dichloroethene	1.4	5.8		U
156-59-2	cis-1,2-Dichloroethene	1.4	5.8		U
156-60-5	trans-1,2-Dichloroethene	1.3	5.8		U
78-87-5	1,2-Dichloropropane	0.53	5.8		U
10061-01-5	cis-1,3-Dichloropropene	0.58	5.8		U
10061-02-6	trans-1,3-Dichloropropene	0.37	5.8		U
123-91-1	1,4-Dioxane	0.58	58		U
100-41-4	Ethylbenzene	0.87	5.8		U
591-78-6	2-Hexanone	2.7	12		U
98-82-8	Isopropylbenzene	1.0	5.8		U
79-20-9	Methyl acetate	1.8	5.8		U
108-87-2	Methyl cyclohexane	0.35	5.8		U
75-09-2	Methylene chloride	0.72	5.8	9.3	B
108-10-1	4-Methyl-2-pentanone	0.67	12		U
1634-04-4	Methyl-tert-butyl ether	0.37	5.8		U
100-42-5	Styrene	0.41	5.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-05

Sample wt/vol: 5.4 (g/mL) G Lab File ID: 0510405

Level: (low/med) LOW Date Sampled: 05/09/08 10:20

% Moisture: not dec. 20 Date Analyzed: 05/14/08 17:26

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.50	5.8		U
127-18-4	Tetrachloroethene	1.1	5.8		U
108-88-3	Toluene	1.00	5.8		U
87-61-6	1,2,3-Trichlorobenzene	0.49	5.8		U
120-82-1	1,2,4-Trichlorobenzene	0.21	5.8		U
71-55-6	1,1,1-Trichloroethane	1.0	5.8		U
79-00-5	1,1,2-Trichloroethane	0.41	5.8		U
79-01-6	Trichloroethene	0.99	5.8	1.5	J
76-13-1	Trichlorotrifluoroethane	0.64	5.8		U
75-69-4	Trichlorofluoromethane	1.1	5.8		U
75-01-4	Vinyl chloride	1.3	5.8		U
1330-20-7	Xylene(total)	0.81	5.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-06

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0510406

Level: (low/med) LOW Date Sampled: 05/09/08 12:15

% Moisture: not dec. 21 Date Analyzed: 05/14/08 18:02

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.2	11		U
71-43-2	Benzene	0.53	5.6		U
74-97-5	Bromochloromethane	0.47	5.6		U
75-27-4	Bromodichloromethane	0.34	5.6		U
75-25-2	Bromoform	1.1	5.6		U
74-83-9	Bromomethane	0.81	5.6		U
78-93-3	2-Butanone	1.6	11		U
75-15-0	Carbon disulfide	1.5	5.6		U
56-23-5	Carbon tetrachloride	0.99	5.6		U
108-90-7	Chlorobenzene	0.38	5.6		U
75-00-3	Chloroethane	1.2	5.6		U
67-66-3	Chloroform	0.62	5.6		U
74-87-3	Chloromethane	0.59	5.6		U
110-82-7	Cyclohexane	0.61	5.6		U
124-48-1	Dibromochloromethane	0.38	5.6		U
96-12-8	1,2-Dibromo-3-chloropropane	1.4	5.6		U
106-93-4	1,2-Dibromoethane	0.48	5.6		U
95-50-1	1,2-Dichlorobenzene	0.42	5.6		U
541-73-1	1,3-Dichlorobenzene	0.95	5.6		U
106-46-7	1,4-Dichlorobenzene	0.62	5.6		U
75-71-8	Dichlorodifluoromethane	1.2	5.6		U
75-34-3	1,1-Dichloroethane	0.61	5.6		U
107-06-2	1,2-Dichloroethane	0.52	5.6		U
75-35-4	1,1-Dichloroethene	1.4	5.6		U
156-59-2	cis-1,2-Dichloroethene	1.4	5.6		U
156-60-5	trans-1,2-Dichloroethene	1.2	5.6		U
78-87-5	1,2-Dichloropropane	0.52	5.6		U
10061-01-5	cis-1,3-Dichloropropene	0.56	5.6		U
10061-02-6	trans-1,3-Dichloropropene	0.36	5.6		U
123-91-1	1,4-Dioxane	0.56	56		U
100-41-4	Ethylbenzene	0.84	5.6		U
591-78-6	2-Hexanone	2.6	11		U
98-82-8	Isopropylbenzene	0.99	5.6		U
79-20-9	Methyl acetate	1.8	5.6		U
108-87-2	Methyl cyclohexane	0.34	5.6		U
75-09-2	Methylene chloride	0.70	5.6	6.9	B
108-10-1	4-Methyl-2-pentanone	0.65	11		U
1634-04-4	Methyl-tert-butyl ether	0.36	5.6		U
100-42-5	Styrene	0.39	5.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-06

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0510406

Level: (low/med) LOW Date Sampled: 05/09/08 12:15

% Moisture: not dec. 21 Date Analyzed: 05/14/08 18:02

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.48	5.6		U
127-18-4	Tetrachloroethene	1.1	5.6		U
108-88-3	Toluene	0.97	5.6		U
87-61-6	1,2,3-Trichlorobenzene	0.47	5.6		U
120-82-1	1,2,4-Trichlorobenzene	0.20	5.6		U
71-55-6	1,1,1-Trichloroethane	1.0	5.6		U
79-00-5	1,1,2-Trichloroethane	0.39	5.6		U
79-01-6	Trichloroethene	0.96	5.6		U
76-13-1	Trichlorotrifluoroethane	0.62	5.6		U
75-69-4	Trichlorofluoromethane	1.1	5.6		U
75-01-4	Vinyl chloride	1.2	5.6		U
1330-20-7	Xylene(total)	0.79	5.6		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-07

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0510407

Level: (low/med) LOW Date Sampled: 05/09/08 12:50

% Moisture: not dec. 22 Date Analyzed: 05/14/08 18:37

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.7	13	65	X
71-43-2	Benzene	0.63	6.7		U
74-97-5	Bromochloromethane	0.56	6.7		U
75-27-4	Bromodichloromethane	0.40	6.7		U
75-25-2	Bromoform	1.3	6.7		U
74-83-9	Bromomethane	0.96	6.7		U
78-93-3	2-Butanone	1.9	13		U
75-15-0	Carbon disulfide	1.7	6.7		U
56-23-5	Carbon tetrachloride	1.2	6.7		U
108-90-7	Chlorobenzene	0.45	6.7		U
75-00-3	Chloroethane	1.5	6.7		U
67-66-3	Chloroform	0.74	6.7		U
74-87-3	Chloromethane	0.70	6.7	0.71	J
110-82-7	Cyclohexane	0.72	6.7		U
124-48-1	Dibromochloromethane	0.45	6.7		U
96-12-8	1,2-Dibromo-3-chloropropane	1.6	6.7		U
106-93-4	1,2-Dibromoethane	0.57	6.7		U
95-50-1	1,2-Dichlorobenzene	0.49	6.7		U
541-73-1	1,3-Dichlorobenzene	1.1	6.7		U
106-46-7	1,4-Dichlorobenzene	0.74	6.7		U
75-71-8	Dichlorodifluoromethane	1.5	6.7		U
75-34-3	1,1-Dichloroethane	0.72	6.7		U
107-06-2	1,2-Dichloroethane	0.62	6.7		U
75-35-4	1,1-Dichloroethene	1.6	6.7		U
156-59-2	cis-1,2-Dichloroethene	1.6	6.7		U
156-60-5	trans-1,2-Dichloroethene	1.5	6.7		U
78-87-5	1,2-Dichloropropane	0.62	6.7		U
10061-01-5	cis-1,3-Dichloropropene	0.67	6.7		U
10061-02-6	trans-1,3-Dichloropropene	0.43	6.7		U
123-91-1	1,4-Dioxane	0.67	67		U
100-41-4	Ethylbenzene	1.0	6.7		U
591-78-6	2-Hexanone	3.1	13		U
98-82-8	Isopropylbenzene	1.2	6.7		U
79-20-9	Methyl acetate	2.1	6.7		U
108-87-2	Methyl cyclohexane	0.40	6.7		U
75-09-2	Methylene chloride	0.83	6.7	11	B
108-10-1	4-Methyl-2-pentanone	0.78	13		U
1634-04-4	Methyl-tert-butyl ether	0.43	6.7		U
100-42-5	Styrene	0.47	6.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-07

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0510407

Level: (low/med) LOW Date Sampled: 05/09/08 12:50

% Moisture: not dec. 22 Date Analyzed: 05/14/08 18:37

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.57	6.7		U
127-18-4	Tetrachloroethene	1.3	6.7		U
108-88-3	Toluene	1.1	6.7		U
87-61-6	1,2,3-Trichlorobenzene	0.56	6.7		U
120-82-1	1,2,4-Trichlorobenzene	0.24	6.7		U
71-55-6	1,1,1-Trichloroethane	1.2	6.7		U
79-00-5	1,1,2-Trichloroethane	0.47	6.7		U
79-01-6	Trichloroethene	1.1	6.7		U
76-13-1	Trichlorotrifluoroethane	0.74	6.7		U
75-69-4	Trichlorofluoromethane	1.3	6.7		U
75-01-4	Vinyl chloride	1.5	6.7		U
1330-20-7	Xylene(total)	0.94	6.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034DUP01
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-08

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0510408

Level: (low/med) LOW Date Sampled: 05/09/08 12:50

% Moisture: not dec. 23 Date Analyzed: 05/14/08 19:12

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.5	12	56	X
71-43-2	Benzene	0.59	6.2		U
74-97-5	Bromochloromethane	0.52	6.2		U
75-27-4	Bromodichloromethane	0.37	6.2		U
75-25-2	Bromoform	1.2	6.2		U
74-83-9	Bromomethane	0.90	6.2		U
78-93-3	2-Butanone	1.7	12		U
75-15-0	Carbon disulfide	1.6	6.2		U
56-23-5	Carbon tetrachloride	1.1	6.2		U
108-90-7	Chlorobenzene	0.42	6.2		U
75-00-3	Chloroethane	1.4	6.2		U
67-66-3	Chloroform	0.69	6.2		U
74-87-3	Chloromethane	0.65	6.2		U
110-82-7	Cyclohexane	0.67	6.2		U
124-48-1	Dibromochloromethane	0.42	6.2		U
96-12-8	1,2-Dibromo-3-chloropropane	1.5	6.2		U
106-93-4	1,2-Dibromoethane	0.54	6.2		U
95-50-1	1,2-Dichlorobenzene	0.46	6.2		U
541-73-1	1,3-Dichlorobenzene	1.0	6.2		U
106-46-7	1,4-Dichlorobenzene	0.69	6.2		U
75-71-8	Dichlorodifluoromethane	1.4	6.2		U
75-34-3	1,1-Dichloroethane	0.67	6.2		U
107-06-2	1,2-Dichloroethane	0.57	6.2		U
75-35-4	1,1-Dichloroethene	1.5	6.2		U
156-59-2	cis-1,2-Dichloroethene	1.5	6.2		U
156-60-5	trans-1,2-Dichloroethene	1.4	6.2		U
78-87-5	1,2-Dichloropropane	0.57	6.2		U
10061-01-5	cis-1,3-Dichloropropene	0.62	6.2		U
10061-02-6	trans-1,3-Dichloropropene	0.40	6.2		U
123-91-1	1,4-Dioxane	0.62	62		U
100-41-4	Ethylbenzene	0.94	6.2		U
591-78-6	2-Hexanone	2.9	12		U
98-82-8	Isopropylbenzene	1.1	6.2		U
79-20-9	Methyl acetate	2.0	6.2		U
108-87-2	Methyl cyclohexane	0.37	6.2		U
75-09-2	Methylene chloride	0.77	6.2	7.7	B
108-10-1	4-Methyl-2-pentanone	0.72	12		U
1634-04-4	Methyl-tert-butyl ether	0.40	6.2		U
100-42-5	Styrene	0.44	6.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034DUP01
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-08

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0510408

Level: (low/med) LOW Date Sampled: 05/09/08 12:50

% Moisture: not dec. 23 Date Analyzed: 05/14/08 19:12

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.54	6.2		U
127-18-4	Tetrachloroethene	1.2	6.2		U
108-88-3	Toluene	1.1	6.2		U
87-61-6	1,2,3-Trichlorobenzene	0.52	6.2		U
120-82-1	1,2,4-Trichlorobenzene	0.22	6.2		U
71-55-6	1,1,1-Trichloroethane	1.1	6.2		U
79-00-5	1,1,2-Trichloroethane	0.44	6.2		U
79-01-6	Trichloroethene	1.1	6.2		U
76-13-1	Trichlorotrifluoroethane	0.69	6.2		U
75-69-4	Trichlorofluoromethane	1.2	6.2		U
75-01-4	Vinyl chloride	1.4	6.2		U
1330-20-7	Xylene(total)	0.87	6.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB007
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-09

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0510409

Level: (low/med) LOW Date Sampled: 05/09/08 13:30

% Moisture: not dec. 23 Date Analyzed: 05/14/08 19:48

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.3	12		U
71-43-2	Benzene	0.54	5.8		U
74-97-5	Bromochloromethane	0.49	5.8		U
75-27-4	Bromodichloromethane	0.35	5.8		U
75-25-2	Bromoform	1.2	5.8		U
74-83-9	Bromomethane	0.84	5.8		U
78-93-3	2-Butanone	1.6	12		U
75-15-0	Carbon disulfide	1.5	5.8		U
56-23-5	Carbon tetrachloride	1.0	5.8		U
108-90-7	Chlorobenzene	0.39	5.8		U
75-00-3	Chloroethane	1.3	5.8		U
67-66-3	Chloroform	0.64	5.8		U
74-87-3	Chloromethane	0.60	5.8		U
110-82-7	Cyclohexane	0.63	5.8		U
124-48-1	Dibromochloromethane	0.39	5.8		U
96-12-8	1,2-Dibromo-3-chloropropane	1.4	5.8		U
106-93-4	1,2-Dibromoethane	0.50	5.8		U
95-50-1	1,2-Dichlorobenzene	0.43	5.8		U
541-73-1	1,3-Dichlorobenzene	0.98	5.8		U
106-46-7	1,4-Dichlorobenzene	0.64	5.8		U
75-71-8	Dichlorodifluoromethane	1.3	5.8		U
75-34-3	1,1-Dichloroethane	0.63	5.8		U
107-06-2	1,2-Dichloroethane	0.53	5.8		U
75-35-4	1,1-Dichloroethene	1.4	5.8		U
156-59-2	cis-1,2-Dichloroethene	1.4	5.8		U
156-60-5	trans-1,2-Dichloroethene	1.3	5.8		U
78-87-5	1,2-Dichloropropane	0.53	5.8		U
10061-01-5	cis-1,3-Dichloropropene	0.58	5.8		U
10061-02-6	trans-1,3-Dichloropropene	0.37	5.8		U
123-91-1	1,4-Dioxane	0.58	58		U
100-41-4	Ethylbenzene	0.87	5.8		U
591-78-6	2-Hexanone	2.7	12		U
98-82-8	Isopropylbenzene	1.0	5.8		U
79-20-9	Methyl acetate	1.8	5.8		U
108-87-2	Methyl cyclohexane	0.35	5.8		U
75-09-2	Methylene chloride	0.72	5.8	7.8	B
108-10-1	4-Methyl-2-pentanone	0.67	12		U
1634-04-4	Methyl-tert-butyl ether	0.37	5.8		U
100-42-5	Styrene	0.41	5.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB007
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-09

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0510409

Level: (low/med) LOW Date Sampled: 05/09/08 13:30

% Moisture: not dec. 23 Date Analyzed: 05/14/08 19:48

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.50	5.8		U
127-18-4	Tetrachloroethene	1.1	5.8		U
108-88-3	Toluene	1.00	5.8		U
87-61-6	1,2,3-Trichlorobenzene	0.49	5.8		U
120-82-1	1,2,4-Trichlorobenzene	0.21	5.8		U
71-55-6	1,1,1-Trichloroethane	1.0	5.8		U
79-00-5	1,1,2-Trichloroethane	0.41	5.8		U
79-01-6	Trichloroethene	0.99	5.8		U
76-13-1	Trichlorotrifluoroethane	0.64	5.8		U
75-69-4	Trichlorofluoromethane	1.1	5.8		U
75-01-4	Vinyl chloride	1.3	5.8		U
1330-20-7	Xylene(total)	0.81	5.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SSB-026 (19-20)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-10

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0510410

Level: (low/med) LOW Date Sampled: 05/09/08 14:50

% Moisture: not dec. 29 Date Analyzed: 05/14/08 20:23

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.9	15		U
71-43-2	Benzene	0.69	7.3		U
74-97-5	Bromochloromethane	0.61	7.3		U
75-27-4	Bromodichloromethane	0.44	7.3		U
75-25-2	Bromoform	1.5	7.3		U
74-83-9	Bromomethane	1.0	7.3		U
78-93-3	2-Butanone	2.0	15		U
75-15-0	Carbon disulfide	1.9	7.3		U
56-23-5	Carbon tetrachloride	1.3	7.3		U
108-90-7	Chlorobenzene	0.50	7.3		U
75-00-3	Chloroethane	1.6	7.3		U
67-66-3	Chloroform	0.80	7.3		U
74-87-3	Chloromethane	0.76	7.3		U
110-82-7	Cyclohexane	0.79	7.3		U
124-48-1	Dibromochloromethane	0.50	7.3		U
96-12-8	1,2-Dibromo-3-chloropropane	1.8	7.3		U
106-93-4	1,2-Dibromoethane	0.63	7.3		U
95-50-1	1,2-Dichlorobenzene	0.54	7.3		U
541-73-1	1,3-Dichlorobenzene	1.2	7.3		U
106-46-7	1,4-Dichlorobenzene	0.80	7.3		U
75-71-8	Dichlorodifluoromethane	1.6	7.3		U
75-34-3	1,1-Dichloroethane	0.79	7.3		U
107-06-2	1,2-Dichloroethane	0.67	7.3		U
75-35-4	1,1-Dichloroethene	1.8	7.3		U
156-59-2	cis-1,2-Dichloroethene	1.8	7.3		U
156-60-5	trans-1,2-Dichloroethene	1.6	7.3		U
78-87-5	1,2-Dichloropropane	0.67	7.3		U
10061-01-5	cis-1,3-Dichloropropene	0.73	7.3		U
10061-02-6	trans-1,3-Dichloropropene	0.47	7.3		U
123-91-1	1,4-Dioxane	0.73	73		U
100-41-4	Ethylbenzene	1.1	7.3		U
591-78-6	2-Hexanone	3.4	15		U
98-82-8	Isopropylbenzene	1.3	7.3		U
79-20-9	Methyl acetate	2.3	7.3		U
108-87-2	Methyl cyclohexane	0.44	7.3		U
75-09-2	Methylene chloride	0.91	7.3	10	B
108-10-1	4-Methyl-2-pentanone	0.85	15		U
1634-04-4	Methyl-tert-butyl ether	0.47	7.3		U
100-42-5	Styrene	0.51	7.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SSB-026 (19-20)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-10

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0510410

Level: (low/med) LOW Date Sampled: 05/09/08 14:50

% Moisture: not dec. 29 Date Analyzed: 05/14/08 20:23

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.63	7.3		U
127-18-4	Tetrachloroethene	1.4	7.3		U
108-88-3	Toluene	1.2	7.3		U
87-61-6	1,2,3-Trichlorobenzene	0.61	7.3		U
120-82-1	1,2,4-Trichlorobenzene	0.26	7.3		U
71-55-6	1,1,1-Trichloroethane	1.3	7.3		U
79-00-5	1,1,2-Trichloroethane	0.51	7.3		U
79-01-6	Trichloroethene	1.2	7.3		U
76-13-1	Trichlorotrifluoroethane	0.80	7.3		U
75-69-4	Trichlorofluoromethane	1.4	7.3		U
75-01-4	Vinyl chloride	1.6	7.3		U
1330-20-7	Xylene(total)	1.0	7.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SSB-025 (19-20)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-11

Sample wt/vol: 5.7 (g/mL) G Lab File ID: 0510411

Level: (low/med) LOW Date Sampled: 05/09/08 15:30

% Moisture: not dec. 17 Date Analyzed: 05/14/08 20:58

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.1	10	8.8	J
71-43-2	Benzene	0.49	5.3		U
74-97-5	Bromochloromethane	0.44	5.3		U
75-27-4	Bromodichloromethane	0.32	5.3		U
75-25-2	Bromoform	1.0	5.3		U
74-83-9	Bromomethane	0.76	5.3		U
78-93-3	2-Butanone	1.5	10		U
75-15-0	Carbon disulfide	1.4	5.3		U
56-23-5	Carbon tetrachloride	0.93	5.3		U
108-90-7	Chlorobenzene	0.36	5.3		U
75-00-3	Chloroethane	1.2	5.3		U
67-66-3	Chloroform	0.58	5.3		U
74-87-3	Chloromethane	0.55	5.3		U
110-82-7	Cyclohexane	0.57	5.3		U
124-48-1	Dibromochloromethane	0.36	5.3		U
96-12-8	1,2-Dibromo-3-chloropropane	1.3	5.3		U
106-93-4	1,2-Dibromoethane	0.45	5.3		U
95-50-1	1,2-Dichlorobenzene	0.39	5.3		U
541-73-1	1,3-Dichlorobenzene	0.88	5.3		U
106-46-7	1,4-Dichlorobenzene	0.58	5.3		U
75-71-8	Dichlorodifluoromethane	1.2	5.3		U
75-34-3	1,1-Dichloroethane	0.57	5.3		U
107-06-2	1,2-Dichloroethane	0.48	5.3		U
75-35-4	1,1-Dichloroethene	1.3	5.3		U
156-59-2	cis-1,2-Dichloroethene	1.3	5.3		U
156-60-5	trans-1,2-Dichloroethene	1.2	5.3		U
78-87-5	1,2-Dichloropropane	0.48	5.3		U
10061-01-5	cis-1,3-Dichloropropene	0.53	5.3		U
10061-02-6	trans-1,3-Dichloropropene	0.34	5.3		U
123-91-1	1,4-Dioxane	0.53	53		U
100-41-4	Ethylbenzene	0.79	5.3		U
591-78-6	2-Hexanone	2.4	10		U
98-82-8	Isopropylbenzene	0.93	5.3		U
79-20-9	Methyl acetate	1.7	5.3		U
108-87-2	Methyl cyclohexane	0.32	5.3		U
75-09-2	Methylene chloride	0.65	5.3	7.6	B
108-10-1	4-Methyl-2-pentanone	0.61	10		U
1634-04-4	Methyl-tert-butyl ether	0.34	5.3		U
100-42-5	Styrene	0.37	5.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SSB-025 (19-20)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-11

Sample wt/vol: 5.7 (g/mL) G Lab File ID: 0510411

Level: (low/med) LOW Date Sampled: 05/09/08 15:30

% Moisture: not dec. 17 Date Analyzed: 05/14/08 20:58

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.45	5.3		U
127-18-4	Tetrachloroethene	1.0	5.3		U
108-88-3	Toluene	0.90	5.3		U
87-61-6	1,2,3-Trichlorobenzene	0.44	5.3		U
120-82-1	1,2,4-Trichlorobenzene	0.19	5.3		U
71-55-6	1,1,1-Trichloroethane	0.95	5.3		U
79-00-5	1,1,2-Trichloroethane	0.37	5.3		U
79-01-6	Trichloroethene	0.90	5.3		U
76-13-1	Trichlorotrifluoroethane	0.58	5.3		U
75-69-4	Trichlorofluoromethane	1.0	5.3		U
75-01-4	Vinyl chloride	1.2	5.3		U
1330-20-7	Xylene(total)	0.74	5.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SSB-021 (23-24)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-12

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 0510412

Level: (low/med) LOW Date Sampled: 05/09/08 16:30

% Moisture: not dec. 31 Date Analyzed: 05/14/08 21:34

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.9	14		U
71-43-2	Benzene	0.68	7.2		U
74-97-5	Bromochloromethane	0.61	7.2		U
75-27-4	Bromodichloromethane	0.43	7.2		U
75-25-2	Bromoform	1.4	7.2		U
74-83-9	Bromomethane	1.0	7.2		U
78-93-3	2-Butanone	2.0	14		U
75-15-0	Carbon disulfide	1.9	7.2		U
56-23-5	Carbon tetrachloride	1.3	7.2		U
108-90-7	Chlorobenzene	0.49	7.2		U
75-00-3	Chloroethane	1.6	7.2		U
67-66-3	Chloroform	0.80	7.2		U
74-87-3	Chloromethane	0.75	7.2		U
110-82-7	Cyclohexane	0.78	7.2		U
124-48-1	Dibromochloromethane	0.49	7.2		U
96-12-8	1,2-Dibromo-3-chloropropane	1.7	7.2		U
106-93-4	1,2-Dibromoethane	0.62	7.2		U
95-50-1	1,2-Dichlorobenzene	0.54	7.2		U
541-73-1	1,3-Dichlorobenzene	1.2	7.2		U
106-46-7	1,4-Dichlorobenzene	0.80	7.2		U
75-71-8	Dichlorodifluoromethane	1.6	7.2		U
75-34-3	1,1-Dichloroethane	0.78	7.2		U
107-06-2	1,2-Dichloroethane	0.66	7.2		U
75-35-4	1,1-Dichloroethene	1.7	7.2		U
156-59-2	cis-1,2-Dichloroethene	1.7	7.2		U
156-60-5	trans-1,2-Dichloroethene	1.6	7.2		U
78-87-5	1,2-Dichloropropane	0.66	7.2		U
10061-01-5	cis-1,3-Dichloropropene	0.72	7.2		U
10061-02-6	trans-1,3-Dichloropropene	0.46	7.2		U
123-91-1	1,4-Dioxane	0.72	72		U
100-41-4	Ethylbenzene	1.1	7.2		U
591-78-6	2-Hexanone	3.3	14		U
98-82-8	Isopropylbenzene	1.3	7.2		U
79-20-9	Methyl acetate	2.3	7.2		U
108-87-2	Methyl cyclohexane	0.43	7.2		U
75-09-2	Methylene chloride	0.90	7.2	9.8	B
108-10-1	4-Methyl-2-pentanone	0.84	14		U
1634-04-4	Methyl-tert-butyl ether	0.46	7.2		U
100-42-5	Styrene	0.51	7.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SSB-021 (23-24)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-12

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 0510412

Level: (low/med) LOW Date Sampled: 05/09/08 16:30

% Moisture: not dec. 31 Date Analyzed: 05/14/08 21:34

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.62	7.2		U
127-18-4	Tetrachloroethene	1.4	7.2		U
108-88-3	Toluene	1.2	7.2		U
87-61-6	1,2,3-Trichlorobenzene	0.61	7.2		U
120-82-1	1,2,4-Trichlorobenzene	0.26	7.2		U
71-55-6	1,1,1-Trichloroethane	1.3	7.2		U
79-00-5	1,1,2-Trichloroethane	0.51	7.2		U
79-01-6	Trichloroethene	1.2	7.2	1.9	J
76-13-1	Trichlorotrifluoroethane	0.80	7.2		U
75-69-4	Trichlorofluoromethane	1.4	7.2		U
75-01-4	Vinyl chloride	1.6	7.2		U
1330-20-7	Xylene(total)	1.0	7.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-01

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0510501A

Level: (low/med) LOW Date Sampled: 05/09/08 10:46

% Moisture: not dec. 33 Date Analyzed: 05/20/08 21:56

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.4	15		U
71-43-2	Benzene	0.29	7.7		U
74-97-5	Bromochloromethane	0.54	7.7		U
75-27-4	Bromodichloromethane	0.34	7.7		U
75-25-2	Bromoform	0.90	7.7		U
74-83-9	Bromomethane	0.63	7.7		U
78-93-3	2-Butanone	3.0	15		U
75-15-0	Carbon disulfide	0.41	7.7		U
56-23-5	Carbon tetrachloride	0.37	7.7		U
108-90-7	Chlorobenzene	0.50	7.7		U
75-00-3	Chloroethane	0.61	7.7		U
67-66-3	Chloroform	0.66	7.7		U
74-87-3	Chloromethane	0.55	7.7	0.76	JB
110-82-7	Cyclohexane	0.64	7.7		U
124-48-1	Dibromochloromethane	0.37	7.7		U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	7.7		U
106-93-4	1,2-Dibromoethane	0.86	7.7		U
95-50-1	1,2-Dichlorobenzene	0.35	7.7		U
541-73-1	1,3-Dichlorobenzene	0.35	7.7		U
106-46-7	1,4-Dichlorobenzene	0.28	7.7		U
75-71-8	Dichlorodifluoromethane	0.46	7.7		U
75-34-3	1,1-Dichloroethane	0.63	7.7		U
107-06-2	1,2-Dichloroethane	0.66	7.7		U
75-35-4	1,1-Dichloroethene	0.49	7.7		U
156-59-2	cis-1,2-Dichloroethene	0.41	7.7		U
156-60-5	trans-1,2-Dichloroethene	0.84	7.7		U
78-87-5	1,2-Dichloropropane	0.87	7.7		U
10061-01-5	cis-1,3-Dichloropropene	0.54	7.7		U
10061-02-6	trans-1,3-Dichloropropene	0.57	7.7		U
123-91-1	1,4-Dioxane	0.77	77		UY
100-41-4	Ethylbenzene	0.37	7.7		U
591-78-6	2-Hexanone	0.93	15		U
98-82-8	Isopropylbenzene	0.40	7.7		U
79-20-9	Methyl acetate	0.87	7.7		U
108-87-2	Methyl cyclohexane	0.60	7.7		U
75-09-2	Methylene chloride	1.6	7.7	16	B
108-10-1	4-Methyl-2-pentanone	0.92	15		U
1634-04-4	Methyl-tert-butyl ether	0.87	7.7		U
100-42-5	Styrene	0.52	7.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-01

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0510501A

Level: (low/med) LOW Date Sampled: 05/09/08 10:46

% Moisture: not dec. 33 Date Analyzed: 05/20/08 21:56

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.49	7.7		U
127-18-4	Tetrachloroethene	0.32	7.7		U
108-88-3	Toluene	0.58	7.7	0.70	J
87-61-6	1,2,3-Trichlorobenzene	0.29	7.7		U
120-82-1	1,2,4-Trichlorobenzene	0.47	7.7		U
71-55-6	1,1,1-Trichloroethane	0.52	7.7		U
79-00-5	1,1,2-Trichloroethane	0.75	7.7		U
79-01-6	Trichloroethene	0.63	7.7	1.1	J
76-13-1	Trichlorotrifluoroethane	0.55	7.7		U
75-69-4	Trichlorofluoromethane	0.63	7.7		U
75-01-4	Vinyl chloride	0.72	7.7		U
1330-20-7	Xylene(total)	0.32	7.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-02

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0510502A

Level: (low/med) LOW Date Sampled: 05/09/08 12:25

% Moisture: not dec. 34 Date Analyzed: 05/20/08 22:27

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.5	16		U
71-43-2	Benzene	0.30	8.0		U
74-97-5	Bromochloromethane	0.56	8.0		U
75-27-4	Bromodichloromethane	0.35	8.0		U
75-25-2	Bromoform	0.95	8.0		U
74-83-9	Bromomethane	0.66	8.0		U
78-93-3	2-Butanone	3.2	16		U
75-15-0	Carbon disulfide	0.43	8.0		U
56-23-5	Carbon tetrachloride	0.39	8.0		U
108-90-7	Chlorobenzene	0.53	8.0		U
75-00-3	Chloroethane	0.64	8.0		U
67-66-3	Chloroform	0.69	8.0		U
74-87-3	Chloromethane	0.58	8.0		U
110-82-7	Cyclohexane	0.68	8.0		U
124-48-1	Dibromochloromethane	0.39	8.0		U
96-12-8	1,2-Dibromo-3-chloropropane	1.1	8.0		U
106-93-4	1,2-Dibromoethane	0.90	8.0		U
95-50-1	1,2-Dichlorobenzene	0.37	8.0		U
541-73-1	1,3-Dichlorobenzene	0.37	8.0		U
106-46-7	1,4-Dichlorobenzene	0.29	8.0		U
75-71-8	Dichlorodifluoromethane	0.48	8.0		U
75-34-3	1,1-Dichloroethane	0.66	8.0		U
107-06-2	1,2-Dichloroethane	0.69	8.0		U
75-35-4	1,1-Dichloroethene	0.52	8.0		U
156-59-2	cis-1,2-Dichloroethene	0.43	8.0		U
156-60-5	trans-1,2-Dichloroethene	0.88	8.0		U
78-87-5	1,2-Dichloropropane	0.92	8.0		U
10061-01-5	cis-1,3-Dichloropropene	0.56	8.0		U
10061-02-6	trans-1,3-Dichloropropene	0.60	8.0		U
123-91-1	1,4-Dioxane	0.80	80		UY
100-41-4	Ethylbenzene	0.39	8.0		U
591-78-6	2-Hexanone	0.98	16		U
98-82-8	Isopropylbenzene	0.42	8.0		U
79-20-9	Methyl acetate	0.92	8.0		U
108-87-2	Methyl cyclohexane	0.63	8.0		U
75-09-2	Methylene chloride	1.7	8.0	20	B
108-10-1	4-Methyl-2-pentanone	0.96	16		U
1634-04-4	Methyl-tert-butyl ether	0.92	8.0		U
100-42-5	Styrene	0.55	8.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-02

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0510502A

Level: (low/med) LOW Date Sampled: 05/09/08 12:25

% Moisture: not dec. 34 Date Analyzed: 05/20/08 22:27

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.52	8.0		U
127-18-4	Tetrachloroethene	0.34	8.0		U
108-88-3	Toluene	0.61	8.0		U
87-61-6	1,2,3-Trichlorobenzene	0.30	8.0		U
120-82-1	1,2,4-Trichlorobenzene	0.50	8.0		U
71-55-6	1,1,1-Trichloroethane	0.55	8.0		U
79-00-5	1,1,2-Trichloroethane	0.79	8.0		U
79-01-6	Trichloroethene	0.66	8.0		U
76-13-1	Trichlorotrifluoroethane	0.58	8.0		U
75-69-4	Trichlorofluoromethane	0.66	8.0		U
75-01-4	Vinyl chloride	0.76	8.0		U
1330-20-7	Xylene(total)	0.34	8.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-03

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 0510503A

Level: (low/med) LOW Date Sampled: 05/09/08 13:00

% Moisture: not dec. 20 Date Analyzed: 05/20/08 22:58

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
67-64-1	Acetone	2.4	16		U
71-43-2	Benzene	0.30	7.8		U
74-97-5	Bromochloromethane	0.55	7.8		U
75-27-4	Bromodichloromethane	0.34	7.8		U
75-25-2	Bromoform	0.92	7.8		U
74-83-9	Bromomethane	0.64	7.8		U
78-93-3	2-Butanone	3.0	16		U
75-15-0	Carbon disulfide	0.42	7.8		U
56-23-5	Carbon tetrachloride	0.37	7.8		U
108-90-7	Chlorobenzene	0.51	7.8		U
75-00-3	Chloroethane	0.62	7.8		U
67-66-3	Chloroform	0.67	7.8		U
74-87-3	Chloromethane	0.56	7.8		U
110-82-7	Cyclohexane	0.66	7.8		U
124-48-1	Dibromochloromethane	0.37	7.8		U
96-12-8	1,2-Dibromo-3-chloropropane	1.1	7.8		U
106-93-4	1,2-Dibromoethane	0.87	7.8		U
95-50-1	1,2-Dichlorobenzene	0.36	7.8		U
541-73-1	1,3-Dichlorobenzene	0.36	7.8		U
106-46-7	1,4-Dichlorobenzene	0.28	7.8		U
75-71-8	Dichlorodifluoromethane	0.47	7.8		U
75-34-3	1,1-Dichloroethane	0.64	7.8		U
107-06-2	1,2-Dichloroethane	0.67	7.8		U
75-35-4	1,1-Dichloroethene	0.50	7.8		U
156-59-2	cis-1,2-Dichloroethene	0.42	7.8		U
156-60-5	trans-1,2-Dichloroethene	0.86	7.8		U
78-87-5	1,2-Dichloropropane	0.89	7.8		U
10061-01-5	cis-1,3-Dichloropropene	0.55	7.8		U
10061-02-6	trans-1,3-Dichloropropene	0.58	7.8		U
123-91-1	1,4-Dioxane	0.78	78		UY
100-41-4	Ethylbenzene	0.37	7.8		U
591-78-6	2-Hexanone	0.95	16		U
98-82-8	Isopropylbenzene	0.40	7.8		U
79-20-9	Methyl acetate	0.89	7.8		U
108-87-2	Methyl cyclohexane	0.61	7.8		U
75-09-2	Methylene chloride	1.7	7.8	17	B
108-10-1	4-Methyl-2-pentanone	0.94	16		U
1634-04-4	Methyl-tert-butyl ether	0.89	7.8		U
100-42-5	Styrene	0.53	7.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-03

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 0510503A

Level: (low/med) LOW Date Sampled: 05/09/08 13:00

% Moisture: not dec. 20 Date Analyzed: 05/20/08 22:58

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.50	7.8		U
127-18-4	Tetrachloroethene	0.33	7.8		U
108-88-3	Toluene	0.59	7.8		U
87-61-6	1,2,3-Trichlorobenzene	0.30	7.8		U
120-82-1	1,2,4-Trichlorobenzene	0.48	7.8		U
71-55-6	1,1,1-Trichloroethane	0.53	7.8		U
79-00-5	1,1,2-Trichloroethane	0.76	7.8		U
79-01-6	Trichloroethene	0.64	7.8		U
76-13-1	Trichlorotrifluoroethane	0.56	7.8		U
75-69-4	Trichlorofluoromethane	0.64	7.8		U
75-01-4	Vinyl chloride	0.73	7.8		U
1330-20-7	Xylene(total)	0.33	7.8		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-04

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0510504A

Level: (low/med) LOW Date Sampled: 05/09/08 13:40

% Moisture: not dec. 10 Date Analyzed: 05/20/08 23:29

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.8	12		U
71-43-2	Benzene	0.22	5.9		U
74-97-5	Bromochloromethane	0.41	5.9		U
75-27-4	Bromodichloromethane	0.26	5.9		U
75-25-2	Bromoform	0.69	5.9		U
74-83-9	Bromomethane	0.48	5.9		U
78-93-3	2-Butanone	2.3	12		U
75-15-0	Carbon disulfide	0.32	5.9		U
56-23-5	Carbon tetrachloride	0.28	5.9		U
108-90-7	Chlorobenzene	0.39	5.9		U
75-00-3	Chloroethane	0.47	5.9		U
67-66-3	Chloroform	0.50	5.9		U
74-87-3	Chloromethane	0.42	5.9		U
110-82-7	Cyclohexane	0.49	5.9		U
124-48-1	Dibromochloromethane	0.28	5.9		U
96-12-8	1,2-Dibromo-3-chloropropane	0.80	5.9		U
106-93-4	1,2-Dibromoethane	0.66	5.9		U
95-50-1	1,2-Dichlorobenzene	0.27	5.9		U
541-73-1	1,3-Dichlorobenzene	0.27	5.9		U
106-46-7	1,4-Dichlorobenzene	0.21	5.9		U
75-71-8	Dichlorodifluoromethane	0.35	5.9		U
75-34-3	1,1-Dichloroethane	0.48	5.9		U
107-06-2	1,2-Dichloroethane	0.50	5.9		U
75-35-4	1,1-Dichloroethene	0.38	5.9		U
156-59-2	cis-1,2-Dichloroethene	0.32	5.9		U
156-60-5	trans-1,2-Dichloroethene	0.65	5.9		U
78-87-5	1,2-Dichloropropane	0.67	5.9		U
10061-01-5	cis-1,3-Dichloropropene	0.41	5.9		U
10061-02-6	trans-1,3-Dichloropropene	0.43	5.9		U
123-91-1	1,4-Dioxane	0.59	59		UY
100-41-4	Ethylbenzene	0.28	5.9		U
591-78-6	2-Hexanone	0.72	12		U
98-82-8	Isopropylbenzene	0.30	5.9		U
79-20-9	Methyl acetate	0.67	5.9		U
108-87-2	Methyl cyclohexane	0.46	5.9		U
75-09-2	Methylene chloride	1.3	5.9	18	B
108-10-1	4-Methyl-2-pentanone	0.70	12		U
1634-04-4	Methyl-tert-butyl ether	0.67	5.9		U
100-42-5	Styrene	0.40	5.9		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-04

Sample wt/vol: 4.7 (g/mL) G Lab File ID: 0510504A

Level: (low/med) LOW Date Sampled: 05/09/08 13:40

% Moisture: not dec. 10 Date Analyzed: 05/20/08 23:29

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.38	5.9		U
127-18-4	Tetrachloroethene	0.25	5.9		U
108-88-3	Toluene	0.45	5.9		U
87-61-6	1,2,3-Trichlorobenzene	0.22	5.9		U
120-82-1	1,2,4-Trichlorobenzene	0.36	5.9		U
71-55-6	1,1,1-Trichloroethane	0.40	5.9		U
79-00-5	1,1,2-Trichloroethane	0.58	5.9		U
79-01-6	Trichloroethene	0.48	5.9		U
76-13-1	Trichlorotrifluoroethane	0.42	5.9		U
75-69-4	Trichlorofluoromethane	0.48	5.9		U
75-01-4	Vinyl chloride	0.55	5.9		U
1330-20-7	Xylene(total)	0.25	5.9		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP-HP021
(05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511501

Level: (low/med) LOW Date Sampled: 05/10/08 07:50

% Moisture: not dec. _____ Date Analyzed: 05/15/08 21:01

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	5.2	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP-HP021
(05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511501

Level: (low/med) LOW Date Sampled: 05/10/08 07:50

% Moisture: not dec. _____ Date Analyzed: 05/15/08 21:01

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0	0.32	J
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP-HP026
(05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511502

Level: (low/med) LOW Date Sampled: 05/10/08 08:15

% Moisture: not dec. _____ Date Analyzed: 05/15/08 21:30

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	2.0	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP-HP026
(05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511502

Level: (low/med) LOW Date Sampled: 05/10/08 08:15

% Moisture: not dec. _____ Date Analyzed: 05/15/08 21:30

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP-HP025
(05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511503

Level: (low/med) LOW Date Sampled: 05/10/08 08:40

% Moisture: not dec. _____ Date Analyzed: 05/15/08 22:00

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	2.0	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	0.46	J
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP-HP025
(05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511503

Level: (low/med) LOW Date Sampled: 05/10/08 08:40

% Moisture: not dec. _____ Date Analyzed: 05/15/08 22:00

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0	4.8	
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549 HP00
8 (05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511504

Level: (low/med) LOW Date Sampled: 05/10/08 09:15

% Moisture: not dec. _____ Date Analyzed: 05/15/08 22:29

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	2.0	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	3.9	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549 HP00
8 (05102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511504

Level: (low/med) LOW Date Sampled: 05/10/08 09:15

% Moisture: not dec. _____ Date Analyzed: 05/15/08 22:29

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB001 (0 5102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511506

Level: (low/med) LOW Date Sampled: 05/10/08 12:00

% Moisture: not dec. _____ Date Analyzed: 05/15/08 20:31

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	1.8	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0	0.45	J
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	1.4	B
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB001 (0 5102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511506

Level: (low/med) LOW Date Sampled: 05/10/08 12:00

% Moisture: not dec. _____ Date Analyzed: 05/15/08 20:31

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
TB-4 (051 02008-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511505

Level: (low/med) LOW Date Sampled: 05/10/08 :

% Moisture: not dec. _____ Date Analyzed: 05/15/08 19:03

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	3.4	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0	0.20	J
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	0.84	J
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.63	JB
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-4 (051 02008-01)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0511505

Level: (low/med) LOW Date Sampled: 05/10/08 :

% Moisture: not dec. _____ Date Analyzed: 05/15/08 19:03

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Level: (low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V1BLK0514LCS	99	105	96	99	0
02	V1BLK0514	103	92	96	98	0
03	1041SB003 (0	97	98	94	98	0
04	1041SB001 (0	102	103	94	98	0
05	1034SB006 (0	101	104	96	99	0
06	1034DUP01 (0	97	97	94	95	0
07	1034SB007 (0	103	98	93	98	0
08	SSB-026 (19-	100	97	98	100	0
09	SSB-025 (19-	102	92	93	98	0
10	SSB-021 (23-	102	100	92	97	0
11	V5BLK0520ELC	101	101	97	100	0
12	V5BLK0520E	92	108	98	102	0
13	1041SB003 (7	93	108	106	104	0
14	1041SB001 (7	97	119	104	99	0
15	1034SB006 (7	98	116	102	97	0
16	1034SB007 (7	94	112	108	107	0
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29						
30						

		EL QC LIMITS	SPIKE CONC (ug/Kg)
SMC1 (DFM)	= Dibromofluoromethane	(80-125)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(75-140)	30
SMC3 (TOL)	= Toluene-d8	(80-120)	30
SMC4 (BFB)	= Bromofluorobenzene	(80-125)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V4BLK0514LCS	100	92	101	100	0
02	V4BLK0514	98	94	103	103	0
03	TB-4 (050908	99	94	112	110	0
04	1041HP004 (0	99	94	106	103	0
05	1041HP001 (0	100	90	110	103	0
06	1041HP003 (0	98	93	110	106	0
07	V4BLK0514LCS	101	92	94	104	0
08	V4BLK0515LCS	97	92	104	105	0
09	V4BLK0515	103	93	106	107	0
10	TB-4 (051020	98	95	104	105	0
11	EB001 (05102	100	88	103	101	0
12	5GP-HP021 (0	102	90	106	104	0
13	5GP-HP026 (0	100	92	103	105	0
14	5GP-HP025 (0	105	96	103	105	0
15	1549 HP008 (	102	94	101	96	0
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30						

		EL QC LIMITS	SPIKE CONC (ug/L)
SMC1 (DFM)	= Dibromofluoromethane	(85-120)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(80-135)	30
SMC3 (TOL)	= Toluene-d8	(85-115)	30
SMC4 (BFB)	= Bromofluorobenzene	(85-120)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V1BLK0514 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	105.4	105	20-160
Benzene	50.00	0.0000	45.34	91	75-125
Bromochloromethane	50.00	0.0000	38.10	76	70-125
Bromodichloromethane	50.00	0.0000	46.88	94	70-130
Bromoform	50.00	0.0000	41.21	82	55-135
Bromomethane	50.00	0.0000	42.27	84	30-160
2-Butanone	100.0	0.0000	175.8	176*	30-160
Carbon disulfide	50.00	0.0000	49.37	99	45-160
Carbon tetrachloride	50.00	0.0000	43.81	88	65-135
Chlorobenzene	50.00	0.0000	40.10	80	75-125
Chloroethane	50.00	0.0000	51.27	102	40-155
Chloroform	50.00	0.0000	44.89	90	70-125
Chloromethane	50.00	0.0000	61.36	123	50-130
Cyclohexane	50.00	0.0000	48.83	98	65-140
Dibromochloromethane	50.00	0.0000	40.41	81	65-130
1,2-Dibromo-3-chloropro	50.00	0.0000	41.66	83	40-135
1,2-Dibromoethane	50.00	0.0000	43.11	86	70-125
1,2-Dichlorobenzene	50.00	0.0000	42.20	84	75-120
1,3-Dichlorobenzene	50.00	0.0000	44.84	90	70-125
1,4-Dichlorobenzene	50.00	0.0000	37.87	76	70-125
Dichlorodifluoromethane	50.00	0.0000	56.02	112	35-135
1,1-Dichloroethane	50.00	0.0000	48.38	97	75-125
1,2-Dichloroethane	50.00	0.0000	51.57	103	70-125
1,1-Dichloroethene	50.00	0.0000	41.37	83	65-135
cis-1,2-Dichloroethene	50.00	0.0000	41.06	82	65-125
trans-1,2-Dichloroethen	50.00	0.0000	40.05	80	65-135
1,2-Dichloropropane	50.00	0.0000	48.28	96	70-120
cis-1,3-Dichloropropene	50.00	0.0000	45.84	92	70-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

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FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V1BLK0514 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	47.84	96	65-125
1,4-Dioxane	1000	0.0000	820.6	82	50-150
Ethylbenzene	50.00	0.0000	40.78	82	75-125
2-Hexanone	100.0	0.0000	97.80	98	45-145
Isopropylbenzene	50.00	0.0000	42.89	86	75-130
Methyl acetate	50.00	0.0000	70.90	142	45-265
Methyl cyclohexane	50.00	0.0000	46.33	93	65-135
Methylene chloride	50.00	2.817	39.31	73	55-140
4-Methyl-2-pentanone	100.0	0.0000	107.0	107	45-145
Methyl-tert-butyl ether	50.00	0.0000	44.83	90	55-150
Styrene	50.00	0.0000	41.15	82	75-125
1,1,2,2-Tetrachloroetha	50.00	0.0000	45.31	91	55-130
Tetrachloroethene	55.00	0.0000	42.06	76	65-140
Toluene	50.00	0.0000	41.73	83	70-125
1,2,3-Trichlorobenzene	50.00	0.0000	41.38	83	60-135
1,2,4-Trichlorobenzene	50.00	0.0000	40.60	81	65-130
1,1,1-Trichloroethane	50.00	0.0000	44.92	90	70-135
1,1,2-Trichloroethane	50.00	0.0000	42.90	86	60-125
Trichloroethene	50.00	0.0000	50.96	102	75-125
Trichlorotrifluoroethan	50.00	0.0000	42.95	86	60-140
Trichlorofluoromethane	50.00	0.0000	46.42	93	25-185
Vinyl chloride	50.00	0.0000	53.61	107	60-125
Xylene(total)	150.0	0.0000	119.4	80	70-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 1 out of 51 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	70.94	71	40-140
Benzene	50.00	0.0000	46.84	94	80-120
Bromochloromethane	50.00	0.0000	48.78	98	65-130
Bromodichloromethane	50.00	0.0000	45.61	91	75-120
Bromoform	50.00	0.0000	50.93	102	70-130
Bromomethane	50.00	0.0000	35.33	71	30-145
2-Butanone	100.0	0.0000	126.2	126	30-150
Carbon disulfide	50.00	0.0000	49.37	99	35-160
Carbon tetrachloride	50.00	0.0000	48.40	97	65-140
Chlorobenzene	50.00	0.0000	51.48	103	80-120
Chloroethane	50.00	0.0000	47.46	95	60-135
Chloroform	50.00	0.0000	42.46	85	65-135
Chloromethane	50.00	0.0000	51.72	103	40-125
Cyclohexane	50.00	0.0000	45.52	91	60-130
Dibromochloromethane	50.00	0.0000	53.95	108	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	48.84	98	50-130
1,2-Dibromoethane	50.00	0.0000	48.52	97	80-120
1,2-Dichlorobenzene	50.00	0.0000	49.40	99	70-120
1,3-Dichlorobenzene	50.00	0.0000	51.46	103	75-125
1,4-Dichlorobenzene	50.00	0.0000	50.20	100	75-125
Dichlorodifluoromethane	50.00	0.0000	65.15	130	30-155
1,1-Dichloroethane	50.00	0.0000	42.19	84	70-135
1,2-Dichloroethane	50.00	0.0000	43.48	87	70-130
1,1-Dichloroethene	50.00	0.0000	46.49	93	70-130
cis-1,2-Dichloroethene	50.00	0.0000	46.41	93	70-125
trans-1,2-Dichloroethen	50.00	0.0000	47.18	94	60-140
1,2-Dichloropropane	50.00	0.0000	44.55	89	75-125
cis-1,3-Dichloropropene	50.00	0.0000	45.75	92	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	50.83	102	55-140
1,4-Dioxane	1000	0.0000	854.8	85	50-150
Ethylbenzene	50.00	0.0000	50.13	100	75-125
2-Hexanone	100.0	0.0000	82.07	82	55-130
Isopropylbenzene	50.00	0.0000	57.28	114	75-125
Methyl acetate	50.00	0.0000	48.23	96	55-150
Methyl cyclohexane	50.00	0.0000	47.02	94	60-125
Methylene chloride	50.00	0.6711	45.81	90	55-140
4-Methyl-2-pentanone	100.0	0.0000	82.76	83	60-135
Methyl-tert-butyl ether	50.00	0.0000	43.35	87	65-125
Styrene	50.00	0.0000	55.62	111	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	44.02	88	65-130
Tetrachloroethene	55.00	0.0000	57.53	105	45-150
Toluene	50.00	0.0000	50.46	101	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	47.62	95	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	47.66	95	65-135
1,1,1-Trichloroethane	50.00	0.0000	44.93	90	65-130
1,1,2-Trichloroethane	50.00	0.0000	48.16	96	75-125
Trichloroethene	50.00	0.0000	46.50	93	70-125
Trichlorotrifluoroethan	50.00	0.0000	51.08	102	60-130
Trichlorofluoromethane	50.00	0.0000	49.66	99	60-145
Vinyl chloride	50.00	0.0000	47.90	96	50-145
Xylene(total)	150.0	0.0000	150.7	100	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acetone	100.0	81.13	81	13	30	40-140
Benzene	50.00	44.38	89	5	30	80-120
Bromochloromethane	50.00	43.34	87	12	30	65-130
Bromodichloromethane	50.00	50.77	102	11	30	75-120
Bromoform	50.00	47.17	94	8	30	70-130
Bromomethane	50.00	27.30	55	26	30	30-145
2-Butanone	100.0	144.1	144	13	30	30-150
Carbon disulfide	50.00	46.90	94	5	30	35-160
Carbon tetrachloride	50.00	49.57	99	2	30	65-140
Chlorobenzene	50.00	44.93	90	14	30	80-120
Chloroethane	50.00	45.64	91	4	30	60-135
Chloroform	50.00	47.40	95	11	30	65-135
Chloromethane	50.00	67.15	134*	26	30	40-125
Cyclohexane	50.00	46.54	93	2	30	60-130
Dibromochloromethane	50.00	47.73	95	12	30	60-135
1,2-Dibromo-3-chloropro	50.00	50.64	101	4	30	50-130
1,2-Dibromoethane	50.00	45.76	92	6	30	80-120
1,2-Dichlorobenzene	50.00	47.73	95	3	30	70-120
1,3-Dichlorobenzene	50.00	48.80	98	5	30	75-125
1,4-Dichlorobenzene	50.00	48.65	97	3	30	75-125
Dichlorodifluoromethane	50.00	71.45	143	9	30	30-155
1,1-Dichloroethane	50.00	43.36	87	3	30	70-135
1,2-Dichloroethane	50.00	51.12	102	16	30	70-130
1,1-Dichloroethene	50.00	42.56	85	9	30	70-130
cis-1,2-Dichloroethene	50.00	43.70	87	6	30	70-125
trans-1,2-Dichloroethen	50.00	42.78	86	10	30	60-140
1,2-Dichloropropane	50.00	46.89	94	5	30	75-125
cis-1,3-Dichloropropene	50.00	45.98	92	0	30	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V4BLK0514

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
trans-1,3-Dichloroprope	50.00	50.25	100	1	30	55-140
1,4-Dioxane	1000	843.1	84	1	30	50-150
Ethylbenzene	50.00	49.60	99	1	30	75-125
2-Hexanone	100.0	95.40	95	15	30	55-130
Isopropylbenzene	50.00	53.75	108	6	30	75-125
Methyl acetate	50.00	60.72	121	23	30	55-150
Methyl cyclohexane	50.00	45.31	91	4	30	60-125
Methylene chloride	50.00	45.49	90	1	30	55-140
4-Methyl-2-pentanone	100.0	108.6	109	27	30	60-135
Methyl-tert-butyl ether	50.00	43.27	86	0	30	65-125
Styrene	50.00	50.71	101	9	30	65-135
1,1,2,2-Tetrachloroetha	50.00	48.21	96	9	30	65-130
Tetrachloroethene	55.00	47.42	86	19	30	45-150
Toluene	50.00	45.36	91	11	30	75-120
1,2,3-Trichlorobenzene	50.00	48.57	97	2	30	55-140
1,2,4-Trichlorobenzene	50.00	46.95	94	2	30	65-135
1,1,1-Trichloroethane	50.00	49.11	98	9	30	65-130
1,1,2-Trichloroethane	50.00	47.13	94	2	30	75-125
Trichloroethene	50.00	47.60	95	2	30	70-125
Trichlorotrifluoroethan	50.00	47.52	95	7	30	60-130
Trichlorofluoromethane	50.00	53.46	107	7	30	60-145
Vinyl chloride	50.00	53.22	106	10	30	50-145
Xylene(total)	150.0	150.1	100	0	30	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 51 outside limits
Spike Recovery: 1 out of 102 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V4BLK0515

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	69.94	70	40-140
Benzene	50.00	0.0000	43.78	88	80-120
Bromochloromethane	50.00	0.0000	46.67	93	65-130
Bromodichloromethane	50.00	0.0000	48.04	96	75-120
Bromoform	50.00	0.0000	49.40	99	70-130
Bromomethane	50.00	0.0000	45.56	91	30-145
2-Butanone	100.0	0.0000	122.5	122	30-150
Carbon disulfide	50.00	0.0000	47.08	94	35-160
Carbon tetrachloride	50.00	0.0000	47.79	96	65-140
Chlorobenzene	50.00	0.0000	50.78	102	80-120
Chloroethane	50.00	0.0000	45.04	90	60-135
Chloroform	50.00	0.0000	43.86	88	65-135
Chloromethane	50.00	0.0000	56.67	113	40-125
Cyclohexane	50.00	0.0000	45.45	91	60-130
Dibromochloromethane	50.00	0.0000	52.30	105	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	47.78	96	50-130
1,2-Dibromoethane	50.00	0.0000	49.47	99	80-120
1,2-Dichlorobenzene	50.00	0.0000	49.36	99	70-120
1,3-Dichlorobenzene	50.00	0.0000	52.43	105	75-125
1,4-Dichlorobenzene	50.00	0.0000	49.31	99	75-125
Dichlorodifluoromethane	50.00	0.0000	65.37	131	30-155
1,1-Dichloroethane	50.00	0.0000	43.45	87	70-135
1,2-Dichloroethane	50.00	0.0000	48.14	96	70-130
1,1-Dichloroethene	50.00	0.0000	45.28	90	70-130
cis-1,2-Dichloroethene	50.00	0.0000	44.95	90	70-125
trans-1,2-Dichloroethen	50.00	0.0000	46.34	93	60-140
1,2-Dichloropropane	50.00	0.0000	45.77	92	75-125
cis-1,3-Dichloropropene	50.00	0.0000	45.37	91	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

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FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V4BLK0515

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	53.08	106	55-140
1,4-Dioxane	1000	0.0000	900.2	90	50-150
Ethylbenzene	50.00	0.0000	51.39	103	75-125
2-Hexanone	100.0	0.0000	81.21	81	55-130
Isopropylbenzene	50.00	0.0000	55.90	112	75-125
Methyl acetate	50.00	0.0000	51.19	102	55-150
Methyl cyclohexane	50.00	0.0000	44.55	89	60-125
Methylene chloride	50.00	0.6416	48.82	96	55-140
4-Methyl-2-pentanone	100.0	0.0000	88.94	89	60-135
Methyl-tert-butyl ether	50.00	0.0000	42.66	85	65-125
Styrene	50.00	0.0000	53.47	107	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	44.24	88	65-130
Tetrachloroethene	55.00	0.0000	56.68	103	45-150
Toluene	50.00	0.0000	50.95	102	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	46.76	94	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	46.47	93	65-135
1,1,1-Trichloroethane	50.00	0.0000	47.76	96	65-130
1,1,2-Trichloroethane	50.00	0.0000	49.31	99	75-125
Trichloroethene	50.00	0.0000	49.52	99	70-125
Trichlorotrifluoroethan	50.00	0.0000	47.54	95	60-130
Trichlorofluoromethane	50.00	0.0000	50.86	102	60-145
Vinyl chloride	50.00	0.0000	45.98	92	50-145
Xylene(total)	150.0	0.0000	153.0	102	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 51 outside limits

COMMENTS: _____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V5BLK0520E Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	98.54	98	20-160
Benzene	50.00	0.0000	57.03	114	75-125
Bromochloromethane	50.00	0.0000	56.68	113	70-125
Bromodichloromethane	50.00	0.0000	55.81	112	70-130
Bromoform	50.00	0.0000	52.10	104	55-135
Bromomethane	50.00	0.0000	57.38	115	30-160
2-Butanone	100.0	0.0000	186.6	187*	30-160
Carbon disulfide	50.00	0.0000	58.61	117	45-160
Carbon tetrachloride	50.00	0.0000	53.59	107	65-135
Chlorobenzene	50.00	0.0000	53.70	107	75-125
Chloroethane	50.00	0.0000	55.09	110	40-155
Chloroform	50.00	0.0000	52.97	106	70-125
Chloromethane	50.00	0.3965	54.74	109	50-130
Cyclohexane	50.00	0.0000	55.00	110	65-140
Dibromochloromethane	50.00	0.0000	54.76	110	65-130
1,2-Dibromo-3-chloropro	50.00	0.0000	54.27	108	40-135
1,2-Dibromoethane	50.00	0.0000	53.82	108	70-125
1,2-Dichlorobenzene	50.00	0.0000	53.74	107	75-120
1,3-Dichlorobenzene	50.00	0.0000	51.41	103	70-125
1,4-Dichlorobenzene	50.00	0.0000	52.25	104	70-125
Dichlorodifluoromethane	50.00	0.0000	55.37	111	35-135
1,1-Dichloroethane	50.00	0.0000	54.26	108	75-125
1,2-Dichloroethane	50.00	0.0000	53.18	106	70-125
1,1-Dichloroethene	50.00	0.0000	55.41	111	65-135
cis-1,2-Dichloroethene	50.00	0.0000	52.89	106	65-125
trans-1,2-Dichloroethen	50.00	0.0000	52.76	106	65-135
1,2-Dichloropropane	50.00	0.0000	54.92	110	70-120
cis-1,3-Dichloropropene	50.00	0.0000	52.20	104	70-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

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FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: V5BLK0520E Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	53.54	107	65-125
1,4-Dioxane	1000	0.0000	1150	115	50-150
Ethylbenzene	50.00	0.0000	59.33	119	75-125
2-Hexanone	100.0	0.0000	99.64	100	45-145
Isopropylbenzene	50.00	0.0000	58.63	117	75-130
Methyl acetate	50.00	0.0000	54.52	109	45-265
Methyl cyclohexane	50.00	0.0000	58.51	117	65-135
Methylene chloride	50.00	11.35	62.60	102	55-140
4-Methyl-2-pentanone	100.0	0.0000	114.9	115	45-145
Methyl-tert-butyl ether	50.00	0.0000	51.21	102	55-150
Styrene	50.00	0.0000	60.00	120	75-125
1,1,2,2-Tetrachloroetha	50.00	0.0000	52.05	104	55-130
Tetrachloroethene	55.00	0.0000	66.70	121	65-140
Toluene	50.00	0.0000	56.09	112	70-125
1,2,3-Trichlorobenzene	50.00	0.0000	55.12	110	60-135
1,2,4-Trichlorobenzene	50.00	0.0000	54.42	109	65-130
1,1,1-Trichloroethane	50.00	0.0000	53.11	106	70-135
1,1,2-Trichloroethane	50.00	0.0000	51.23	102	60-125
Trichloroethene	50.00	0.0000	57.70	115	75-125
Trichlorotrifluoroethan	50.00	0.0000	55.99	112	60-140
Trichlorofluoromethane	50.00	0.0000	53.39	107	25-185
Vinyl chloride	50.00	0.0000	48.08	96	60-125
Xylene(total)	150.0	0.0000	170.6	114	70-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 1 out of 51 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: V1BLK01 Lab Sample ID: V1BLK0514

Date Analyzed: 05/14/08 Time Analyzed: 1540

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

Instrument ID: VOA1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V1BLK0514LCS	V1BLK0514LCS	V1LCSAP9	1430
02	1041SB003 (0	0805104-05	0510405	1726
03	1041SB001 (0	0805104-06	0510406	1802
04	1034SB006 (0	0805104-07	0510407	1837
05	1034DUP01 (0	0805104-08	0510408	1912
06	1034SB007 (0	0805104-09	0510409	1948
07	SSB-026 (19-	0805104-10	0510410	2023
08	SSB-025 (19-	0805104-11	0510411	2058
09	SSB-021 (23-	0805104-12	0510412	2134
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0514

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/14/08 15:40

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.0	10		U
71-43-2	Benzene	0.47	5.0		U
74-97-5	Bromochloromethane	0.42	5.0		U
75-27-4	Bromodichloromethane	0.30	5.0		U
75-25-2	Bromoform	1.0	5.0		U
74-83-9	Bromomethane	0.72	5.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	1.3	5.0		U
56-23-5	Carbon tetrachloride	0.88	5.0		U
108-90-7	Chlorobenzene	0.34	5.0		U
75-00-3	Chloroethane	1.1	5.0		U
67-66-3	Chloroform	0.55	5.0		U
74-87-3	Chloromethane	0.52	5.0		U
110-82-7	Cyclohexane	0.54	5.0		U
124-48-1	Dibromochloromethane	0.34	5.0		U
96-12-8	1,2-Dibromo-3-chloropropane	1.2	5.0		U
106-93-4	1,2-Dibromoethane	0.43	5.0		U
95-50-1	1,2-Dichlorobenzene	0.37	5.0		U
541-73-1	1,3-Dichlorobenzene	0.84	5.0		U
106-46-7	1,4-Dichlorobenzene	0.55	5.0		U
75-71-8	Dichlorodifluoromethane	1.1	5.0		U
75-34-3	1,1-Dichloroethane	0.54	5.0		U
107-06-2	1,2-Dichloroethane	0.46	5.0		U
75-35-4	1,1-Dichloroethene	1.2	5.0		U
156-59-2	cis-1,2-Dichloroethene	1.2	5.0		U
156-60-5	trans-1,2-Dichloroethene	1.1	5.0		U
78-87-5	1,2-Dichloropropane	0.46	5.0		U
10061-01-5	cis-1,3-Dichloropropene	0.50	5.0		U
10061-02-6	trans-1,3-Dichloropropene	0.32	5.0		U
123-91-1	1,4-Dioxane	0.50	50		U
100-41-4	Ethylbenzene	0.75	5.0		U
591-78-6	2-Hexanone	2.3	10		U
98-82-8	Isopropylbenzene	0.88	5.0		U
79-20-9	Methyl acetate	1.6	5.0		U
108-87-2	Methyl cyclohexane	0.30	5.0		U
75-09-2	Methylene chloride	0.62	5.0	2.8	J
108-10-1	4-Methyl-2-pentanone	0.58	10		U
1634-04-4	Methyl-tert-butyl ether	0.32	5.0		U
100-42-5	Styrene	0.35	5.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0514

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/14/08 15:40

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.43	5.0		U
127-18-4	Tetrachloroethene	0.97	5.0		U
108-88-3	Toluene	0.86	5.0		U
87-61-6	1,2,3-Trichlorobenzene	0.42	5.0		U
120-82-1	1,2,4-Trichlorobenzene	0.18	5.0		U
71-55-6	1,1,1-Trichloroethane	0.90	5.0		U
79-00-5	1,1,2-Trichloroethane	0.35	5.0		U
79-01-6	Trichloroethene	0.85	5.0		U
76-13-1	Trichlorotrifluoroethane	0.55	5.0		U
75-69-4	Trichlorofluoromethane	0.95	5.0		U
75-01-4	Vinyl chloride	1.1	5.0		U
1330-20-7	Xylene(total)	0.70	5.0		U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V4BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: V4BLK01 Lab Sample ID: V4BLK0514

Date Analyzed: 05/14/08 Time Analyzed: 0919

Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA4

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V4BLK0514LCS	V4BLK0514LCS	V4LCS01	0752
02	TB-4 (050908	0805104-04	0510404	0948
03	1041HP004 (0	0805104-01	0510401	1146
04	1041HP001 (0	0805104-02	0510402	1215
05	1041HP003 (0	0805104-03	0510403	1245
06	V4BLK0514LCS	V4BLK0514LCSD	V4LCSD01	1809
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0514

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 05/14/08 09:19

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.67	J
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0514

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 05/14/08 09:19

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V4BLK0515

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: V4BLK01 Lab Sample ID: V4BLK0515

Date Analyzed: 05/15/08 Time Analyzed: 1833

Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA4

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V4BLK0515LCS	V4BLK0515LCS	V4LCSAP9	1707
02	TB-4 (051020	0805115-05	0511505	1903
03	EB001 (05102	0805115-06	0511506	2031
04	5GP-HP021 (0	0805115-01	0511501	2101
05	5GP-HP026 (0	0805115-02	0511502	2130
06	5GP-HP025 (0	0805115-03	0511503	2200
07	1549 HP008 (	0805115-04	0511504	2229
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0515

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0515

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 05/15/08 18:33

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.64	J
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V5BLK0520E

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: V5BLK0520E

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V5BLK01E

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/20/08 19:21

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.6	10		U
71-43-2	Benzene	0.19	5.0		U
74-97-5	Bromochloromethane	0.35	5.0		U
75-27-4	Bromodichloromethane	0.22	5.0		U
75-25-2	Bromoform	0.59	5.0		U
74-83-9	Bromomethane	0.41	5.0		U
78-93-3	2-Butanone	2.0	10		U
75-15-0	Carbon disulfide	0.27	5.0		U
56-23-5	Carbon tetrachloride	0.24	5.0		U
108-90-7	Chlorobenzene	0.33	5.0		U
75-00-3	Chloroethane	0.40	5.0		U
67-66-3	Chloroform	0.43	5.0		U
74-87-3	Chloromethane	0.36	5.0	0.40	J
110-82-7	Cyclohexane	0.42	5.0		U
124-48-1	Dibromochloromethane	0.24	5.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.68	5.0		U
106-93-4	1,2-Dibromoethane	0.56	5.0		U
95-50-1	1,2-Dichlorobenzene	0.23	5.0		U
541-73-1	1,3-Dichlorobenzene	0.23	5.0		U
106-46-7	1,4-Dichlorobenzene	0.18	5.0		U
75-71-8	Dichlorodifluoromethane	0.30	5.0		U
75-34-3	1,1-Dichloroethane	0.41	5.0		U
107-06-2	1,2-Dichloroethane	0.43	5.0		U
75-35-4	1,1-Dichloroethene	0.32	5.0		U
156-59-2	cis-1,2-Dichloroethene	0.27	5.0		U
156-60-5	trans-1,2-Dichloroethene	0.55	5.0		U
78-87-5	1,2-Dichloropropane	0.57	5.0		U
10061-01-5	cis-1,3-Dichloropropene	0.35	5.0		U
10061-02-6	trans-1,3-Dichloropropene	0.37	5.0		U
123-91-1	1,4-Dioxane	0.50	50		U
100-41-4	Ethylbenzene	0.24	5.0		U
591-78-6	2-Hexanone	0.61	10		U
98-82-8	Isopropylbenzene	0.26	5.0		U
79-20-9	Methyl acetate	0.57	5.0		U
108-87-2	Methyl cyclohexane	0.39	5.0		U
75-09-2	Methylene chloride	1.1	5.0	11	
108-10-1	4-Methyl-2-pentanone	0.60	10		U
1634-04-4	Methyl-tert-butyl ether	0.57	5.0		U
100-42-5	Styrene	0.34	5.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V5BLK0520E

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: V5BLK0520E

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V5BLK01E

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 05/20/08 19:21

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.32	5.0		U
127-18-4	Tetrachloroethene	0.21	5.0		U
108-88-3	Toluene	0.38	5.0		U
87-61-6	1,2,3-Trichlorobenzene	0.19	5.0		U
120-82-1	1,2,4-Trichlorobenzene	0.31	5.0		U
71-55-6	1,1,1-Trichloroethane	0.34	5.0		U
79-00-5	1,1,2-Trichloroethane	0.49	5.0		U
79-01-6	Trichloroethene	0.41	5.0		U
76-13-1	Trichlorotrifluoroethane	0.36	5.0		U
75-69-4	Trichlorofluoromethane	0.41	5.0		U
75-01-4	Vinyl chloride	0.47	5.0		U
1330-20-7	Xylene(total)	0.21	5.0		U

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA88279

Lab File ID: V1BFB01 BFB Injection Date: 02/15/08

Instrument ID: VOA1 BFB Injection Time: 0954

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.6
75	30.0 - 60.0% of mass 95	49.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	73.6
175	5.0 - 9.0% of mass 174	5.5 (7.5)1
176	95.0 - 101.0% of mass 174	71.0 (96.5)1
177	5.0 - 9.0% of mass 176	5.1 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1AP9CAL	V1AP9CAL	V1ASTD7	02/15/08	1530
02	V1AP9CAL	V1AP9CAL	V1ASTD6	02/15/08	1605
03	V1AP9CAL	V1AP9CAL	V1ASTD5	02/15/08	1640
04	V1BLK0215LCS	V1BLK0215LCS	V1ICVAP9	02/15/08	1715
05	V1AP9CAL	V1AP9CAL	V1ASTD4	02/15/08	1750
06	V1AP9CAL	V1AP9CAL	V1ASTD3	02/15/08	1825
07	V1AP9CAL	V1AP9CAL	V1ASTD2	02/15/08	1900
08	V1AP9CAL	V1AP9CAL	V1ASTD1	02/15/08	1935
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: CITY

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA25189

Lab File ID: V4BFB01 BFB Injection Date: 04/02/08

Instrument ID: VOA4 BFB Injection Time: 1352

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.3
75	30.0 - 60.0% of mass 95	41.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	82.0
175	5.0 - 9.0% of mass 174	6.1 (7.4)1
176	95.0 - 101.0% of mass 174	78.2 (95.4)1
177	5.0 - 9.0% of mass 176	5.3 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		V4CALIB	V4ASTD09	04/02/08	1649
02		V4CALIB	V4ASTD08	04/02/08	1718
03		V4CALIB	V4ASTD07	04/02/08	1748
04		V4CALIB	V4ASTD06	04/02/08	1847
05		V4CALIB	V4ASTD05	04/02/08	1916
06		V4CALIB	V4ASTD04	04/02/08	1946
07		V4CALIB	V4ASTD03	04/02/08	2015
08		V4CALIB	V4ASTD02	04/02/08	2044
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA25189

Lab File ID: V4BFB01 BFB Injection Date: 04/09/08

Instrument ID: VOA4 BFB Injection Time: 1359

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	23.9
75	30.0 - 60.0% of mass 95	44.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	58.1
175	5.0 - 9.0% of mass 174	4.1 (7.0)1
176	95.0 - 101.0% of mass 174	58.1 (100.0)1
177	5.0 - 9.0% of mass 176	3.7 (6.3)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD200PPB	V4STD200PPB	V4STD09	04/09/08	1458
02	V4STD100PPB	V4STD100PPB	V4STD08	04/09/08	1528
03	V4STD50PPB	V4STD50PPB	V4STD07	04/09/08	1557
04	V4BLK0409LCS	V4BLK0409LCS	V4ICV01	04/09/08	1627
05	V4STD20PPB	V4STD20PPB	V4STD06	04/09/08	1656
06	V4STD10PPB	V4STD10PPB	V4STD05	04/09/08	1726
07	V4STD2PPB	V4STD2PPB	V4STD04	04/09/08	1755
08	V4STD1PPB	V4STD1PPB	V4STD03	04/09/08	1824
09	V4STD0.5PPB	V4STD0.5PPB	V4STD02	04/09/08	1854
10	V4STD0.25PPB	V4STD0.25PPB	V4STD01	04/09/08	1924
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA87791

Lab File ID: V1BFB01 BFB Injection Date: 05/01/08

Instrument ID: VOA1 BFB Injection Time: 1016

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.0
75	30.0 - 60.0% of mass 95	46.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	76.3
175	5.0 - 9.0% of mass 174	5.8 (7.6)1
176	95.0 - 101.0% of mass 174	76.8 (100.8)1
177	5.0 - 9.0% of mass 176	5.2 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1STD200PPB	V1STD200PPB	V1STD07	05/01/08	1138
02		V1STD100PPB	V1STD06	05/01/08	1213
03		V1STD50PPB	V1STD05	05/01/08	1249
04		V1STD20PPB	V1STD04	05/01/08	1324
05		V1STD10PPB	V1STD03	05/01/08	1359
06		V1STD5PPB	V1STD02	05/01/08	1435
07		V1STD2PPB	V1STD01	05/01/08	1510
08	V1BLK0501LCS	V1BLK0501LCS	V1ICV01	05/01/08	1545
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: V4BFB01 BFB Injection Date: 05/14/08

Instrument ID: VOA4 BFB Injection Time: 0624

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.2
75	30.0 - 60.0% of mass 95	38.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	67.8
175	5.0 - 9.0% of mass 174	4.6 (6.8)1
176	95.0 - 101.0% of mass 174	66.0 (97.5)1
177	5.0 - 9.0% of mass 176	4.7 (7.2)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD50PPB	V4STD50PPB	V4CCVA9	05/14/08	0653
02	V4STD50PPB	V4STD50PPB	V4CCV01	05/14/08	0723
03	V4BLK0514LCS	V4BLK0514LCS	V4LCS01	05/14/08	0752
04	V4BLK0514	V4BLK0514	V4BLK01	05/14/08	0919
05	TB-4 (050908	0805104-04	0510404	05/14/08	0948
06	1041HP004 (0	0805104-01	0510401	05/14/08	1146
07	1041HP001 (0	0805104-02	0510402	05/14/08	1215
08	1041HP003 (0	0805104-03	0510403	05/14/08	1245
09	V4BLK0514LCS	V4BLK0514LCSD	V4LCSD01	05/14/08	1809
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: V1BFB01 BFB Injection Date: 05/14/08

Instrument ID: VOA1 BFB Injection Time: 1242

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.7
75	30.0 - 60.0% of mass 95	49.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.2
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	81.6
175	5.0 - 9.0% of mass 174	6.0 (7.4)1
176	95.0 - 101.0% of mass 174	78.3 (96.0)1
177	5.0 - 9.0% of mass 176	5.4 (6.9)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1STD50PPB	V1STD50PPB	V1CCV01	05/14/08	1300
02	V1STD50PPB	V1STD50PPB	V1CCVAP9	05/14/08	1354
03	V1BLK0514LCS	V1BLK0514LCS	V1LCSAP9	05/14/08	1430
04	V1BLK0514	V1BLK0514	V1BLK01	05/14/08	1540
05	1041SB003 (0	0805104-05	0510405	05/14/08	1726
06	1041SB001 (0	0805104-06	0510406	05/14/08	1802
07	1034SB006 (0	0805104-07	0510407	05/14/08	1837
08	1034DUP01 (0	0805104-08	0510408	05/14/08	1912
09	1034SB007 (0	0805104-09	0510409	05/14/08	1948
10	SSB-026 (19-	0805104-10	0510410	05/14/08	2023
11	SSB-025 (19-	0805104-11	0510411	05/14/08	2058
12	SSB-021 (23-	0805104-12	0510412	05/14/08	2134
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: V4BFB01 BFB Injection Date: 05/15/08

Instrument ID: VOA4 BFB Injection Time: 1538

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.8
75	30.0 - 60.0% of mass 95	42.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.0
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	59.0
175	5.0 - 9.0% of mass 174	4.1 (7.0)1
176	95.0 - 101.0% of mass 174	57.0 (96.7)1
177	5.0 - 9.0% of mass 176	4.5 (7.9)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD50PPB	V4STD50PPB	V4CCVA9	05/15/08	1608
02	V4STD50PPB	V4STD50PPB	V4CCV01	05/15/08	1637
03	V4BLK0515LCS	V4BLK0515LCS	V4LCSAP9	05/15/08	1707
04	V4BLK0515	V4BLK0515	V4BLK01	05/15/08	1833
05	TB-4 (051020	0805115-05	0511505	05/15/08	1903
06	EB001 (05102	0805115-06	0511506	05/15/08	2031
07	5GP-HP021 (0	0805115-01	0511501	05/15/08	2101
08	5GP-HP026 (0	0805115-02	0511502	05/15/08	2130
09	5GP-HP025 (0	0805115-03	0511503	05/15/08	2200
10	1549 HP008 (	0805115-04	0511504	05/15/08	2229
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA94575

Lab File ID: V5BFB01 BFB Injection Date: 05/19/08

Instrument ID: VOA5 BFB Injection Time: 1030

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.1
75	30.0 - 60.0% of mass 95	44.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	75.9
175	5.0 - 9.0% of mass 174	5.7 (7.5)1
176	95.0 - 101.0% of mass 174	74.0 (97.5)1
177	5.0 - 9.0% of mass 176	4.9 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V5STD200PPB	V5STD200PPB	V5CALS07	05/19/08	1132
02	V5STD100PPB	V5STD100PPB	V5CALS06	05/19/08	1204
03	V5STD50PPB	V5STD50PPB	V5CALS05	05/19/08	1235
04	V5STD20PPB	V5STD20PPB	V5CALS04	05/19/08	1306
05	V5STD10PPB	V5STD10PPB	V5CALS03	05/19/08	1337
06	V5STD5PPB	V5STD5PPB	V5CALS02	05/19/08	1408
07	V5STD2PPB	V5STD2PPB	V5CALS01	05/19/08	1439
08	V5BLK0519LCS	V5BLK0519LCS	V5SLCS01	05/19/08	1509
09	V5AP9CAL	V5AP9CAL	V5AP9CA7	05/19/08	1541
10	V5AP9CAL	V5AP9CAL	V5AP9CA6	05/19/08	1612
11	V5AP9CAL	V5AP9CAL	V5AP9CA5	05/19/08	1643
12	V5AP9CAL	V5AP9CAL	V5AP9CA4	05/19/08	1714
13	V5AP9CAL	V5AP9CAL	V5AP9CA3	05/19/08	1745
14	V5AP9CAL	V5AP9CAL	V5AP9CA2	05/19/08	1816
15	V5AP9CAL	V5AP9CAL	V5AP9CA1	05/19/08	1846
16	V5BLK0519LCS	V5BLK0519LCS	V5SAP9LC	05/19/08	1917
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: V5BFB01E BFB Injection Date: 05/20/08

Instrument ID: VOA5 BFB Injection Time: 1646

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.8
75	30.0 - 60.0% of mass 95	44.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.0
173	Less than 2.0% of mass 174	0.5 (0.8)1
174	Greater than 50.0% of mass 95	65.3
175	5.0 - 9.0% of mass 174	5.4 (8.3)1
176	95.0 - 101.0% of mass 174	64.0 (98.0)1
177	5.0 - 9.0% of mass 176	4.1 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V5STD50PPB	V5STD50PPB	V5CCV01E	05/20/08	1717
02	V5STD50PPB	V5STD50PPB	V5CCVA9E	05/20/08	1748
03	V5BLK0520ELC	V5BLK0520ELCS	V5LCSIXE	05/20/08	1819
04	V5BLK0520E	V5BLK0520E	V5BLK01E	05/20/08	1921
05	1041SB003 (7	0805105-01	0510501A	05/20/08	2156
06	1041SB001 (7	0805105-02	0510502A	05/20/08	2227
07	1034SB006 (7	0805105-03	0510503A	05/20/08	2258
08	1034SB007 (7	0805105-04	0510504A	05/20/08	2329
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FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): V4CCV01 Date Analyzed: 05/14/08

Instrument ID: VOA4 Time Analyzed: 0723

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1(FLB) AREA	#	RT	#	IS2(CBZ) AREA	#	RT	#	IS3(DCB) AREA	#	RT	#
	12 HOUR STD	1006773		13.36		392349		16.68		384420		18.64	
	UPPER LIMIT	2013546		13.86		784698		17.18		768840		19.14	
	LOWER LIMIT	503387		12.86		196175		16.18		192210		18.14	
	CLIENT SAMPLE NO.												
01	V4BLK0514LCS	970317		13.35		390216		16.68		361506		18.65	
02	V4BLK0514	885466		13.35		340552		16.68		291663		18.65	
03	TB-4 (050908	862431		13.36		312571		16.68		279345		18.64	
04	1041HP004 (0	769086		13.36		297807		16.68		241464		18.64	
05	1041HP001 (0	765465		13.35		288808		16.68		239441		18.65	
06	1041HP003 (0	751784		13.35		278240		16.68		228555		18.65	
07	V4BLK0514LCS	647485		13.35		283049		16.68		247414		18.65	
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): V1CCV01 Date Analyzed: 05/14/08

Instrument ID: VOA1 Time Analyzed: 1300

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	1532782	15.25	614047	20.29	485545	24.13
	UPPER LIMIT	3065564	15.75	1228094	20.79	971090	24.63
	LOWER LIMIT	766391	14.75	307024	19.79	242773	23.63
	CLIENT SAMPLE NO.						
01	V1BLK0514LCS	1303273	15.24	552672	20.29	422144	24.12
02	V1BLK0514	1270196	15.25	528556	20.29	394059	24.12
03	1041SB003 (0	1209710	15.25	509571	20.28	383182	24.13
04	1041SB001 (0	1173269	15.25	502559	20.28	367015	24.13
05	1034SB006 (0	1200096	15.25	499166	20.28	376309	24.11
06	1034DUP01 (0	1200573	15.25	508774	20.28	378811	24.11
07	1034SB007 (0	1160824	15.25	501114	20.28	369252	24.11
08	SSB-026 (19-	1165500	15.25	485654	20.28	379593	24.13
09	SSB-025 (19-	1139133	15.25	490892	20.28	377338	24.11
10	SSB-021 (23-	1148090	15.25	499016	20.28	373944	24.13
11							
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22							

IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): V4CCV01 Date Analyzed: 05/15/08

Instrument ID: VOA4 Time Analyzed: 1637

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	793289	13.37	323050	16.68	290933	18.65
	UPPER LIMIT	1586578	13.87	646100	17.18	581866	19.15
	LOWER LIMIT	396645	12.87	161525	16.18	145467	18.15
	CLIENT SAMPLE NO.						
01	V4BLK0515LCS	860944	13.36	346441	16.69	313586	18.65
02	V4BLK0515	733647	13.37	283903	16.69	242016	18.66
03	TB-4 (051020	717207	13.37	272982	16.69	225216	18.65
04	EB001 (05102	640733	13.37	254097	16.68	189432	18.65
05	5GP-HP021 (0	616109	13.36	246201	16.69	189017	18.66
06	5GP-HP026 (0	591257	13.37	237741	16.69	177583	18.66
07	5GP-HP025 (0	576772	13.36	236914	16.69	182657	18.65
08	1549 HP008 (	584163	13.36	239220	16.69	174863	18.65
09							
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20							
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22							

IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): V5CCV01E Date Analyzed: 05/20/08

Instrument ID: VOA5 Time Analyzed: 1717

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	768095	11.71	372555	15.52	385181	17.47
	UPPER LIMIT	1536190	12.21	745110	16.02	770362	17.97
	LOWER LIMIT	384048	11.21	186278	15.02	192591	16.97
	CLIENT SAMPLE NO.						
01	V5BLK0520ELC	817261	11.71	377151	15.51	394153	17.46
02	V5BLK0520E	754258	11.70	335268	15.51	351291	17.45
03	1041SB003 (7	752755	11.71	310058	15.51	348803	17.46
04	1041SB001 (7	733533	11.70	317426	15.51	346823	17.46
05	1034SB006 (7	732928	11.70	311422	15.51	337986	17.46
06	1034SB007 (7	727686	11.70	285566	15.51	345532	17.45
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22							

IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

SEMI-VOLATILES SECTION

ORGANIC CASE NARRATIVE - Semivolatiles
Arcadis – Radford002

Date Sampled	Date Received	Lab ID	Client ID	TAT/SDG
05/09/08	05/10/08	0805104-01	1041HP004 (050908)	X
05/09/08	05/10/08	0805104-02	1041HP001 (050908)	X
05/09/08	05/10/08	0805104-03	1041HP003 (050908)	X
05/09/08	05/10/08	0805104-05	1041SB003 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-06	1041SB001 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-07	1034SB006 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-08	1034DUP01 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-09	1034SB007 (0.5-1.5)	4BD
05/09/08	05/10/08	0805105-01	1041SB003 (7-8)	Radford003
05/09/08	05/10/08	0805105-02	1041SB001 (7-8)	Radford003
05/09/08	05/10/08	0805105-03	1034SB006 (7-8)	Radford003
05/09/08	05/10/08	0805105-04	1034SB007 (7-8)	Radford003
05/10/08	05/13/08	0805115-04	1549 HP008 (05102008)	X* cancelled
05/10/08	05/13/08	0805115-06	EB001 (05102008)	X

Method: The samples were extracted/analyzed by USEPA SW-846 Methods 3541/8270C or 3510C/8270C (automated soxhlet or separatory funnel extraction followed by capillary column GC/MS) for soils or waters upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note1: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction was requested 5/19/08 for samples reflected as SDG Radford003 but analysis is still pending request from the client. E-mail instructions are attached.
- Note2: Limited sample volume was received for sample 1549 HP008 (05102008). After centrifuging to determine actual amount of sample received, client instructed that the BNA fraction be cancelled. E-mail instructions are attached.
- DFTPP Tuning: All method tuning criteria were met. Radford criteria were exceeded as indicated in the following clarifications:

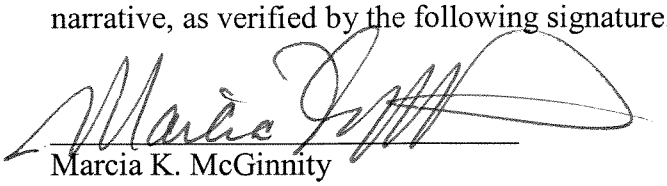
1. BNA3 ICV analyzed with the initial calibration exceeded 20% difference for benzo(g,h,i)perylene, 4-chloro-3-methylphenol, 2,4-dimethylphenol, hexachlorocyclopentadiene, 4-nitroaniline and pyrene with positive biases at 22.6%, 23.5%, 24.9%, 25.6%, 23.9% and 23.3%, respectively. These analytes were not detected in the associated samples.
2. BNA3 CCV analyzed 5/12/08 at 10:06 exceeded 20% difference for atrazine, benzaldehyde, carbazole, 3,3'-dichlorobenzidine, hexachlorocyclopentadiene and indeno(1,2,3-cd)perylene with negative biases of 32.1%, 48.1%, 27.7%, 44.2%, 34.9% and 24.6%, respectively. Results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias.
3. BNA3 CCV analyzed 5/13/08 at 11:15 exceeded 20% difference for atrazine, benzaldehyde, 3,3'-dichlorobenzidine and hexachlorocyclopentadiene with negative biases of 34.1%, 46%, 38.3% and 38.4%, respectively. Results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias.
4. BNA3 CCV analyzed 5/15/08 at 10:58 exceeded 20% difference for atrazine, benzaldehyde, carbazole, 4-chloroaniline, 3,3'-dichlorobenzidine, hexachlorocyclopentadiene, 3-nitroaniline and 4-nitrophenol with negative biases of 27.6%, 43.1%, 28.8%, 25.3%, 66.4%, 46.3%, 54.7% and 31.2%, respectively. Results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias.

- Blank Results: Method blanks SBLK0512BW1 and SBLK0515BW1 reported concentrations of caprolactam less than ½ the quantitation limit. Method blank SBLK0515BS1 reported concentrations of several PAH/phthalate analytes less than half the quantitation limit, dibenz(a,h)antracene at 180µg/kg and indeno(1,2,3-cd)pyrene at 160µg/kg. Only caprolactam and di-n-butylphthalate had reported concentrations in the associated samples and are qualified with a "B".
- Surrogate Recoveries: All surrogate recoveries were within limits with the exception of 2-fluorobiphenyl

in sample 1041SB003(0.5-1.5) which was below the limit of 45% at 44%.

- SBLK0512BW1LCS results: Recovery of caprolactam was below the limit of 20% at 17% while the recovery of 2,4-dinitrophenol exceeded the limit of 140% at 168%. All other recoveries were within limits.
- SBLK0515BW1LCS results: Recoveries of atrazine and caprolactam were below the limits of 70% and 20% at 68% and 12%, respectively. All other recoveries were within limits.
- SBLK0515BS1LCS/LCSD results: Recoveries of atrazine and 1,2,4,5-tetrachlorobenzene were below the limits of 55% and 50% at (57%)/50% and (55%)/48%, respectively. Relative percent differences for benzaldehyde, benzo(g,h,i)perylene, 4-nitrophenol and pentachlorophenol exceeded the limit of 30 at 46, 31, 42 and 48, respectively. All other recoveries and relative percent differences were within limits.
- MS/MSD Results: Not applicable.
- Internal Standard Area Counts: Area counts for the internal standard d12-perylene exceeded 200% of that found in the associated calibration verification at 319%, 201%, 294%, 203% and 223% in the analyses of SBLK0515BS1LCS, SBLK0515BS1LCSD, SBLK0515BS1, 1034SB006(0.5-1.5) and 1034DUP001(0.5-1.5). Area counts for the internal standard d12-chrysene exceeded 200% of that found in the associated calibration verification at 243% and 205% in the analyses of SBLK0515BS1LCS and SBLK0515BS1. All other area counts were within limits. Based on adequate LCS/LCSD recoveries, the internal standard exceedences were judged to have minimal impact on the reported results.
- Dilutions: All samples were analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.



Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, May 14, 2008 1:41 PM
To: MMcGinnity@EmpirLabs.com
Cc: Powell, Jace'que; Borne, Rachelle
Subject: RE: 1150ml of sample.....1549HP008(05102008)

i Marcia

rop the SVOC analysis request for these samples and perform the Explosives and the PCBs. This should give you the ll 1 liter for the explosives

ıanks
ne

ıne Kennedy
'inciple Scientist
RCADIS US, Inc.
350 N. Causeway Blvd.
ıite 1600
etairie, LA 70002
ıone: (504) 832-4174 Ext 106
ell: (225) 205-8256
mail: jane.kennedy@arcadis-us.com

om: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
ent: Wednesday, May 14, 2008 1:08 PM
o: Kennedy, Jane
ubject: RE: 1150ml of sample.....

otcha - they are holding extraction batches for these....if there's anything you can do to get them to ecide! ;)

ıanks,
arcia

From: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
Sent: Wednesday, May 14, 2008 12:34 PM
To: Kennedy, Jane
Subject: RE: 1150ml of sample.....

1549HP008(05102008)

Thanks,
Marcia

-----Original Message-----
From: Kennedy, Jane [mailto:Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, May 14, 2008 12:13 PM
To: MMcGinnity@EmpirLabs.com

Subject: RE: 1150ml of sample.....

Can you send me the sample ID again? I don't think the first part of the ID is correct

Jane Kennedy

Principle Scientist
ARCADIS US, Inc.
3850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002

Phone: (504) 832-4174 Ext 106
Cell: (225) 205-8256
e-mail: jane.kennedy@arcadis-us.com

From: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
Sent: Wednesday, May 14, 2008 11:24 AM
To: Kennedy, Jane
Subject: 1150ml of sample.....
Importance: High

Jane - we can probably do 100ml-1ml for PCB but it would take 500ml to maintain the SVOC RL - can we double the SVOC RLs and use 250ml to 0.5ml? That would leave 800ml for explosives.....

Thanks,
Marcia McGinnity, TME
Senior Project Manager
Empirical Laboratories, LLC
227 French Landing Drive, Suite 550 I Nashville, TN 37228 I www.empirlabs.com
Main: 615.345.1115 ext. 232 I Toll free: 877.345.1113 I Cell: 615.207.9918 I Fax: 615.846.5426

Recipient of the 2008 Region IV (Southeastern US) Subcontractor of the Year from the Small Business Administration.
Celebrating over 40 years of excellence, Empirical Laboratories is certified as a HUBZone Business, a Woman-Owned Small Business, and a Small Disadvantaged Business by the Small Business Administration. Come visit our website at www.empirlabs.com today.

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Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

ıalyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

‹tract and hold all of the other "HOLD" samples.

ım waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
ne

ne Kennedy
inciple Scientist
RCADIS US, Inc.
50 N. Causeway Blvd.
ıite 1600
etairie, LA 70002
ıone: (504) 832-4174 Ext 106
ell: (225) 205-8256
mail: jane.kennedy@arcadis-us.com

---

om: Sharpe, Christopher
ent: Friday, May 16, 2008 2:50 PM
o: Kennedy, Jane
: Llewellyn, Tim; Quinnan, Joseph; Wisbeck, Diane; Powell, Jace'que
ıbject: RE: using 12 samples

ust got off of the phone with Joe Q re these samples.
ets analyze the soil samples from 5DitchSB003 and 5DitchSB004 for VOCs only and discard the soil samples from DitchSB001 and 5ditchSB002

m and Diane agree that the potential cost savings for extract and hold on the 12 samples referenced below makes ense so let's do that as well.

TS

---

om: Kennedy, Jane
ent: Friday, May 16, 2008 1:54 PM
o: Sharpe, Christopher
ıbject: using 12 samples

804.80 to extract and hold the 12 for SVOCs, PCBs, Explosives

OCs are $1782 if we analyze the 12 remaining

ne Kennedy
inciple Scientist
RCADIS US, Inc.
50 N. Causeway Blvd.
ıite 1600
etairie, LA 70002

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP004
(050908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 0510401

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 09:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 17:56

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.63	5.0		U
208-96-8	Acenaphthylene	0.47	5.0		U
98-86-2	Acetophenone	0.75	5.0		U
1912-24-9	Atrazine	0.69	5.0		UY
120-12-7	Anthracene	0.77	5.0		U
100-52-7	Benzaldehyde	0.57	5.0		UY
56-55-3	Benzo(a)anthracene	0.91	5.0		U
205-99-2	Benzo(b)fluoranthene	0.71	5.0		U
207-08-9	Benzo(k)fluoranthene	0.50	5.0		U
191-24-2	Benzo(g,h,i)perylene	1.5	5.0		U
50-32-8	Benzo(a)pyrene	0.60	2.0		U
92-52-4	1,1'-Biphenyl	0.39	5.0		U
111-91-1	bis(2-Chloroethoxy)methane	0.52	5.0		U
111-44-4	bis(2-Chloroethyl)ether	0.45	5.0		U
108-60-1	bis(2-Chloroisopropyl)ether	0.85	5.0		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.3	5.0		U
101-55-3	4-Bromophenyl-phenylether	0.57	5.0		U
85-68-7	Butylbenzylphthalate	0.82	5.0		U
105-60-2	Caprolactam	0.36	5.0	1.5	JB
86-74-8	Carbazole	0.69	5.0		U
106-47-8	4-Chloroaniline	0.95	5.0		U
59-50-7	4-Chloro-3-methylphenol	0.58	5.0		U
91-58-7	2-Chloronaphthalene	0.58	5.0		U
95-57-8	2-Chlorophenol	0.59	5.0		U
7005-72-3	4-Chlorophenyl-phenylether	0.89	5.0		U
218-01-9	Chrysene	1.0	5.0		U
53-70-3	Dibenz(a,h)anthracene	1.7	5.0		U
132-64-9	Dibenzofuran	0.65	5.0		U
91-94-1	3,3'-Dichlorobenzidine	0.89	5.0		UY
120-83-2	2,4-Dichlorophenol	0.44	5.0		U
84-66-2	Diethylphthalate	1.0	5.0		U
105-67-9	2,4-Dimethylphenol	0.71	20		U
131-11-3	Dimethylphthalate	0.74	5.0		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP004
(050908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-01

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 0510401

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 09:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 17:56

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.3	5.0		U
534-52-1	4,6-Dinitro-2-methylphenol	0.74	20		U
51-28-5	2,4-Dinitrophenol	0.85	50		U
121-14-2	2,4-Dinitrotoluene	0.49	5.0		U
606-20-2	2,6-Dinitrotoluene	0.66	5.0		U
117-84-0	Di-n-octylphthalate	0.33	5.0		U
206-44-0	Fluoranthene	0.70	5.0		U
86-73-7	Fluorene	0.55	5.0		U
118-74-1	Hexachlorobenzene	0.47	5.0		U
87-68-3	Hexachlorobutadiene	0.93	5.0		U
77-47-4	Hexachlorocyclopentadiene	0.89	5.0		UY
67-72-1	Hexachloroethane	0.46	5.0		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.4	5.0		U
78-59-1	Isophorone	0.55	5.0		U
91-57-6	2-Methylnaphthalene	0.68	5.0		U
91-20-3	Naphthalene	0.45	5.0		U
95-48-7	2-Methylphenol	0.83	5.0		U
106-44-5	4-Methylphenol	0.77	5.0		U
88-74-4	2-Nitroaniline	1.2	20		U
99-09-2	3-Nitroaniline	1.0	20		U
100-01-6	4-Nitroaniline	2.0	20		U
98-95-3	Nitrobenzene	0.62	5.0		U
88-75-5	2-Nitrophenol	0.74	5.0		U
100-02-7	4-Nitrophenol	0.83	20		U
86-30-6	N-Nitrosodiphenylamine (1)	0.46	5.0		U
621-64-7	N-Nitroso-di-n-propylamine	0.90	5.0		U
87-86-5	Pentachlorophenol	1.0	20		U
108-95-2	Phenol	0.46	5.0		U
129-00-0	Pyrene	0.65	5.0		U
95-94-3	1,2,4,5-Tetrachlorobenzene	1.0	5.0		U
95-95-4	2,4,5-Trichlorophenol	0.50	5.0		U
88-06-2	2,4,6-Trichlorophenol	0.73	5.0		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP001
(05092008

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-02

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 0510402

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 08:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 05/13/08 18:23

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.63	5.0		U
208-96-8	Acenaphthylene	0.47	5.0		U
98-86-2	Acetophenone	0.75	5.0		U
1912-24-9	Atrazine	0.69	5.0		UY
120-12-7	Anthracene	0.77	5.0		U
100-52-7	Benzaldehyde	0.57	5.0		UY
56-55-3	Benzo(a)anthracene	0.91	5.0		U
205-99-2	Benzo(b)fluoranthene	0.71	5.0		U
207-08-9	Benzo(k)fluoranthene	0.50	5.0		U
191-24-2	Benzo(g,h,i)perylene	1.5	5.0		U
50-32-8	Benzo(a)pyrene	0.60	2.0		U
92-52-4	1,1'-Biphenyl	0.39	5.0		U
111-91-1	bis(2-Chloroethoxy)methane	0.52	5.0		U
111-44-4	bis(2-Chloroethyl)ether	0.45	5.0		U
108-60-1	bis(2-Chloroisopropyl)ether	0.85	5.0		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.3	5.0		U
101-55-3	4-Bromophenyl-phenylether	0.57	5.0		U
85-68-7	Butylbenzylphthalate	0.82	5.0		U
105-60-2	Caprolactam	0.36	5.0	2.8	JB
86-74-8	Carbazole	0.69	5.0		U
106-47-8	4-Chloroaniline	0.95	5.0		U
59-50-7	4-Chloro-3-methylphenol	0.58	5.0		U
91-58-7	2-Chloronaphthalene	0.58	5.0		U
95-57-8	2-Chlorophenol	0.59	5.0		U
7005-72-3	4-Chlorophenyl-phenylether	0.89	5.0		U
218-01-9	Chrysene	1.0	5.0		U
53-70-3	Dibenz(a,h)anthracene	1.7	5.0		U
132-64-9	Dibenzofuran	0.65	5.0		U
91-94-1	3,3'-Dichlorobenzidine	0.89	5.0		UY
120-83-2	2,4-Dichlorophenol	0.44	5.0		U
84-66-2	Diethylphthalate	1.0	5.0		U
105-67-9	2,4-Dimethylphenol	0.71	20		U
131-11-3	Dimethylphthalate	0.74	5.0		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP001
(05092008

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-02

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 0510402

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 08:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 05/13/08 18:23

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.3	5.0		U
534-52-1	4,6-Dinitro-2-methylphenol	0.74	20		U
51-28-5	2,4-Dinitrophenol	0.85	50		U
121-14-2	2,4-Dinitrotoluene	0.49	5.0		U
606-20-2	2,6-Dinitrotoluene	0.66	5.0		U
117-84-0	Di-n-octylphthalate	0.33	5.0		U
206-44-0	Fluoranthene	0.70	5.0		U
86-73-7	Fluorene	0.55	5.0		U
118-74-1	Hexachlorobenzene	0.47	5.0		U
87-68-3	Hexachlorobutadiene	0.93	5.0		U
77-47-4	Hexachlorocyclopentadiene	0.89	5.0		UY
67-72-1	Hexachloroethane	0.46	5.0		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.4	5.0		U
78-59-1	Isophorone	0.55	5.0		U
91-57-6	2-Methylnaphthalene	0.68	5.0		U
91-20-3	Naphthalene	0.45	5.0		U
95-48-7	2-Methylphenol	0.83	5.0		U
106-44-5	4-Methylphenol	0.77	5.0		U
88-74-4	2-Nitroaniline	1.2	20		U
99-09-2	3-Nitroaniline	1.0	20		U
100-01-6	4-Nitroaniline	2.0	20		U
98-95-3	Nitrobenzene	0.62	5.0		U
88-75-5	2-Nitrophenol	0.74	5.0		U
100-02-7	4-Nitrophenol	0.83	20		U
86-30-6	N-Nitrosodiphenylamine (1)	0.46	5.0		U
621-64-7	N-Nitroso-di-n-propylamine	0.90	5.0		U
87-86-5	Pentachlorophenol	1.0	20		U
108-95-2	Phenol	0.46	5.0		U
129-00-0	Pyrene	0.65	5.0		U
95-94-3	1,2,4,5-Tetrachlorobenzene	1.0	5.0		U
95-95-4	2,4,5-Trichlorophenol	0.50	5.0		U
88-06-2	2,4,6-Trichlorophenol	0.73	5.0		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP003
(05092008

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-03

Sample wt/vol: 1040 (g/mL) ML Lab File ID: 0510403

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 11:20

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 18:49

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.60	4.8		U
208-96-8	Acenaphthylene	0.45	4.8		U
98-86-2	Acetophenone	0.72	4.8		U
1912-24-9	Atrazine	0.66	4.8		UY
120-12-7	Anthracene	0.74	4.8		U
100-52-7	Benzaldehyde	0.55	4.8		UY
56-55-3	Benzo(a)anthracene	0.88	4.8		U
205-99-2	Benzo(b)fluoranthene	0.68	4.8		U
207-08-9	Benzo(k)fluoranthene	0.48	4.8		U
191-24-2	Benzo(g,h,i)perylene	1.4	4.8		U
50-32-8	Benzo(a)pyrene	0.58	1.9		U
92-52-4	1,1'-Biphenyl	0.38	4.8		U
111-91-1	bis(2-Chloroethoxy)methane	0.50	4.8		U
111-44-4	bis(2-Chloroethyl)ether	0.43	4.8		U
108-60-1	bis(2-Chloroisopropyl)ether	0.82	4.8		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.2	4.8		U
101-55-3	4-Bromophenyl-phenylether	0.55	4.8		U
85-68-7	Butylbenzylphthalate	0.79	4.8		U
105-60-2	Caprolactam	0.35	4.8	0.97	JB
86-74-8	Carbazole	0.66	4.8		U
106-47-8	4-Chloroaniline	0.91	4.8		U
59-50-7	4-Chloro-3-methylphenol	0.56	4.8		U
91-58-7	2-Chloronaphthalene	0.56	4.8		U
95-57-8	2-Chlorophenol	0.57	4.8		U
7005-72-3	4-Chlorophenyl-phenylether	0.86	4.8		U
218-01-9	Chrysene	0.97	4.8		U
53-70-3	Dibenz(a,h)anthracene	1.6	4.8		U
132-64-9	Dibenzofuran	0.62	4.8		U
91-94-1	3,3'-Dichlorobenzidine	0.86	4.8		UY
120-83-2	2,4-Dichlorophenol	0.42	4.8		U
84-66-2	Diethylphthalate	0.98	4.8		U
105-67-9	2,4-Dimethylphenol	0.68	19		U
131-11-3	Dimethylphthalate	0.71	4.8		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP003
(05092008

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-03

Sample wt/vol: 1040 (g/mL) ML Lab File ID: 0510403

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 11:20

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/13/08 18:49

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.2	4.8		U
534-52-1	4,6-Dinitro-2-methylphenol	0.71	19		U
51-28-5	2,4-Dinitrophenol	0.82	48		U
121-14-2	2,4-Dinitrotoluene	0.47	4.8		U
606-20-2	2,6-Dinitrotoluene	0.63	4.8		U
117-84-0	Di-n-octylphthalate	0.32	4.8		U
206-44-0	Fluoranthene	0.67	4.8		U
86-73-7	Fluorene	0.53	4.8		U
118-74-1	Hexachlorobenzene	0.45	4.8		U
87-68-3	Hexachlorobutadiene	0.89	4.8		U
77-47-4	Hexachlorocyclopentadiene	0.86	4.8		UY
67-72-1	Hexachloroethane	0.44	4.8		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.4	4.8		U
78-59-1	Isophorone	0.53	4.8		U
91-57-6	2-Methylnaphthalene	0.65	4.8		U
91-20-3	Naphthalene	0.43	4.8		U
95-48-7	2-Methylphenol	0.80	4.8		U
106-44-5	4-Methylphenol	0.74	4.8		U
88-74-4	2-Nitroaniline	1.1	19		U
99-09-2	3-Nitroaniline	1.0	19		U
100-01-6	4-Nitroaniline	2.0	19		U
98-95-3	Nitrobenzene	0.60	4.8		U
88-75-5	2-Nitrophenol	0.71	4.8		U
100-02-7	4-Nitrophenol	0.80	19		U
86-30-6	N-Nitrosodiphenylamine (1)	0.44	4.8		U
621-64-7	N-Nitroso-di-n-propylamine	0.86	4.8		U
87-86-5	Pentachlorophenol	0.96	19		U
108-95-2	Phenol	0.44	4.8		U
129-00-0	Pyrene	0.62	4.8		U
95-94-3	1,2,4,5-Tetrachlorobenzene	0.96	4.8		U
95-95-4	2,4,5-Trichlorophenol	0.48	4.8		U
88-06-2	2,4,6-Trichlorophenol	0.70	4.8		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-05

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0510405

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/09/08 10:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 12:56

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	33	410		U
208-96-8	Acenaphthylene	24	410		U
98-86-2	Acetophenone	51	410		U
1912-24-9	Atrazine	35	410		UY
120-12-7	Anthracene	34	410		U
100-52-7	Benzaldehyde	69	410		UY
56-55-3	Benzo(a)anthracene	45	160		U
205-99-2	Benzo(b)fluoranthene	39	160		U
207-08-9	Benzo(k)fluoranthene	49	410		U
191-24-2	Benzo(g,h,i)perylene	87	410		U
50-32-8	Benzo(a)pyrene	28	160		U
92-52-4	1,1'-Biphenyl	36	410		U
111-91-1	bis(2-Chloroethoxy)methane	38	410		U
111-44-4	bis(2-Chloroethyl)ether	50	410		U
108-60-1	bis(2-Chloroisopropyl)ether	63	410		U
117-81-7	Bis(2-ethylhexyl)phthalate	45	410		U
101-55-3	4-Bromophenyl-phenylether	32	410		U
85-68-7	Butylbenzylphthalate	37	410		U
105-60-2	Caprolactam	83	410		U
86-74-8	Carbazole	45	410		UY
106-47-8	4-Chloroaniline	59	410		UY
59-50-7	4-Chloro-3-methylphenol	34	410		U
91-58-7	2-Chloronaphthalene	40	410		U
95-57-8	2-Chlorophenol	50	410		U
7005-72-3	4-Chlorophenyl-phenylether	38	410		U
218-01-9	Chrysene	38	410		U
53-70-3	Dibenz(a,h)anthracene	74	160		U
132-64-9	Dibenzofuran	30	410		U
91-94-1	3,3'-Dichlorobenzidine	39	410		UY
120-83-2	2,4-Dichlorophenol	23	410		U
84-66-2	Diethylphthalate	42	410		U
105-67-9	2,4-Dimethylphenol	26	1600		U
131-11-3	Dimethylphthalate	38	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-05

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0510405

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/09/08 10:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 12:56

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	38	410		U
534-52-1	4,6-Dinitro-2-methylphenol	27	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	30	410		U
606-20-2	2,6-Dinitrotoluene	47	410		U
117-84-0	Di-n-octylphthalate	33	410		U
206-44-0	Fluoranthene	66	410		U
86-73-7	Fluorene	32	410		U
118-74-1	Hexachlorobenzene	43	410		U
87-68-3	Hexachlorobutadiene	40	410		U
77-47-4	Hexachlorocyclopentadiene	76	410		UY
67-72-1	Hexachloroethane	49	410		U
193-39-5	Indeno(1,2,3-cd)pyrene	57	160		U
78-59-1	Isophorone	35	410		U
91-57-6	2-Methylnaphthalene	43	410		U
91-20-3	Naphthalene	40	410		U
95-48-7	2-Methylphenol	48	410		U
106-44-5	4-Methylphenol	33	410		U
88-74-4	2-Nitroaniline	40	1600		U
99-09-2	3-Nitroaniline	58	1600		UY
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	43	410		U
88-75-5	2-Nitrophenol	27	410		U
100-02-7	4-Nitrophenol	100	1600		UY
86-30-6	N-Nitrosodiphenylamine (1)	40	410		U
621-64-7	N-Nitroso-di-n-propylamine	68	410		U
87-86-5	Pentachlorophenol	42	1600		U
108-95-2	Phenol	45	410		U
129-00-0	Pyrene	49	410		U
95-94-3	1,2,4,5-Tetrachlorobenzene	120	410		U
95-95-4	2,4,5-Trichlorophenol	33	410		U
88-06-2	2,4,6-Trichlorophenol	43	410		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-06

Sample wt/vol: 15.5 (g/mL) G Lab File ID: 0510406

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/09/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 13:23

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	32	410		U
208-96-8	Acenaphthylene	24	410		U
98-86-2	Acetophenone	50	410		U
1912-24-9	Atrazine	35	410		UY
120-12-7	Anthracene	33	410		U
100-52-7	Benzaldehyde	68	410		UY
56-55-3	Benzo(a)anthracene	44	160		U
205-99-2	Benzo(b)fluoranthene	38	160		U
207-08-9	Benzo(k)fluoranthene	48	410		U
191-24-2	Benzo(g,h,i)perylene	86	410		U
50-32-8	Benzo(a)pyrene	28	160		U
92-52-4	1,1'-Biphenyl	36	410		U
111-91-1	bis(2-Chloroethoxy)methane	38	410		U
111-44-4	bis(2-Chloroethyl)ether	50	410		U
108-60-1	bis(2-Chloroisopropyl)ether	63	410		U
117-81-7	Bis(2-ethylhexyl)phthalate	44	410		U
101-55-3	4-Bromophenyl-phenylether	32	410		U
85-68-7	Butylbenzylphthalate	36	410		U
105-60-2	Caprolactam	82	410	140	J
86-74-8	Carbazole	44	410		UY
106-47-8	4-Chloroaniline	58	410		UY
59-50-7	4-Chloro-3-methylphenol	34	410		U
91-58-7	2-Chloronaphthalene	39	410		U
95-57-8	2-Chlorophenol	50	410		U
7005-72-3	4-Chlorophenyl-phenylether	38	410		U
218-01-9	Chrysene	38	410		U
53-70-3	Dibenz(a,h)anthracene	74	160		U
132-64-9	Dibenzofuran	30	410		U
91-94-1	3,3'-Dichlorobenzidine	38	410		UY
120-83-2	2,4-Dichlorophenol	23	410		U
84-66-2	Diethylphthalate	41	410		U
105-67-9	2,4-Dimethylphenol	26	1600		U
131-11-3	Dimethylphthalate	37	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-06

Sample wt/vol: 15.5 (g/mL) G Lab File ID: 0510406

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/09/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 13:23

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	37	410		U
534-52-1	4,6-Dinitro-2-methylphenol	27	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	29	410		U
606-20-2	2,6-Dinitrotoluene	46	410		U
117-84-0	Di-n-octylphthalate	33	410		U
206-44-0	Fluoranthene	65	410		U
86-73-7	Fluorene	32	410		U
118-74-1	Hexachlorobenzene	42	410		U
87-68-3	Hexachlorobutadiene	40	410		U
77-47-4	Hexachlorocyclopentadiene	75	410		UY
67-72-1	Hexachloroethane	48	410		U
193-39-5	Indeno(1,2,3-cd)pyrene	56	160		U
78-59-1	Isophorone	35	410		U
91-57-6	2-Methylnaphthalene	43	410		U
91-20-3	Naphthalene	40	410		U
95-48-7	2-Methylphenol	47	410		U
106-44-5	4-Methylphenol	32	410		U
88-74-4	2-Nitroaniline	39	1600		U
99-09-2	3-Nitroaniline	58	1600		UY
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	42	410		U
88-75-5	2-Nitrophenol	27	410		U
100-02-7	4-Nitrophenol	99	1600		UY
86-30-6	N-Nitrosodiphenylamine (1)	39	410		U
621-64-7	N-Nitroso-di-n-propylamine	67	410		U
87-86-5	Pentachlorophenol	41	1600		U
108-95-2	Phenol	44	410		U
129-00-0	Pyrene	48	410		U
95-94-3	1,2,4,5-Tetrachlorobenzene	120	410		U
95-95-4	2,4,5-Trichlorophenol	33	410		U
88-06-2	2,4,6-Trichlorophenol	43	410		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-07

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 0510407

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 13:49

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	33	420		U
208-96-8	Acenaphthylene	25	420		U
98-86-2	Acetophenone	52	420		U
1912-24-9	Atrazine	36	420		UY
120-12-7	Anthracene	34	420		U
100-52-7	Benzaldehyde	70	420		UY
56-55-3	Benzo(a)anthracene	46	170		U
205-99-2	Benzo(b)fluoranthene	40	170		U
207-08-9	Benzo(k)fluoranthene	49	420		U
191-24-2	Benzo(g,h,i)perylene	89	420		U
50-32-8	Benzo(a)pyrene	29	170		U
92-52-4	1,1'-Biphenyl	37	420		U
111-91-1	bis(2-Chloroethoxy)methane	39	420		U
111-44-4	bis(2-Chloroethyl)ether	51	420		U
108-60-1	bis(2-Chloroisopropyl)ether	64	420		U
117-81-7	Bis(2-ethylhexyl)phthalate	45	420		U
101-55-3	4-Bromophenyl-phenylether	32	420		U
85-68-7	Butylbenzylphthalate	37	420		U
105-60-2	Caprolactam	85	420	200	J
86-74-8	Carbazole	46	420		UY
106-47-8	4-Chloroaniline	60	420		UY
59-50-7	4-Chloro-3-methylphenol	35	420		U
91-58-7	2-Chloronaphthalene	40	420		U
95-57-8	2-Chlorophenol	51	420		U
7005-72-3	4-Chlorophenyl-phenylether	39	420		U
218-01-9	Chrysene	39	420		U
53-70-3	Dibenz(a,h)anthracene	76	170		U
132-64-9	Dibenzofuran	31	420		U
91-94-1	3,3'-Dichlorobenzidine	40	420		UY
120-83-2	2,4-Dichlorophenol	24	420		U
84-66-2	Diethylphthalate	43	420		U
105-67-9	2,4-Dimethylphenol	27	1700		U
131-11-3	Dimethylphthalate	38	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB006
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-07

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 0510407

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 13:49

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	38	420	42	JB
534-52-1	4,6-Dinitro-2-methylphenol	27	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U
117-84-0	Di-n-octylphthalate	34	420		U
206-44-0	Fluoranthene	67	420		U
86-73-7	Fluorene	33	420		U
118-74-1	Hexachlorobenzene	44	420		U
87-68-3	Hexachlorobutadiene	41	420		U
77-47-4	Hexachlorocyclopentadiene	77	420		UY
67-72-1	Hexachloroethane	49	420		U
193-39-5	Indeno(1,2,3-cd)pyrene	58	170		U
78-59-1	Isophorone	36	420		U
91-57-6	2-Methylnaphthalene	44	420		U
91-20-3	Naphthalene	41	420		U
95-48-7	2-Methylphenol	49	420		U
106-44-5	4-Methylphenol	33	420		U
88-74-4	2-Nitroaniline	40	1700		U
99-09-2	3-Nitroaniline	59	1700		UY
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	44	420		U
88-75-5	2-Nitrophenol	28	420		U
100-02-7	4-Nitrophenol	100	1700		UY
86-30-6	N-Nitrosodiphenylamine (1)	40	420		U
621-64-7	N-Nitroso-di-n-propylamine	69	420		U
87-86-5	Pentachlorophenol	42	1700		U
108-95-2	Phenol	45	420		U
129-00-0	Pyrene	50	420		U
95-94-3	1,2,4,5-Tetrachlorobenzene	120	420		U
95-95-4	2,4,5-Trichlorophenol	34	420		U
88-06-2	2,4,6-Trichlorophenol	44	420		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034DUP01
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-08

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0510408

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 14:17

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
83-32-9	Acenaphthene	34	430		U
208-96-8	Acenaphthylene	25	430		U
98-86-2	Acetophenone	53	430		U
1912-24-9	Atrazine	37	430		UY
120-12-7	Anthracene	35	430		U
100-52-7	Benzaldehyde	72	430		UY
56-55-3	Benzo(a)anthracene	47	170		U
205-99-2	Benzo(b)fluoranthene	41	170		U
207-08-9	Benzo(k)fluoranthene	51	430		U
191-24-2	Benzo(g,h,i)perylene	91	430		U
50-32-8	Benzo(a)pyrene	30	170		U
92-52-4	1,1'-Biphenyl	38	430		U
111-91-1	bis(2-Chloroethoxy)methane	40	430		U
111-44-4	bis(2-Chloroethyl)ether	53	430		U
108-60-1	bis(2-Chloroisopropyl)ether	66	430		U
117-81-7	Bis(2-ethylhexyl)phthalate	47	430		U
101-55-3	4-Bromophenyl-phenylether	33	430		U
85-68-7	Butylbenzylphthalate	38	430		U
105-60-2	Caprolactam	87	430		U
86-74-8	Carbazole	47	430		UY
106-47-8	4-Chloroaniline	62	430		UY
59-50-7	4-Chloro-3-methylphenol	36	430		U
91-58-7	2-Chloronaphthalene	41	430		U
95-57-8	2-Chlorophenol	53	430		U
7005-72-3	4-Chlorophenyl-phenylether	40	430		U
218-01-9	Chrysene	40	430		U
53-70-3	Dibenz(a,h)anthracene	78	170		U
132-64-9	Dibenzofuran	32	430		U
91-94-1	3,3'-Dichlorobenzidine	41	430		UY
120-83-2	2,4-Dichlorophenol	24	430		U
84-66-2	Diethylphthalate	44	430		U
105-67-9	2,4-Dimethylphenol	28	1700		U
131-11-3	Dimethylphthalate	39	430		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034DUP01
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-08

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0510408

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 14:17

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	39	430	40	JB
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	31	430		U
606-20-2	2,6-Dinitrotoluene	49	430		U
117-84-0	Di-n-octylphthalate	35	430		U
206-44-0	Fluoranthene	69	430		U
86-73-7	Fluorene	34	430		U
118-74-1	Hexachlorobenzene	45	430		U
87-68-3	Hexachlorobutadiene	42	430		U
77-47-4	Hexachlorocyclopentadiene	79	430		UY
67-72-1	Hexachloroethane	51	430		U
193-39-5	Indeno(1,2,3-cd)pyrene	59	170		U
78-59-1	Isophorone	36	430		U
91-57-6	2-Methylnaphthalene	45	430		U
91-20-3	Naphthalene	42	430		U
95-48-7	2-Methylphenol	50	430		U
106-44-5	4-Methylphenol	34	430		U
88-74-4	2-Nitroaniline	41	1700		U
99-09-2	3-Nitroaniline	61	1700		UY
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	45	430		U
88-75-5	2-Nitrophenol	28	430		U
100-02-7	4-Nitrophenol	100	1700		UY
86-30-6	N-Nitrosodiphenylamine (1)	41	430		U
621-64-7	N-Nitroso-di-n-propylamine	71	430		U
87-86-5	Pentachlorophenol	44	1700		U
108-95-2	Phenol	46	430		U
129-00-0	Pyrene	51	430		U
95-94-3	1,2,4,5-Tetrachlorobenzene	130	430		U
95-95-4	2,4,5-Trichlorophenol	34	430		U
88-06-2	2,4,6-Trichlorophenol	45	430		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB007
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-09

Sample wt/vol: 15.7 (g/mL) G Lab File ID: 0510409

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/09/08 13:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 14:44

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	33	410		U
208-96-8	Acenaphthylene	24	410		U
98-86-2	Acetophenone	51	410		U
1912-24-9	Atrazine	35	410		UY
120-12-7	Anthracene	34	410		U
100-52-7	Benzaldehyde	69	410		UY
56-55-3	Benzo(a)anthracene	45	160		U
205-99-2	Benzo(b)fluoranthene	39	160	52	J
207-08-9	Benzo(k)fluoranthene	49	410		U
191-24-2	Benzo(g,h,i)perylene	88	410		U
50-32-8	Benzo(a)pyrene	28	160		U
92-52-4	1,1'-Biphenyl	37	410		U
111-91-1	bis(2-Chloroethoxy)methane	38	410		U
111-44-4	bis(2-Chloroethyl)ether	51	410		U
108-60-1	bis(2-Chloroisopropyl)ether	64	410		U
117-81-7	Bis(2-ethylhexyl)phthalate	45	410		U
101-55-3	4-Bromophenyl-phenylether	32	410		U
85-68-7	Butylbenzylphthalate	37	410		U
105-60-2	Caprolactam	84	410		U
86-74-8	Carbazole	45	410		UY
106-47-8	4-Chloroaniline	59	410		UY
59-50-7	4-Chloro-3-methylphenol	34	410		U
91-58-7	2-Chloronaphthalene	40	410		U
95-57-8	2-Chlorophenol	51	410		U
7005-72-3	4-Chlorophenyl-phenylether	38	410		U
218-01-9	Chrysene	38	410		U
53-70-3	Dibenz(a,h)anthracene	75	160		U
132-64-9	Dibenzofuran	30	410		U
91-94-1	3,3'-Dichlorobenzidine	39	410		UY
120-83-2	2,4-Dichlorophenol	23	410		U
84-66-2	Diethylphthalate	42	410		U
105-67-9	2,4-Dimethylphenol	26	1600		U
131-11-3	Dimethylphthalate	38	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1034SB007
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-09

Sample wt/vol: 15.7 (g/mL) G Lab File ID: 0510409

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/09/08 13:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 14:44

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	38	410	47	JB
534-52-1	4,6-Dinitro-2-methylphenol	27	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	30	410		U
606-20-2	2,6-Dinitrotoluene	47	410		U
117-84-0	Di-n-octylphthalate	33	410		U
206-44-0	Fluoranthene	66	410		U
86-73-7	Fluorene	32	410		U
118-74-1	Hexachlorobenzene	43	410		U
87-68-3	Hexachlorobutadiene	41	410		U
77-47-4	Hexachlorocyclopentadiene	76	410		UY
67-72-1	Hexachloroethane	49	410		U
193-39-5	Indeno(1,2,3-cd)pyrene	57	160		U
78-59-1	Isophorone	35	410		U
91-57-6	2-Methylnaphthalene	43	410		U
91-20-3	Naphthalene	40	410		U
95-48-7	2-Methylphenol	48	410		U
106-44-5	4-Methylphenol	33	410		U
88-74-4	2-Nitroaniline	40	1600		U
99-09-2	3-Nitroaniline	59	1600		UY
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	43	410		U
88-75-5	2-Nitrophenol	27	410		U
100-02-7	4-Nitrophenol	100	1600		UY
86-30-6	N-Nitrosodiphenylamine (1)	40	410		U
621-64-7	N-Nitroso-di-n-propylamine	68	410		U
87-86-5	Pentachlorophenol	42	1600		U
108-95-2	Phenol	45	410		U
129-00-0	Pyrene	49	410		U
95-94-3	1,2,4,5-Tetrachlorobenzene	120	410		U
95-95-4	2,4,5-Trichlorophenol	33	410		U
88-06-2	2,4,6-Trichlorophenol	43	410		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
EB001 (0 5102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-06

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: 0511506

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/10/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 16:05

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.70	5.6		U
208-96-8	Acenaphthylene	0.52	5.6		U
98-86-2	Acetophenone	0.83	5.6		U
1912-24-9	Atrazine	0.77	5.6		UY
120-12-7	Anthracene	0.86	5.6		U
100-52-7	Benzaldehyde	0.63	5.6	0.75	JY
56-55-3	Benzo(a)anthracene	1.0	5.6		U
205-99-2	Benzo(b)fluoranthene	0.79	5.6		U
207-08-9	Benzo(k)fluoranthene	0.56	5.6		U
191-24-2	Benzo(g,h,i)perylene	1.6	5.6		U
50-32-8	Benzo(a)pyrene	0.67	2.2		U
92-52-4	1,1'-Biphenyl	0.43	5.6		U
111-91-1	bis(2-Chloroethoxy)methane	0.58	5.6		U
111-44-4	bis(2-Chloroethyl)ether	0.50	5.6		U
108-60-1	bis(2-Chloroisopropyl)ether	0.94	5.6		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.4	5.6		U
101-55-3	4-Bromophenyl-phenylether	0.63	5.6		U
85-68-7	Butylbenzylphthalate	0.91	5.6		U
105-60-2	Caprolactam	0.40	5.6		U
86-74-8	Carbazole	0.77	5.6		UY
106-47-8	4-Chloroaniline	1.0	5.6		UY
59-50-7	4-Chloro-3-methylphenol	0.64	5.6		U
91-58-7	2-Chloronaphthalene	0.64	5.6		U
95-57-8	2-Chlorophenol	0.66	5.6		U
7005-72-3	4-Chlorophenyl-phenylether	0.99	5.6		U
218-01-9	Chrysene	1.1	5.6		U
53-70-3	Dibenz(a,h)anthracene	1.9	5.6		U
132-64-9	Dibenzofuran	0.72	5.6		U
91-94-1	3,3'-Dichlorobenzidine	0.99	5.6		UY
120-83-2	2,4-Dichlorophenol	0.49	5.6		U
84-66-2	Diethylphthalate	1.1	5.6		U
105-67-9	2,4-Dimethylphenol	0.79	22		U
131-11-3	Dimethylphthalate	0.82	5.6		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
EB001 (0 5102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-06

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: 0511506

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/10/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 16:05

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.4	5.6		U
534-52-1	4,6-Dinitro-2-methylphenol	0.82	22		U
51-28-5	2,4-Dinitrophenol	0.94	56		U
121-14-2	2,4-Dinitrotoluene	0.54	5.6		U
606-20-2	2,6-Dinitrotoluene	0.73	5.6		U
117-84-0	Di-n-octylphthalate	0.37	5.6		U
206-44-0	Fluoranthene	0.78	5.6		U
86-73-7	Fluorene	0.61	5.6		U
118-74-1	Hexachlorobenzene	0.52	5.6		U
87-68-3	Hexachlorobutadiene	1.0	5.6		U
77-47-4	Hexachlorocyclopentadiene	0.99	5.6		UY
67-72-1	Hexachloroethane	0.51	5.6		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.6	5.6		U
78-59-1	Isophorone	0.61	5.6		U
91-57-6	2-Methylnaphthalene	0.76	5.6		U
91-20-3	Naphthalene	0.50	5.6		U
95-48-7	2-Methylphenol	0.92	5.6		U
106-44-5	4-Methylphenol	0.86	5.6		U
88-74-4	2-Nitroaniline	1.3	22		U
99-09-2	3-Nitroaniline	1.2	22		UY
100-01-6	4-Nitroaniline	2.3	22		U
98-95-3	Nitrobenzene	0.69	5.6		U
88-75-5	2-Nitrophenol	0.82	5.6		U
100-02-7	4-Nitrophenol	0.92	22		UY
86-30-6	N-Nitrosodiphenylamine (1)	0.51	5.6		U
621-64-7	N-Nitroso-di-n-propylamine	1.0	5.6		U
87-86-5	Pentachlorophenol	1.1	22		U
108-95-2	Phenol	0.51	5.6		U
129-00-0	Pyrene	0.72	5.6		U
95-94-3	1,2,4,5-Tetrachlorobenzene	1.1	5.6		U
95-95-4	2,4,5-Trichlorophenol	0.56	5.6		U
88-06-2	2,4,6-Trichlorophenol	0.81	5.6		U

(1) - Cannot be separated from Diphenylamine

FORM 2
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Level:(low/med) LOW

	CLIENT SAMPLE NO.	S1 (2FP)#	S2 (PHL)#	S3 (NBZ)#	S4 (FBP)#	S5 (TBP)#	S6 (TPH)#	S7 #	S8 #	TOT OUT
01	SBLK0515BS1L	55	61	52	67	65	63			0
02	SBLK0515BS1L	52	55	49	59	52	59			0
03	SBLK0515BS1	56	58	48	54	44	52			0
04	1041SB003 (0	44	45	39	44*	45	49			1
05	1041SB001 (0	56	60	44	50	49	51			0
06	1034SB006 (0	50	55	41	53	61	65			0
07	1034DUP01 (0	62	64	51	61	64	66			0
08	1034SB007 (0	54	57	45	52	57	63			0
09										
10										
11										
12										
13										
14										
15										
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23										
24										
25										
26										
27										
28										
29										
30										

		EL QC LIMITS	SPIKE CONC (UG/KG)
S1 (2FP)	= 2-Fluorophenol	(35-105)	6700
S2 (PHL)	= Phenol-d6	(40-100)	6700
S3 (NBZ)	= Nitrobenzene-d5	(35-100)	3300
S4 (FBP)	= 2-Fluorobiphenyl	(45-105)	3300
S5 (TBP)	= 2,4,6-Tribromophenol	(35-125)	6700
S6 (TPH)	= Terphenyl-d14	(30-125)	3300

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate results reported from a diluted analysis

FORM 2
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

	CLIENT SAMPLE NO.	S1 (2FP) #	S2 (PHL) #	S3 (NBZ) #	S4 (FBP) #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	SBLK0512BW1	36	22	64	74	76	79			0
02	SBLK0512BW1L	39	23	70	78	82	78			0
03	1041HP004 (0	29	18	62	69	66	82			0
04	1041HP001 (0	42	32	59	62	62	66			0
05	1041HP003 (0	30	19	66	74	68	79			0
06	SBLK0515BW1	36	21	66	63	68	72			0
07	SBLK0515BW1L	39	22	70	74	76	78			0
08	EB001 (05102	35	21	64	72	72	84			0
09										
10										
11										
12										
13										
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29										
30										

	EL QC LIMITS	SPIKE CONC (UG/L)
S1 (2FP) = 2-Fluorophenol	(20-110)	100
S2 (PHL) = Phenol-d6	(10-115)	100
S3 (NBZ) = Nitrobenzene-d5	(40-110)	50
S4 (FBP) = 2-Fluorobiphenyl	(50-110)	50
S5 (TBP) = 2,4,6-Tribromophenol	(40-125)	100
S6 (TPH) = Terphenyl-d14	(50-135)	50

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate results reported from a diluted analysis

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0512BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
Acenaphthene	50.00	0.0000	46.01	92	45-110
Acenaphthylene	50.00	0.0000	44.06	88	50-105
Acetophenone	50.00	0.0000	35.18	70	50-110
Atrazine	50.00	0.0000	35.26	70	70-115
Anthracene	50.00	0.0000	44.72	89	55-110
Benzaldehyde	50.00	0.0000	36.74	73	10-180
Benzo(a)anthracene	50.00	0.0000	40.08	80	55-110
Benzo(b)fluoranthene	50.00	0.0000	42.63	85	45-120
Benzo(k)fluoranthene	50.00	0.0000	41.46	83	45-125
Benzo(g,h,i)perylene	50.00	0.0000	40.72	81	40-125
Benzo(a)pyrene	50.00	0.0000	43.34	87	55-110
1,1'-Biphenyl	50.00	0.0000	40.66	81	50-110
bis(2-Chloroethoxy)meth	50.00	0.0000	40.61	81	45-105
bis(2-Chloroethyl)ether	50.00	0.0000	38.48	77	35-110
bis(2-Chloroisopropyl)e	50.00	0.0000	39.67	79	25-130
Bis(2-ethylhexyl)phthal	50.00	0.0000	42.70	85	40-125
4-Bromophenyl-phenyleth	50.00	0.0000	35.71	71	50-115
Butylbenzylphthalate	50.00	0.0000	43.68	87	45-115
Caprolactam	50.00	0.9957	9.588	17*	20-110
Carbazole	50.00	0.0000	46.20	92	50-115
4-Chloroaniline	50.00	0.0000	36.52	73	15-110
4-Chloro-3-methylphenol	50.00	0.0000	44.04	88	45-110
2-Chloronaphthalene	50.00	0.0000	40.97	82	50-105
2-Chlorophenol	50.00	0.0000	39.47	79	35-105
4-Chlorophenyl-phenylet	50.00	0.0000	41.16	82	50-110
Chrysene	50.00	0.0000	41.21	82	55-110
Dibenz(a,h)anthracene	50.00	0.0000	38.54	77	40-125
Dibenzofuran	50.00	0.0000	42.33	85	55-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0512BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	50.00	0.0000	32.68	65	20-110
2,4-Dichlorophenol	50.00	0.0000	41.76	84	50-105
Diethylphthalate	50.00	0.0000	45.46	91	40-120
2,4-Dimethylphenol	50.00	0.0000	44.48	89	30-110
Dimethylphthalate	50.00	0.0000	41.23	82	25-125
Di-n-butylphthalate	50.00	0.0000	45.31	91	55-115
4,6-Dinitro-2-methylphe	50.00	0.0000	65.13	130	40-130
2,4-Dinitrophenol	50.00	0.0000	84.13	168*	15-140
2,4-Dinitrotoluene	50.00	0.0000	46.79	94	50-120
2,6-Dinitrotoluene	50.00	0.0000	44.02	88	50-115
Di-n-octylphthalate	50.00	0.0000	46.61	93	35-135
Fluoranthene	50.00	0.0000	42.02	84	55-115
Fluorene	50.00	0.0000	43.02	86	50-110
Hexachlorobenzene	50.00	0.0000	44.11	88	50-110
Hexachlorobutadiene	50.00	0.0000	33.43	67	25-105
Hexachlorocyclopentadie	50.00	0.0000	27.28	54	10-110
Hexachloroethane	50.00	0.0000	36.28	72	30- 95
Indeno(1,2,3-cd)pyrene	50.00	0.0000	30.67	61	45-125
Isophorone	50.00	0.0000	41.44	83	50-110
2-Methylnaphthalene	50.00	0.0000	42.00	84	45-105
Naphthalene	50.00	0.0000	40.18	80	40-100
2-Methylphenol	50.00	0.0000	35.68	71	40-110
4-Methylphenol	50.00	0.0000	32.03	64	30-110
2-Nitroaniline	50.00	0.0000	38.09	76	50-115
3-Nitroaniline	50.00	0.0000	41.89	84	20-125
4-Nitroaniline	50.00	0.0000	58.94	118	35-120
Nitrobenzene	50.00	0.0000	32.54	65	45-110
2-Nitrophenol	50.00	0.0000	47.61	95	40-115

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0512BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
4-Nitrophenol	50.00	0.0000	11.06	22	0-125
N-Nitrosodiphenylamine	50.00	0.0000	42.26	84	50-110
N-Nitroso-di-n-prop.(1)	50.00	0.0000	41.00	82	35-130
Pentachlorophenol	50.00	0.0000	51.42	103	40-115
Phenol	50.00	0.0000	14.06	28	0-115
Pyrene	50.00	0.0000	39.66	79	50-130
1,2,4,5-Tetrachlorobenz	50.00	0.0000	32.70	65	50-125
2,4,5-Trichlorophenol	50.00	0.0000	43.23	86	50-110
2,4,6-Trichlorophenol	50.00	0.0000	42.85	86	50-115

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 65 outside limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
Acenaphthene	3333	35.52	2750	81	45-110
Acenaphthylene	3333	28.43	2624	78	45-105
Acetophenone	3333	0.0000	1531	46	35-110
Atrazine	3333	0.0000	1902	57	55-105
Anthracene	3333	30.87	2669	79	55-105
Benzaldehyde	3333	0.0000	567.2	17	10-160
Benzo(a)anthracene	3333	0.0000	2384	72	50-110
Benzo(b)fluoranthene	3333	0.0000	2584	78	45-115
Benzo(k)fluoranthene	3333	0.0000	2160	65	45-125
Benzo(g,h,i)perylene	3333	0.0000	3352	100	40-125
Benzo(a)pyrene	3333	28.29	2618	78	50-110
1,1'-Biphenyl	3333	0.0000	2336	70	45-110
bis(2-Chloroethoxy)meth	3333	0.0000	2119	64	45-110
bis(2-Chloroethyl)ether	3333	0.0000	1757	53	40-105
bis(2-Chloroisopropyl)e	3333	0.0000	1889	57	20-115
Bis(2-ethylhexyl)phthal	3333	0.0000	2426	73	45-125
4-Bromophenyl-phenyleth	3333	0.0000	2051	62	45-115
Butylbenzylphthalate	3333	0.0000	2375	71	50-125
Caprolactam	3333	0.0000	2534	76	50-110
Carbazole	3333	0.0000	2828	85	45-115
4-Chloroaniline	3333	0.0000	2405	72	10- 95
4-Chloro-3-methylphenol	3333	0.0000	2714	81	45-115
2-Chloronaphthalene	3333	0.0000	2360	71	45-105
2-Chlorophenol	3333	0.0000	2113	63	45-105
4-Chlorophenyl-phenylet	3333	0.0000	2464	74	45-110
Chrysene	3333	34.07	2415	71	55-110
Dibenz(a,h)anthracene	3333	176.3	2981	84	40-125
Dibenzofuran	3333	30.35	2550	76	50-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	3333	0.0000	2245	67	19-130
2,4-Dichlorophenol	3333	0.0000	2407	72	45-110
Diethylphthalate	3333	37.82	2690	80	50-115
2,4-Dimethylphenol	3333	0.0000	2434	73	30-105
Dimethylphthalate	3333	0.0000	2345	70	50-110
Di-n-butylphthalate	3333	64.75	2679	78	55-110
4,6-Dinitro-2-methylphe	3333	0.0000	1435	43	30-135
2,4-Dinitrophenol	3333	0.0000	967.0	29	15-130
2,4-Dinitrotoluene	3333	0.0000	2818	84	50-115
2,6-Dinitrotoluene	3333	0.0000	2599	78	50-110
Di-n-octylphthalate	3333	29.21	2386	71	40-130
Fluoranthene	3333	0.0000	2642	79	55-115
Fluorene	3333	30.60	2628	78	50-110
Hexachlorobenzene	3333	0.0000	2608	78	45-120
Hexachlorobutadiene	3333	0.0000	1498	45	30-110
Hexachlorocyclopentadie	3333	0.0000	1105	33	10-110
Hexachloroethane	3333	0.0000	1411	42	35-110
Indeno(1,2,3-cd)pyrene	3333	158.2	3002	85	40-120
Isophorone	3333	0.0000	2158	65	45-110
2-Methylnaphthalene	3333	0.0000	2343	70	40-110
Naphthalene	3333	0.0000	2018	60	40-105
2-Methylphenol	3333	0.0000	2436	73	40-105
4-Methylphenol	3333	0.0000	2580	77	40-105
2-Nitroaniline	3333	0.0000	2306	69	45-120
3-Nitroaniline	3333	0.0000	2797	84	25-110
4-Nitroaniline	3333	0.0000	3821	115	35-115
Nitrobenzene	3333	0.0000	1654	50	40-115
2-Nitrophenol	3333	0.0000	2098	63	40-110

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BS1 Level: (low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
4-Nitrophenol	3333	0.0000	1863	56	15-140
N-Nitrosodiphenylamine	3333	0.0000	2451	74	50-115
N-Nitroso-di-n-prop.(1)	3333	0.0000	2171	65	40-115
Pentachlorophenol	3333	0.0000	1924	58	25-120
Phenol	3333	0.0000	2196	66	40-100
Pyrene	3333	0.0000	2091	63	45-125
1,2,4,5-Tetrachlorobenz	3333	0.0000	1835	55	50-150
2,4,5-Trichlorophenol	3333	0.0000	2446	73	50-110
2,4,6-Trichlorophenol	3333	0.0000	2278	68	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	LCSD CONCENTRATION (UG/KG)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acenaphthene	3333	2387	70	14	30	45-110
Acenaphthylene	3333	2300	68	13	30	45-105
Acetophenone	3333	1407	42	8	30	35-110
Atrazine	3333	1672	50*	13	30	55-105
Anthracene	3333	2320	69	14	30	55-105
Benzaldehyde	3333	355.0	11	46*	30	10-160
Benzo(a)anthracene	3333	2036	61	16	30	50-110
Benzo(b)fluoranthene	3333	2001	60	25	30	45-115
Benzo(k)fluoranthene	3333	2091	63	3	30	45-125
Benzo(g,h,i)perylene	3333	2461	74	31*	30	40-125
Benzo(a)pyrene	3333	2211	65	17	30	50-110
1,1'-Biphenyl	3333	2070	62	12	30	45-110
bis(2-Chloroethoxy)meth	3333	1954	59	8	30	45-110
bis(2-Chloroethyl)ether	3333	1699	51	3	30	40-105
bis(2-Chloroisopropyl)e	3333	1868	56	1	30	20-115
Bis(2-ethylhexyl)phthal	3333	2106	63	14	30	45-125
4-Bromophenyl-phenyleth	3333	1765	53	15	30	45-115
Butylbenzylphthalate	3333	2136	64	10	30	50-125
Caprolactam	3333	2392	72	6	30	50-110
Carbazole	3333	2404	72	16	30	45-115
4-Chloroaniline	3333	2153	64	11	30	10- 95
4-Chloro-3-methylphenol	3333	2233	67	19	30	45-115
2-Chloronaphthalene	3333	2058	62	14	30	45-105
2-Chlorophenol	3333	2024	61	4	30	45-105
4-Chlorophenyl-phenylet	3333	2053	62	18	30	45-110
Chrysene	3333	2092	62	14	30	55-110
Dibenz(a,h)anthracene	3333	2221	61	29	30	40-125
Dibenzofuran	3333	2194	65	15	30	50-105

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	LCSD CONCENTRATION (UG/KG)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
3,3'-Dichlorobenzidine	3333	1809	54	22	30	19-130
2,4-Dichlorophenol	3333	2097	63	14	30	45-110
Diethylphthalate	3333	2306	68	15	30	50-115
2,4-Dimethylphenol	3333	2151	64	12	30	30-105
Dimethylphthalate	3333	2085	62	12	30	50-110
Di-n-butylphthalate	3333	2373	69	12	30	55-110
4,6-Dinitro-2-methylphe	3333	1071	32	29	30	30-135
2,4-Dinitrophenol	3333	720.1	22	29	30	15-130
2,4-Dinitrotoluene	3333	2272	68	21	30	50-115
2,6-Dinitrotoluene	3333	2165	65	18	30	50-110
Di-n-octylphthalate	3333	2136	63	11	30	40-130
Fluoranthene	3333	2232	67	17	30	55-115
Fluorene	3333	2238	66	16	30	50-110
Hexachlorobenzene	3333	2224	67	16	30	45-120
Hexachlorobutadiene	3333	1508	45	1	30	30-110
Hexachlorocyclopentadie	3333	1001	30	10	30	10-110
Hexachloroethane	3333	1460	44	3	30	35-110
Indeno(1,2,3-cd)pyrene	3333	2251	63	28	30	40-120
Isophorone	3333	1987	60	8	30	45-110
2-Methylnaphthalene	3333	2108	63	10	30	40-110
Naphthalene	3333	1962	59	3	30	40-105
2-Methylphenol	3333	2203	66	10	30	40-105
4-Methylphenol	3333	2270	68	13	30	40-105
2-Nitroaniline	3333	1917	58	18	30	45-120
3-Nitroaniline	3333	2359	71	17	30	25-110
4-Nitroaniline	3333	3075	92	22	30	35-115
Nitrobenzene	3333	1572	47	5	30	40-115
2-Nitrophenol	3333	1982	59	6	30	40-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	LCSD CONCENTRATION (UG/KG)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
4-Nitrophenol	3333	1210	36	42*	30	15-140
N-Nitrosodiphenylamine	3333	2151	64	13	30	50-115
N-Nitroso-di-n-prop.(1)	3333	1961	59	10	30	40-115
Pentachlorophenol	3333	1179	35	48*	30	25-120
Phenol	3333	2034	61	8	30	40-100
Pyrene	3333	2031	61	3	30	45-125
1,2,4,5-Tetrachlorobenz	3333	1601	48*	14	30	50-150
2,4,5-Trichlorophenol	3333	1932	58	23	30	50-110
2,4,6-Trichlorophenol	3333	1760	53	26	30	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 4 out of 65 outside limits
Spike Recovery: 2 out of 130 outside limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
Acenaphthene	50.00	0.0000	43.94	88	45-110
Acenaphthylene	50.00	0.0000	42.82	86	50-105
Acetophenone	50.00	0.0000	34.56	69	50-110
Atrazine	50.00	0.0000	34.09	68*	70-115
Anthracene	50.00	0.0000	42.79	86	55-110
Benzaldehyde	50.00	0.0000	37.85	76	10-180
Benzo(a)anthracene	50.00	0.0000	38.34	77	55-110
Benzo(b)fluoranthene	50.00	0.0000	41.49	83	45-120
Benzo(k)fluoranthene	50.00	0.0000	39.86	80	45-125
Benzo(g,h,i)perylene	50.00	0.0000	47.32	95	40-125
Benzo(a)pyrene	50.00	0.0000	42.82	86	55-110
1,1'-Biphenyl	50.00	0.0000	39.28	78	50-110
bis(2-Chloroethoxy)meth	50.00	0.0000	40.24	80	45-105
bis(2-Chloroethyl)ether	50.00	0.0000	39.79	80	35-110
bis(2-Chloroisopropyl)e	50.00	0.0000	41.49	83	25-130
Bis(2-ethylhexyl)phthal	50.00	0.0000	42.46	85	40-125
4-Bromophenyl-phenyleth	50.00	0.0000	32.51	65	50-115
Butylbenzylphthalate	50.00	0.0000	43.37	87	45-115
Caprolactam	50.00	1.544	7.418	12*	20-110
Carbazole	50.00	0.0000	44.52	89	50-115
4-Chloroaniline	50.00	0.0000	35.65	71	15-110
4-Chloro-3-methylphenol	50.00	0.0000	41.18	82	45-110
2-Chloronaphthalene	50.00	0.0000	37.73	75	50-105
2-Chlorophenol	50.00	0.0000	39.31	79	35-105
4-Chlorophenyl-phenylet	50.00	0.0000	38.23	76	50-110
Chrysene	50.00	0.0000	39.99	80	55-110
Dibenz(a,h)anthracene	50.00	0.0000	42.41	85	40-125
Dibenzofuran	50.00	0.0000	40.25	80	55-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	50.00	0.0000	28.14	56	20-110
2,4-Dichlorophenol	50.00	0.0000	39.06	78	50-105
Diethylphthalate	50.00	0.0000	44.10	88	40-120
2,4-Dimethylphenol	50.00	0.0000	44.09	88	30-110
Dimethylphthalate	50.00	0.0000	40.16	80	25-125
Di-n-butylphthalate	50.00	0.0000	45.27	90	55-115
4,6-Dinitro-2-methylphe	50.00	0.0000	53.38	107	40-130
2,4-Dinitrophenol	50.00	0.0000	57.10	114	15-140
2,4-Dinitrotoluene	50.00	0.0000	43.78	88	50-120
2,6-Dinitrotoluene	50.00	0.0000	40.83	82	50-115
Di-n-octylphthalate	50.00	0.0000	47.08	94	35-135
Fluoranthene	50.00	0.0000	41.51	83	55-115
Fluorene	50.00	0.0000	41.30	83	50-110
Hexachlorobenzene	50.00	0.0000	41.03	82	50-110
Hexachlorobutadiene	50.00	0.0000	25.67	51	25-105
Hexachlorocyclopentadie	50.00	0.0000	18.44	37	10-110
Hexachloroethane	50.00	0.0000	27.32	55	30- 95
Indeno(1,2,3-cd)pyrene	50.00	0.0000	42.36	85	45-125
Isophorone	50.00	0.0000	40.79	82	50-110
2-Methylnaphthalene	50.00	0.0000	37.38	75	45-105
Naphthalene	50.00	0.0000	35.63	71	40-100
2-Methylphenol	50.00	0.0000	35.13	70	40-110
4-Methylphenol	50.00	0.0000	31.44	63	30-110
2-Nitroaniline	50.00	0.0000	36.78	74	50-115
3-Nitroaniline	50.00	0.0000	37.80	76	20-125
4-Nitroaniline	50.00	0.0000	49.94	100	35-120
Nitrobenzene	50.00	0.0000	33.34	67	45-110
2-Nitrophenol	50.00	0.0000	45.39	91	40-115

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: SBLK0515BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
4-Nitrophenol	50.00	0.0000	8.061	16	0-125
N-Nitrosodiphenylamine	50.00	0.0000	39.84	80	50-110
N-Nitroso-di-n-prop.(1)	50.00	0.0000	41.58	83	35-130
Pentachlorophenol	50.00	0.0000	38.52	77	40-115
Phenol	50.00	0.0000	13.86	28	0-115
Pyrene	50.00	0.0000	39.64	79	50-130
1,2,4,5-Tetrachlorobenz	50.00	0.0000	30.09	60	50-125
2,4,5-Trichlorophenol	50.00	0.0000	38.45	77	50-110
2,4,6-Trichlorophenol	50.00	0.0000	38.55	77	50-115

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 65 outside limits

COMMENTS: _____

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0512BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: S1BW0512 Lab Sample ID: SBLK0512BW1

Instrument ID: BNA3 Date Extracted: 05/12/08

Matrix: (soil/water) WATER Date Analyzed: 05/12/08

Level: (low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1409

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0512BW1L	SBLK0512BW1LCS	S1LW0512	05/12/08
02	1041HP004 (0	0805104-01	0510401	05/13/08
03	1041HP001 (0	0805104-02	0510402	05/13/08
04	1041HP003 (0	0805104-03	0510403	05/13/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0512BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: SBLK0512BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0512

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/12/08 14:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.63	5.0		U
208-96-8	Acenaphthylene	0.47	5.0		U
98-86-2	Acetophenone	0.75	5.0		U
1912-24-9	Atrazine	0.69	5.0		UY
120-12-7	Anthracene	0.77	5.0		U
100-52-7	Benzaldehyde	0.57	5.0		UY
56-55-3	Benzo(a)anthracene	0.91	5.0		U
205-99-2	Benzo(b)fluoranthene	0.71	5.0		U
207-08-9	Benzo(k)fluoranthene	0.50	5.0		U
191-24-2	Benzo(g,h,i)perylene	1.5	5.0		U
50-32-8	Benzo(a)pyrene	0.60	2.0		U
92-52-4	1,1'-Biphenyl	0.39	5.0		U
111-91-1	bis(2-Chloroethoxy)methane	0.52	5.0		U
111-44-4	bis(2-Chloroethyl)ether	0.45	5.0		U
108-60-1	bis(2-Chloroisopropyl)ether	0.85	5.0		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.3	5.0		U
101-55-3	4-Bromophenyl-phenylether	0.57	5.0		U
85-68-7	Butylbenzylphthalate	0.82	5.0		U
105-60-2	Caprolactam	0.36	5.0	1.00	J
86-74-8	Carbazole	0.69	5.0		UY
106-47-8	4-Chloroaniline	0.95	5.0		U
59-50-7	4-Chloro-3-methylphenol	0.58	5.0		U
91-58-7	2-Chloronaphthalene	0.58	5.0		U
95-57-8	2-Chlorophenol	0.59	5.0		U
7005-72-3	4-Chlorophenyl-phenylether	0.89	5.0		U
218-01-9	Chrysene	1.0	5.0		U
53-70-3	Dibenz(a,h)anthracene	1.7	5.0		U
132-64-9	Dibenzofuran	0.65	5.0		U
91-94-1	3,3'-Dichlorobenzidine	0.89	5.0		UY
120-83-2	2,4-Dichlorophenol	0.44	5.0		U
84-66-2	Diethylphthalate	1.0	5.0		U
105-67-9	2,4-Dimethylphenol	0.71	20		U
131-11-3	Dimethylphthalate	0.74	5.0		U

AO
6/3/08

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0512BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: SBLK0512BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0512

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/12/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/12/08 14:09

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.3	5.0		U
534-52-1	4,6-Dinitro-2-methylphenol	0.74	20		U
51-28-5	2,4-Dinitrophenol	0.85	50		U
121-14-2	2,4-Dinitrotoluene	0.49	5.0		U
606-20-2	2,6-Dinitrotoluene	0.66	5.0		U
117-84-0	Di-n-octylphthalate	0.33	5.0		U
206-44-0	Fluoranthene	0.70	5.0		U
86-73-7	Fluorene	0.55	5.0		U
118-74-1	Hexachlorobenzene	0.47	5.0		U
87-68-3	Hexachlorobutadiene	0.93	5.0		U
77-47-4	Hexachlorocyclopentadiene	0.89	5.0		UY
67-72-1	Hexachloroethane	0.46	5.0		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.4	5.0		UY
78-59-1	Isophorone	0.55	5.0		U
91-57-6	2-Methylnaphthalene	0.68	5.0		U
91-20-3	Naphthalene	0.45	5.0		U
95-48-7	2-Methylphenol	0.83	5.0		U
106-44-5	4-Methylphenol	0.77	5.0		U
88-74-4	2-Nitroaniline	1.2	20		U
99-09-2	3-Nitroaniline	1.0	20		U
100-01-6	4-Nitroaniline	2.0	20		U
98-95-3	Nitrobenzene	0.62	5.0		U
88-75-5	2-Nitrophenol	0.74	5.0		U
100-02-7	4-Nitrophenol	0.83	20		U
86-30-6	N-Nitrosodiphenylamine (1)	0.46	5.0		U
621-64-7	N-Nitroso-di-n-propylamine	0.90	5.0		U
87-86-5	Pentachlorophenol	1.0	20		U
108-95-2	Phenol	0.46	5.0		U
129-00-0	Pyrene	0.65	5.0		U
95-94-3	1,2,4,5-Tetrachlorobenzene	1.0	5.0		U
95-95-4	2,4,5-Trichlorophenol	0.50	5.0		U
88-06-2	2,4,6-Trichlorophenol	0.73	5.0		U

(1) - Cannot be separated from Diphenylamine

RV 6/3/08

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0515BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: S1BS0515 Lab Sample ID: SBLK0515BS1

Instrument ID: BNA3 Date Extracted: 05/15/08

Matrix: (soil/water) SOIL Date Analyzed: 05/15/08

Level: (low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1229

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0515BS1L	SBLK0515BS1LCS	S1LS0515	05/15/08
02	SBLK0515BS1L	SBLK0515BS1LCS	S1DS0515	05/15/08
03	1041SB003 (0	0805104-05	0510405	05/15/08
04	1041SB001 (0	0805104-06	0510406	05/15/08
05	1034SB006 (0	0805104-07	0510407	05/15/08
06	1034DUP01 (0	0805104-08	0510408	05/15/08
07	1034SB007 (0	0805104-09	0510409	05/15/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0515BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0515BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0515

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 12:29

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	26	330	36	J
208-96-8	Acenaphthylene	20	330	28	J
98-86-2	Acetophenone	41	330		U
1912-24-9	Atrazine	28	330		UY
120-12-7	Anthracene	27	330	31	J
100-52-7	Benzaldehyde	55	330		UY
56-55-3	Benzo(a)anthracene	36	130		U
205-99-2	Benzo(b)fluoranthene	32	130		U
207-08-9	Benzo(k)fluoranthene	39	330		U
191-24-2	Benzo(g,h,i)perylene	70	330		U
50-32-8	Benzo(a)pyrene	23	130	28	J
92-52-4	1,1'-Biphenyl	29	330		U
111-91-1	bis(2-Chloroethoxy)methane	31	330		U
111-44-4	bis(2-Chloroethyl)ether	41	330		U
108-60-1	bis(2-Chloroisopropyl)ether	51	330		U
117-81-7	Bis(2-ethylhexyl)phthalate	36	330		U
101-55-3	4-Bromophenyl-phenylether	26	330		U
85-68-7	Butylbenzylphthalate	30	330		U
105-60-2	Caprolactam	67	330		U
86-74-8	Carbazole	36	330		UY
106-47-8	4-Chloroaniline	48	330		UY
59-50-7	4-Chloro-3-methylphenol	28	330		U
91-58-7	2-Chloronaphthalene	32	330		U
95-57-8	2-Chlorophenol	41	330		U
7005-72-3	4-Chlorophenyl-phenylether	31	330		U
218-01-9	Chrysene	31	330	34	J
53-70-3	Dibenz(a,h)anthracene	60	130	180	
132-64-9	Dibenzofuran	24	330	30	J
91-94-1	3,3'-Dichlorobenzidine	31	330		UY
120-83-2	2,4-Dichlorophenol	19	330		U
84-66-2	Diethylphthalate	34	330	38	J
105-67-9	2,4-Dimethylphenol	21	1300		U
131-11-3	Dimethylphthalate	30	330		U

6/13/08

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0515BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0515BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0515

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 12:29

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	30	330	65	J
534-52-1	4,6-Dinitro-2-methylphenol	22	1300		U
51-28-5	2,4-Dinitrophenol	130	1300		U
121-14-2	2,4-Dinitrotoluene	24	330		U
606-20-2	2,6-Dinitrotoluene	38	330		U
117-84-0	Di-n-octylphthalate	27	330	29	J
206-44-0	Fluoranthene	54	330		U
86-73-7	Fluorene	26	330	31	J
118-74-1	Hexachlorobenzene	35	330		U
87-68-3	Hexachlorobutadiene	33	330		U
77-47-4	Hexachlorocyclopentadiene	61	330		UY
67-72-1	Hexachloroethane	39	330		U
193-39-5	Indeno(1,2,3-cd)pyrene	46	130	160	
78-59-1	Isophorone	28	330		U
91-57-6	2-Methylnaphthalene	35	330		U
91-20-3	Naphthalene	32	330		U
95-48-7	2-Methylphenol	39	330		U
106-44-5	4-Methylphenol	26	330		U
88-74-4	2-Nitroaniline	32	1300		U
99-09-2	3-Nitroaniline	47	1300		UY
100-01-6	4-Nitroaniline	100	1300		U
98-95-3	Nitrobenzene	34	330		U
88-75-5	2-Nitrophenol	22	330		U
100-02-7	4-Nitrophenol	81	1300		UY
86-30-6	N-Nitrosodiphenylamine (1)	32	330		U
621-64-7	N-Nitroso-di-n-propylamine	55	330		U
87-86-5	Pentachlorophenol	34	1300		U
108-95-2	Phenol	36	330		U
129-00-0	Pyrene	40	330		U
95-94-3	1,2,4,5-Tetrachlorobenzene	100	330		U
95-95-4	2,4,5-Trichlorophenol	27	330		U
88-06-2	2,4,6-Trichlorophenol	35	330		U

(1) - Cannot be separated from Diphenylamine

6/3/08

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0515BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: S1BW0515 Lab Sample ID: SBLK0515BW1

Instrument ID: BNA3 Date Extracted: 05/15/08

Matrix: (soil/water) WATER Date Analyzed: 05/15/08

Level: (low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1511

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0515BW1L	SBLK0515BW1LCS	S1LW0515	05/15/08
02	EB001 (05102	0805115-06	0511506	05/15/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0515BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: SBLK0515BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0515

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 15:11

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.63	5.0		U
208-96-8	Acenaphthylene	0.47	5.0		U
98-86-2	Acetophenone	0.75	5.0		U
1912-24-9	Atrazine	0.69	5.0		UY
120-12-7	Anthracene	0.77	5.0		U
100-52-7	Benzaldehyde	0.57	5.0		UY
56-55-3	Benzo(a)anthracene	0.91	5.0		U
205-99-2	Benzo(b)fluoranthene	0.71	5.0		U
207-08-9	Benzo(k)fluoranthene	0.50	5.0		U
191-24-2	Benzo(g,h,i)perylene	1.5	5.0		U
50-32-8	Benzo(a)pyrene	0.60	2.0		U
92-52-4	1,1'-Biphenyl	0.39	5.0		U
111-91-1	bis(2-Chloroethoxy)methane	0.52	5.0		U
111-44-4	bis(2-Chloroethyl)ether	0.45	5.0		U
108-60-1	bis(2-Chloroisopropyl)ether	0.85	5.0		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.3	5.0		U
101-55-3	4-Bromophenyl-phenylether	0.57	5.0		U
85-68-7	Butylbenzylphthalate	0.82	5.0		U
105-60-2	Caprolactam	0.36	5.0	1.5	J
86-74-8	Carbazole	0.69	5.0		UY
106-47-8	4-Chloroaniline	0.95	5.0		UY
59-50-7	4-Chloro-3-methylphenol	0.58	5.0		U
91-58-7	2-Chloronaphthalene	0.58	5.0		U
95-57-8	2-Chlorophenol	0.59	5.0		U
7005-72-3	4-Chlorophenyl-phenylether	0.89	5.0		U
218-01-9	Chrysene	1.0	5.0		U
53-70-3	Dibenz(a,h)anthracene	1.7	5.0		U
132-64-9	Dibenzofuran	0.65	5.0		U
91-94-1	3,3'-Dichlorobenzidine	0.89	5.0		UY
120-83-2	2,4-Dichlorophenol	0.44	5.0		U
84-66-2	Diethylphthalate	1.0	5.0		U
105-67-9	2,4-Dimethylphenol	0.71	20		U
131-11-3	Dimethylphthalate	0.74	5.0		U

2
5/28/08

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0515BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: SBLK0515BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0515

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/15/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 05/15/08 15:11

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.3	5.0		U
534-52-1	4,6-Dinitro-2-methylphenol	0.74	20		U
51-28-5	2,4-Dinitrophenol	0.85	50		U
121-14-2	2,4-Dinitrotoluene	0.49	5.0		U
606-20-2	2,6-Dinitrotoluene	0.66	5.0		U
117-84-0	Di-n-octylphthalate	0.33	5.0		U
206-44-0	Fluoranthene	0.70	5.0		U
86-73-7	Fluorene	0.55	5.0		U
118-74-1	Hexachlorobenzene	0.47	5.0		U
87-68-3	Hexachlorobutadiene	0.93	5.0		U
77-47-4	Hexachlorocyclopentadiene	0.89	5.0		U Y
67-72-1	Hexachloroethane	0.46	5.0		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.4	5.0		U
78-59-1	Isophorone	0.55	5.0		U
91-57-6	2-Methylnaphthalene	0.68	5.0		U
91-20-3	Naphthalene	0.45	5.0		U
95-48-7	2-Methylphenol	0.83	5.0		U
106-44-5	4-Methylphenol	0.77	5.0		U
88-74-4	2-Nitroaniline	1.2	20		U
99-09-2	3-Nitroaniline	1.0	20		U Y
100-01-6	4-Nitroaniline	2.0	20		U
98-95-3	Nitrobenzene	0.62	5.0		U
88-75-5	2-Nitrophenol	0.74	5.0		U
100-02-7	4-Nitrophenol	0.83	20		U Y
86-30-6	N-Nitrosodiphenylamine (1)	0.46	5.0		U
621-64-7	N-Nitroso-di-n-propylamine	0.90	5.0		U
87-86-5	Pentachlorophenol	1.0	20		U
108-95-2	Phenol	0.46	5.0		U
129-00-0	Pyrene	0.65	5.0		U
95-94-3	1,2,4,5-Tetrachlorobenzene	1.0	5.0		U
95-95-4	2,4,5-Trichlorophenol	0.50	5.0		U
88-06-2	2,4,6-Trichlorophenol	0.73	5.0		U

(1) - Cannot be separated from Diphenylamine

MD 6/18/08

FORM 5

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA96567

Lab File ID: DF0516B1 DFTPP Injection Date: 05/16/07

Instrument ID: BNA3 DFTPP Injection Time: 1155

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	45.0
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	47.6
70	Less than 2.0% of mass 69	0.2 (0.3)1
127	40.0 - 60.0% of mass 198	50.9
197	Less than 1.0% of mass 198	0.3
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.0
275	10.0 - 30.0% of mass 198	27.2
365	Greater than 1.0% of mass 198	3.21
441	Present, but less than mass 443	10.4
442	Greater than 40.0% of mass 198	65.8
443	17.0 - 23.0% of mass 442	12.0 (18.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACAL100PPM	BNACAL100PPM	CAL100	05/16/07	1218
02	BNACAL90PPM	BNACAL90PPM	CAL090	05/16/07	1247
03	BNACAL80PPM	BNACAL80PPM	CAL080	05/16/07	1317
04	BNACAL60PPM	BNACAL60PPM	CAL060	05/16/07	1417
05	BNACAL50PPM	BNACAL50PPM	CAL050	05/16/07	1447
06	BNACAL40PPM	BNACAL40PPM	CAL040	05/16/07	1517
07	BNACAL30PPM	BNACAL30PPM	CAL030	05/16/07	1546
08	BNACAL20PPM	BNACAL20PPM	CAL020	05/16/07	1616
09	BNACAL10PPM	BNACAL10PPM	CAL010	05/16/07	1645
10	BNACAL5PPM	BNACAL5PPM	CAL005	05/16/07	1715
11	BNACAL2PPM	BNACAL2PPM	CAL002	05/16/07	1744
12	BNACAL1PPM	BNACAL1PPM	CAL001	05/16/07	1813
13		BNACAL2PPM	CALB002	05/16/07	1843
14		BNACAL5PPM	CALB005	05/16/07	1912
15		BNACAL10PPM	CALB010	05/16/07	1941
16		BNACAL20PPM	CALB020	05/16/07	2011
17		BNACAL30PPM	CALB030	05/16/07	2039
18		BNACAL30PPM	CALB040	05/16/07	2108
19		BNACAL50PPM	CALB050	05/16/07	2137
20		BNACAL60PPM	CALB060	05/16/07	2206
21		BNACAL70PPM	CALB070	05/16/07	2235
22					

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA96567

Lab File ID: DF0516B2 DFTPP Injection Date: 05/16/07

Instrument ID: BNA3 DFTPP Injection Time: 2256

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	46.3
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	49.2
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	40.0 - 60.0% of mass 198	52.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.1
275	10.0 - 30.0% of mass 198	25.8
365	Greater than 1.0% of mass 198	2.99
441	Present, but less than mass 443	8.7
442	Greater than 40.0% of mass 198	55.3
443	17.0 - 23.0% of mass 442	10.3 (18.6)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		BNACAL80PPM	CALB080	05/16/07	2319
02		BNACAL90PPM	CALB090	05/16/07	2348
03		BNACAL100PPM	CALB100	05/17/07	0017
04		BNACAL002PPM	CALA002	05/17/07	0046
05		BNACAL005PPM	CALA005	05/17/07	0114
06		BNACAL010PPM	CALA010	05/17/07	0143
07		BNACAL020PPM	CALA020	05/17/07	0212
08		BNACAL030PPM	CALA030	05/17/07	0240
09		BNACAL050PPM	CALA050	05/17/07	0309
10		BNACAL070PPM	CALA070	05/17/07	0337
11		BNACAL100PPM	CALA100	05/17/07	0406
12		BNAICV-050PPM	ICV03	05/17/07	0601
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA36819

Lab File ID: DF0108B1 DFTPP Injection Date: 01/08/08

Instrument ID: BNA3 DFTPP Injection Time: 1200

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	35.5
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	40.5
70	Less than 2.0% of mass 69	0.2 (0.6)1
127	40.0 - 60.0% of mass 198	49.7
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	28.1
365	Greater than 1.0% of mass 198	3.65
441	Present, but less than mass 443	11.5
442	Greater than 40.0% of mass 198	74.2
443	17.0 - 23.0% of mass 442	14.4 (19.4)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	2CMPCAL100PP	2CMPCAL100PPM	2CPCAL13	01/08/08	1306
02	2CMPCAL70PPM	2CMPCAL70PPM	2CPCAL10	01/08/08	1339
03	2CMPCAL50PPM	2CMPCAL50PPM	2CPCAL08	01/08/08	1413
04	2CMPCAL20PPM	2CMPCAL20PPM	2CPCAL05	01/08/08	1446
05	2CMPCAL10PPM	2CMPCAL10PPM	2CPCAL04	01/08/08	1519
06	2CMPCAL5PPM	2CMPCAL5PPM	2CPCAL03	01/08/08	1551
07	2CMPCAL2PPM	2CMPCAL2PPM	2CPCAL02	01/08/08	1624
08	2CMPCAL1PPM	2CMPCAL1PPM	2CPCAL01	01/08/08	1657
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: DF0512B1 DFTPP Injection Date: 05/12/08

Instrument ID: BNA3 DFTPP Injection Time: 0945

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	40.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	46.5
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	40.0 - 60.0% of mass 198	52.9
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	28.2
365	Greater than 1.0% of mass 198	3.70
441	Present, but less than mass 443	12.2
442	Greater than 40.0% of mass 198	76.9
443	17.0 - 23.0% of mass 442	15.1 (19.7)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACCV50PPM	BNACCV50PPM	CCV050	05/12/08	1006
02	SBLK0512BW1	SBLK0512BW1	S1BW0512	05/12/08	1409
03	SBLK0512BW1L	SBLK0512BW1LCS	S1LW0512	05/12/08	1436
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: DF0513B1 DFTPP Injection Date: 05/13/08

Instrument ID: BNA3 DFTPP Injection Time: 0940

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	43.2
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	47.9
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	40.0 - 60.0% of mass 198	54.1
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	27.8
365	Greater than 1.0% of mass 198	3.39
441	Present, but less than mass 443	11.4
442	Greater than 40.0% of mass 198	72.8
443	17.0 - 23.0% of mass 442	14.1 (19.4)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACCV50PPM	BNACCV50PPM	CCV050W	05/13/08	1115
02	1041HP004 (0	0805104-01	0510401	05/13/08	1756
03	1041HP001 (0	0805104-02	0510402	05/13/08	1823
04	1041HP003 (0	0805104-03	0510403	05/13/08	1849
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID: DF0515B1 DFTPP Injection Date: 05/15/08

Instrument ID: BNA3 DFTPP Injection Time: 1037

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	45.5
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	49.7
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	40.0 - 60.0% of mass 198	54.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.3
275	10.0 - 30.0% of mass 198	25.6
365	Greater than 1.0% of mass 198	3.08
441	Present, but less than mass 443	9.0
442	Greater than 40.0% of mass 198	57.0
443	17.0 - 23.0% of mass 442	11.1 (19.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACCV50PPM	BNACCV50PPM	CCV050S	05/15/08	1058
02	SBLK0515BS1L	SBLK0515BS1LCS	S1LS0515	05/15/08	1133
03	SBLK0515BS1L	SBLK0515BS1LCS	S1DS0515	05/15/08	1202
04	SBLK0515BS1	SBLK0515BS1	S1BS0515	05/15/08	1229
05	1041SB003 (0	0805104-05	0510405	05/15/08	1256
06	1041SB001 (0	0805104-06	0510406	05/15/08	1323
07	1034SB006 (0	0805104-07	0510407	05/15/08	1349
08	1034DUP01 (0	0805104-08	0510408	05/15/08	1417
09	1034SB007 (0	0805104-09	0510409	05/15/08	1444
10	SBLK0515BW1	SBLK0515BW1	S1BW0515	05/15/08	1511
11	SBLK0515BW1L	SBLK0515BW1LCS	S1LW0515	05/15/08	1538
12	EB001 (05102	0805115-06	0511506	05/15/08	1605
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FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): CCV050 Date Analyzed: 05/12/08

Instrument ID: BNA3 Time Analyzed: 1006

		IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
	12 HOUR STD	917220	3.69	3467361	5.00	1893442	6.91
	UPPER LIMIT	1834440	4.19	6934722	5.50	3786884	7.41
	LOWER LIMIT	458610	3.19	1733681	4.50	946721	6.41
	CLIENT SAMPLE NO.						
01	SBLK0512BW1	1107201	3.69	4063695	4.99	2197593	6.91
02	SBLK0512BW1L	1127435	3.69	4276474	5.00	2397663	6.91
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IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): CCV050 Date Analyzed: 05/12/08

Instrument ID: BNA3 Time Analyzed: 1006

		IS4 (PHN) AREA	#	RT	#	IS5 (CRY) AREA	#	RT	#	IS6 (PRY) AREA	#	RT	#
	12 HOUR STD	3030549		8.52		2625926		11.35		1980773		12.68	
	UPPER LIMIT	6061098		9.02		5251852		11.85		3961546		13.18	
	LOWER LIMIT	1515275		8.02		1312963		10.85		990387		12.18	
	CLIENT SAMPLE NO.												
01	SBLK0512BW1	3372277		8.52		2871298		11.34		2046513		12.67	
02	SBLK0512BW1L	3771523		8.52		3188002		11.35		2229295		12.68	
03													
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IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): CCV050W Date Analyzed: 05/13/08

Instrument ID: BNA3 Time Analyzed: 1115

		IS1 (DCB) AREA	#	RT	#	IS2 (NPT) AREA	#	RT	#	IS3 (ANT) AREA	#	RT	#
	12 HOUR STD	1180188		3.68		4430055		4.99		2447513		6.90	
	UPPER LIMIT	2360376		4.18		8860110		5.49		4895026		7.40	
	LOWER LIMIT	590094		3.18		2215028		4.49		1223757		6.40	
	CLIENT SAMPLE NO.												
01	1041HP004 (0	1096894		3.68		4023129		4.98		2198964		6.90	
02	1041HP001 (0	1229938		3.69		4505341		4.98		2517785		6.90	
03	1041HP003 (0	1250052		3.68		4580531		4.98		2460563		6.90	
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22													

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): CCV050W Date Analyzed: 05/13/08

Instrument ID: BNA3 Time Analyzed: 1115

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	3915133	8.52	3636611	11.34	2664289	12.67
	UPPER LIMIT	7830266	9.02	7273222	11.84	5328578	13.17
	LOWER LIMIT	1957567	8.02	1818306	10.84	1332145	12.17
	CLIENT SAMPLE NO.						
01	1041HP004 (0	3425560	8.51	2825092	11.34	1764249	12.66
02	1041HP001 (0	3997153	8.51	3555799	11.34	2578337	12.66
03	1041HP003 (0	3818391	8.51	3052185	11.34	1959685	12.67
04							
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22							

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): CCV050S Date Analyzed: 05/15/08

Instrument ID: BNA3 Time Analyzed: 1058

		IS1 (DCB) AREA	#	RT	#	IS2 (NPT) AREA	#	RT	#	IS3 (ANT) AREA	#	RT	#
	12 HOUR STD	730792		3.66		2749636		4.96		1504048		6.88	
	UPPER LIMIT	1461584		4.16		5499272		5.46		3008096		7.38	
	LOWER LIMIT	365396		3.16		1374818		4.46		752024		6.38	
	CLIENT SAMPLE NO.												
01	SBLK0515BS1L	1180080		3.66		4547172		4.97		2595271		6.88	
02	SBLK0515BS1L	1035719		3.67		3871275		4.97		2176489		6.89	
03	SBLK0515BS1	1087379		3.66		4098122		4.96		2197344		6.88	
04	1041SB003 (0	979148		3.67		3564438		4.96		1941220		6.88	
05	1041SB001 (0	843767		3.67		3192701		4.96		1703573		6.88	
06	1034SB006 (0	1031561		3.67		3866493		4.96		2088980		6.88	
07	1034DUP01 (0	1194518		3.67		4466808		4.97		2411756		6.88	
08	1034SB007 (0	1014486		3.67		3824750		4.96		2029876		6.88	
09	SBLK0515BW1	961792		3.67		3550671		4.96		1903391		6.88	
10	SBLK0515BW1L	807614		3.66		3080033		4.97		1717618		6.88	
11	EB001 (05102	933226		3.67		3489514		4.96		1837566		6.88	
12													
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22													

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD002

Lab File ID (Standard): CCV050S Date Analyzed: 05/15/08

Instrument ID: BNA3 Time Analyzed: 1058

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	2347780	8.49	1773610	11.32	1125232	12.64
	UPPER LIMIT	4695560	8.99	3547220	11.82	2250464	13.14
	LOWER LIMIT	1173890	7.99	886805	10.82	562616	12.14
	CLIENT SAMPLE NO.						
01	SBLK0515BS1L	4238750	8.50	4315370*	11.33	3585979*	12.65
02	SBLK0515BS1L	3381651	8.49	2991656	11.32	2259395*	12.65
03	SBLK0515BS1	3450107	8.49	3641717*	11.32	3304461*	12.65
04	1041SB003 (0	2840538	8.49	2432305	11.32	1921415	12.65
05	1041SB001 (0	2541224	8.49	2270064	11.32	1856752	12.64
06	1034SB006 (0	3241413	8.49	2927853	11.32	2282724*	12.64
07	1034DUP01 (0	3747499	8.49	3248502	11.32	2508044*	12.65
08	1034SB007 (0	3084422	8.49	2551364	11.32	1862946	12.65
09	SBLK0515BW1	2957045	8.49	2614761	11.32	1857925	12.64
10	SBLK0515BW1L	2707928	8.49	2284988	11.32	1484414	12.65
11	EB001 (05102	2767566	8.49	2169746	11.32	1506522	12.65
12							
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20							
21							
22							

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
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RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

PCB SECTION

ORGANIC CASE NARRATIVE - PCBs
Arcadis – Radford002

Date Sampled	Date Received	Lab ID	Client ID	TAT/SDG
05/09/08	05/10/08	0805104-01	1041HP004 (050908)	X
05/09/08	05/10/08	0805104-02	1041HP001 (050908)	X
05/09/08	05/10/08	0805104-03	1041HP003 (050908)	X
05/09/08	05/10/08	0805104-05	1041SB003 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-06	1041SB001 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-07	1034SB006 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-08	1034DUP01 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-09	1034SB007 (0.5-1.5)	4BD
05/09/08	05/10/08	0805105-01	1041SB003 (7-8)	Radford003
05/09/08	05/10/08	0805105-02	1041SB001 (7-8)	Radford003
05/09/08	05/10/08	0805105-03	1034SB006 (7-8)	Radford003
05/09/08	05/10/08	0805105-04	1034SB007 (7-8)	Radford003
05/10/08	05/13/08	0805115-04	1549 HP008 (05102008)	X* 150ml-1.5ml
05/10/08	05/13/08	0805115-06	EB001 (05102008)	X

Method: The samples were extracted/analyzed by USEPA SW-846 Methods 3541/8082 or 3510C/8082 (automated soxhlet or separatory funnel extraction followed by dual capillary column GC/ECD) for soils or waters upon receipt to the laboratory in satisfactory condition.
Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction was requested 5/19/08 for samples reflected as SDG Radford003 but analysis is still pending request from the client. E-mail instructions are attached.
- Note2: Limited sample volume was received for sample 1549 HP008 (05102008). After centrifuging to determine actual amount of sample received, client instructed that the PCB be extracted 150ml-1.5ml. E-mail instructions are attached.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded as indicated in the following clarifications:
- ECD4 RTX-CLP2 PCB-1254 CCV analyzed 5/16/08 at 23:35 exceeded 20% difference with a negative bias at 20.8%. Results are non-detect for PCB-1254 on the RTX-CLP column, less than the quantitation limits or reported from the RTX-CLP column.
- ECD4 CCVs analyzed 5/18/08 at 06:43 exceeded 20% difference with a positive bias on the RTX-CLP and RTX-CLP2 columns. Results in the associated samples are non-detect. Surrogate recoveries were evaluated and determined not to have been biased into control by the exceedences.
- Blank Results: PCB-1260 was detected in method blank PS1BLK0514. Reported concentrations in the associated samples are qualified with a "B".
- Surrogate Recoveries: Recovery of the surrogate DCB exceeded the limit of 130% at 131% in the RTX-CLP2 column analysis of sample 1549 HP008(05102008). Recovery of the surrogate TCMX exceeded the limit of 120% at 255%, 518% and 138% in the RTX-CLP column analyses of samples 1041HP003 (05092008), 1549 HP008(05102008) and 1041HP001 (05092008). All other recoveries were within limits.
- LCS/LCSD Results: All recoveries and relative percent differences were within limits.

- MS/MSD results: Not applicable.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.



Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, May 14, 2008 1:41 PM
To: MMcGinnity@EmpirLabs.com
Cc: Powell, Jace'que; Borne, Rachelle
Subject: RE: 1150ml of sample.....1549HP008(05102008)

Marcia

op the SVOC analysis request for these samples and perform the Explosives and the PCBs. This should give you the ll 1 liter for the explosives

anks
ne

ne Kennedy
inciple Scientist
RCADIS US, Inc.
50 N. Causeway Blvd.
iite 1600
etairie, LA 70002
ione: (504) 832-4174 Ext 106
ell: (225) 205-8256
mail: jane.kennedy@arcadis-us.com

om: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
nt: Wednesday, May 14, 2008 1:08 PM
: Kennedy, Jane
bject: RE: 1150ml of sample.....

otcha - they are holding extraction batches for these....if there's anything you can do to get them to cide! ;)

anks,
arcia

From: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
Sent: Wednesday, May 14, 2008 12:34 PM
To: Kennedy, Jane
Subject: RE: 1150ml of sample.....

1549HP008(05102008)

Thanks,
Marcia

-----Original Message-----
From: Kennedy, Jane [mailto:Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, May 14, 2008 12:13 PM
To: MMcGinnity@EmpirLabs.com

Subject: RE: 1150ml of sample.....

Can you send me the sample ID again? I don't think the first part of the ID is correct

Jane Kennedy

Principle Scientist
ARCADIS US, Inc.
3850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002

Phone: (504) 832-4174 Ext 106
Cell: (225) 205-8256
e-mail: jane.kennedy@arcadis-us.com

From: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
Sent: Wednesday, May 14, 2008 11:24 AM
To: Kennedy, Jane
Subject: 1150ml of sample.....
Importance: High

Jane - we can probably do 100ml-1ml for PCB but it would take 500ml to maintain the SVOC RL - can we double the SVOC RLs and use 250ml to 0.5ml? That would leave 800ml for explosives.....

Thanks,
Marcia McGinnity, TME
Senior Project Manager
Empirical Laboratories, LLC
227 French Landing Drive, Suite 550 I Nashville, TN 37228 I www.empirlabs.com
Main: 615.345.1115 ext. 232 I Toll free: 877.345.1113 I Cell: 615.207.9918 I Fax: 615.846.5426

Recipient of the 2008 Region IV (Southeastern US) Subcontractor of the Year from the Small Business Administration.
Celebrating over 40 years of excellence, Empirical Laboratories is certified as a HUBZone Business, a Woman-Owned Small Business, and a Small Disadvantaged Business by the Small Business Administration. Come visit our website at www.empirlabs.com today.

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Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

nalyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

xtract and hold all of the other "HOLD" samples.

im waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
ne

ne Kennedy
inciple Scientist
RCADIS US, Inc.
50 N. Causeway Blvd.
iite 1600
etairie, LA 70002
ione: (504) 832-4174 Ext 106
ell: (225) 205-8256
mail: jane.kennedy@arcadis-us.com

---

om: Sharpe, Christopher
nt: Friday, May 16, 2008 2:50 PM
: Kennedy, Jane
: Llewellyn, Tim; Quinnan, Joseph; Wisbeck, Diane; Powell, Jace'que
ibject: RE: using 12 samples

ust got off of the phone with Joe Q re these samples.
ts analyze the soil samples from 5DitchSB003 and 5DitchSB004 for VOCs only and discard the soil samples from
)itchSB001 and 5ditchSB002

m and Diane agree that the potential cost savings for extract and hold on the 12 samples referenced below makes
nse so let's do that as well.

S

---

om: Kennedy, Jane
nt: Friday, May 16, 2008 1:54 PM
: Sharpe, Christopher
ibject: using 12 samples

804.80 to extract and hold the 12 for SVOCs, PCBs, Explosives

)Cs are $1782 if we analyze the 12 remaining

ne Kennedy
inciple Scientist
RCADIS US, Inc.
50 N. Causeway Blvd.
iite 1600
etairie, LA 70002

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-05

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 020F2001

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/09/08 10:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/14/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/16/08 21:11

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.1	20		U
11104-28-2	PCB-1221	5.1	20		U
11141-16-5	PCB-1232	5.1	20		U
53469-21-9	PCB-1242	5.1	20		U
12672-29-6	PCB-1248	5.1	20		U
11097-69-1	PCB-1254	5.1	20		U
11096-82-5	PCB-1260	5.1	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-06

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 021F2101

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/09/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/14/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/16/08 21:31

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.2	21		U
11104-28-2	PCB-1221	5.2	21		U
11141-16-5	PCB-1232	5.2	21		U
53469-21-9	PCB-1242	5.2	21		U
12672-29-6	PCB-1248	5.2	21		U
11097-69-1	PCB-1254	5.2	21		U
11096-82-5	PCB-1260	5.2	21		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-07

Sample wt/vol: 15.7 (g/mL) G Lab File ID: 022F2201

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/14/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/16/08 21:52

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.1	20		U
11104-28-2	PCB-1221	5.1	20		U
11141-16-5	PCB-1232	5.1	20		U
53469-21-9	PCB-1242	5.1	20		U
12672-29-6	PCB-1248	5.1	20		U
11097-69-1	PCB-1254	5.1	20		U
11096-82-5	PCB-1260	5.1	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034DUP01 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-08

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 023F2301

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/14/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/16/08 22:12

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.3	21		U
11104-28-2	PCB-1221	5.3	21		U
11141-16-5	PCB-1232	5.3	21		U
53469-21-9	PCB-1242	5.3	21		U
12672-29-6	PCB-1248	5.3	21		U
11097-69-1	PCB-1254	5.3	21		U
11096-82-5	PCB-1260	5.3	21	8.9	JB

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-09

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 024F2401

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/09/08 13:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/14/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/16/08 22:33

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.3	21		U
11104-28-2	PCB-1221	5.3	21		U
11141-16-5	PCB-1232	5.3	21		U
53469-21-9	PCB-1242	5.3	21		U
12672-29-6	PCB-1248	5.3	21		U
11097-69-1	PCB-1254	5.3	21	48	(1)
11096-82-5	PCB-1260	5.3	21	50	B(1)

(1) = DUE TO THE PRESENCE OF MULTIPLE AROCLORS, THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLORS IN THE SAMPLE WERE IDENTIFIED AS THE AROCLORS THAT MOST CLOSELY MATCHED. THE AROCLORS MAY BE BIASED HIGH TO DUE TO THE PRESENCE OF MULTIPLE AROCLORS.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041HP004
(050908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-01

Sample wt/vol: 1040 (g/mL) ML Lab File ID: 046F4601

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 09:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/19/08 05:00

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.48		U
11104-28-2	PCB-1221	0.12	0.48		U
11141-16-5	PCB-1232	0.12	0.48		U
53469-21-9	PCB-1242	0.12	0.48		U
12672-29-6	PCB-1248	0.12	0.48		U
11097-69-1	PCB-1254	0.12	0.48		U
11096-82-5	PCB-1260	0.12	0.48		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP001
(05092008

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-02

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 022F2201

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 08:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/28/08 23:51

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.50		U
11104-28-2	PCB-1221	0.12	0.50		U
11141-16-5	PCB-1232	0.12	0.50		U
53469-21-9	PCB-1242	0.12	0.50		U
12672-29-6	PCB-1248	0.12	0.50		U
11097-69-1	PCB-1254	0.12	0.50		U
11096-82-5	PCB-1260	0.12	0.50	1.8	(1)

(1) = THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLOR IN THE SAMPLE WAS IDENTIFIED AS THE AROCLOR IT MOST CLOSELY MATCHED.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP003
(05092008

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-03

Sample wt/vol: 1040 (g/mL) ML Lab File ID: 048F4801

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 11:20

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/19/08 05:41

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.48		U
11104-28-2	PCB-1221	0.12	0.48		U
11141-16-5	PCB-1232	0.12	0.48		U
53469-21-9	PCB-1242	0.12	0.48		U
12672-29-6	PCB-1248	0.12	0.48		U
11097-69-1	PCB-1254	0.12	0.48		U
11096-82-5	PCB-1260	0.12	0.48		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549 HP00
8 (0510200

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-04

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 049F4901

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/10/08 09:15

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/19/08 06:01

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.50		U
11104-28-2	PCB-1221	0.12	0.50		U
11141-16-5	PCB-1232	0.12	0.50		U
53469-21-9	PCB-1242	0.12	0.50		U
12672-29-6	PCB-1248	0.12	0.50		U
11097-69-1	PCB-1254	0.12	0.50		U
11096-82-5	PCB-1260	0.12	0.50		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB001 (0 5102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-06

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 050F5001

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/10/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/19/08 06:22

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.50		U
11104-28-2	PCB-1221	0.12	0.50		U
11141-16-5	PCB-1232	0.12	0.50		U
53469-21-9	PCB-1242	0.12	0.50		U
12672-29-6	PCB-1248	0.12	0.50		U
11097-69-1	PCB-1254	0.12	0.50		U
11096-82-5	PCB-1260	0.12	0.50		U

FORM 2
SOIL PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Column(1): RTX-CLP ID: 0.32 (mm) Column(2): RTX-CLPII ID: 0.32 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PS1BLK0514	91	93	114	114			0
02	PS1BLK0514LC	112	106	122	124			0
03	PS1BLK0514LC	85	85	99	102			0
04	1041SB003 (0	96	99	121	119			0
05	1041SB001 (0	95	97	96	94			0
06	1034SB006 (0	100	104	94	92			0
07	1034DUP01 (0	108	109	119	139			0
08	1034SB007 (0	111	113	108	112			0
09								
10								
11								
12								
13								
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17								
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25								
26								
27								
28								
29								
30								

		EL QC LIMITS	SPIKE CONC (ug/Kg)
S1	= TCMX	(30-120)	17
S2	= DCB	(35-140)	17

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 2
WATER PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Column(1): RTX-CLP ID: 0.32 (mm) Column(2): RTX-CLPII ID: 0.32 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PW2BLK0514	91	92	77	85			0
02	PW2BLK0514LC	111	89	80	85			0
03	PW2BLK0514LC	95	95	86	93			0
04	1041HP004 (0	98	93	97	106			0
05	1041HP003 (0	255*	96	63	71			1
06	1549 HP008 (	518*	88	126	131*			2
07	EB001 (05102	105	99	60	67			0
08	1041HP001 (0	138*	94	93	107			1
09								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		EL QC LIMITS	SPIKE CONC (ug/L)
S1	= TCMX	(25-120)	0.50
S2	= DCB	(25-130)	0.50

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: PS1BLK0514

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PCB-1016	166.7	0.0000	179.0	107	45-120
PCB-1260	166.7	21.92	173.0	91	40-125

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	166.7	141.1	85	24	50	45-120
PCB-1260	166.7	153.1	79	12	50	40-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 3
WATER PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: PW2BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
PCB-1016	5.000	0.0000	4.949	99	30-140
PCB-1260	5.000	0.0000	4.085	82	40-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	5.000	5.418	108	9	30	30-140
PCB-1260	5.000	4.639	93	13	30	40-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PS1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Lab Sample ID: PS1BLK0514 Lab File ID: 017F1701

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SOXH

Sulfur Cleanup (Y/N) Y Date Extracted: 05/14/08

Date Analyzed (1): 05/16/08 Date Analyzed (2): 05/16/08

Time Analyzed (1): 2009 Time Analyzed (2): 2009

Instrument ID (1): ECD4 Instrument ID (2): ECD4

Column (1): RTX-CLP ID: 0.32(mm) Column (2): RTX-CLPII ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PS1BLK0514LC	PS1BLK0514LCS	05/16/08	05/16/08
02	PS1BLK0514LC	PS1BLK0514LCSD	05/16/08	05/16/08
03	1041SB003 (0	0805104-05	05/16/08	05/16/08
04	1041SB001 (0	0805104-06	05/16/08	05/16/08
05	1034SB006 (0	0805104-07	05/16/08	05/16/08
06	1034DUP01 (0	0805104-08	05/16/08	05/16/08
07	1034SB007 (0	0805104-09	05/16/08	05/16/08
08				
09				
10				
11				
12				
13				
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15				
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17				
18				
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21				
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23				
24				
25				
26				

COMMENTS: _____

FORM IV PCB

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PS1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: PS1BLK0514

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 017F1701

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/14/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 05/16/08 20:09

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.2	17		U
11104-28-2	PCB-1221	4.2	17		U
11141-16-5	PCB-1232	4.2	17		U
53469-21-9	PCB-1242	4.2	17		U
12672-29-6	PCB-1248	4.2	17		U
11097-69-1	PCB-1254	4.2	17		U
11096-82-5	PCB-1260	4.2	17	22	

FORM 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PW2BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Lab Sample ID: PW2BLK0514 Lab File ID: 042F4201

Matrix (soil/water) WATER Extraction: (SepF/Cont/Sonc/Soxh) SEPF

Sulfur Cleanup (Y/N) Y Date Extracted: 05/14/08

Date Analyzed (1): 05/19/08 Date Analyzed (2): 05/19/08

Time Analyzed (1): 0337 Time Analyzed (2): 0337

Instrument ID (1): ECD4 Instrument ID (2): ECD4

Column (1): RTX-CLP ID: 0.32(mm) Column (2): RTX-CLPII ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PW2BLK0514LC	PW2BLK0514LCS	05/19/08	05/19/08
02	PW2BLK0514LC	PW2BLK0514LCSD	05/19/08	05/19/08
03	1041HP004 (0	0805104-01	05/19/08	05/19/08
04	1041HP003 (0	0805104-03	05/19/08	05/19/08
05	1549 HP008 (	0805115-04	05/19/08	05/19/08
06	EB001 (05102	0805115-06	05/19/08	05/19/08
07	1041HP001 (0	0805104-02	05/28/08	05/28/08
08				
09				
10				
11				
12				
13				
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24				
25				
26				

COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW2BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: PW2BLK0514

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 042F4201

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 05/19/08 03:37

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.50		U
11104-28-2	PCB-1221	0.12	0.50		U
11141-16-5	PCB-1232	0.12	0.50		U
53469-21-9	PCB-1242	0.12	0.50		U
12672-29-6	PCB-1248	0.12	0.50		U
11097-69-1	PCB-1254	0.12	0.50		U
11096-82-5	PCB-1260	0.12	0.50		U

EXPLOSIVES SECTION

ORGANIC CASE NARRATIVE - Explosives
Arcadis – Radford002

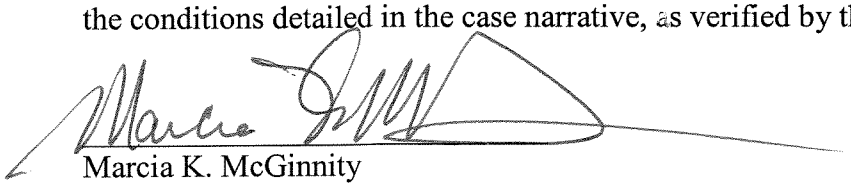
Date Sampled	Date Received	Lab ID	Client ID	TAT/SDG
05/09/08	05/10/08	0805104-01	1041HP004 (050908)	X
05/09/08	05/10/08	0805104-02	1041HP001 (050908)	X
05/09/08	05/10/08	0805104-03	1041HP003 (050908)	X
05/09/08	05/10/08	0805104-05	1041SB003 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-06	1041SB001 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-07	1034SB006 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-08	1034DUP01 (0.5-1.5)	4BD
05/09/08	05/10/08	0805104-09	1034SB007 (0.5-1.5)	4BD
05/09/08	05/10/08	0805105-01	1041SB003 (7-8)	Radford003
05/09/08	05/10/08	0805105-02	1041SB001 (7-8)	Radford003
05/09/08	05/10/08	0805105-03	1034SB006 (7-8)	Radford003
05/09/08	05/10/08	0805105-04	1034SB007 (7-8)	Radford003
05/10/08	05/13/08	0805115-04	1549 HP008 (05102008)	X* full volume
05/10/08	05/13/08	0805115-06	EB001 (05102008)	X

Method: The samples were extracted/analyzed for client specified analyte lists by USEPA SW-846 Method 8330A (solid phase or shaker extraction followed by packed column HPLC) for waters or soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction was requested 5/19/08 for samples reflected as SDG Radford003 but analysis is still pending request from the client. E-mail instructions are attached.
- Note2: Limited sample volume was received for sample 1549 HP008 (05102008). After centrifuging to determine actual amount of sample received, client instructed that the explosives be extracted full volume. E-mail instructions are attached.
- Calibration Criteria: All target analytes required for the analyses were within 15% difference or the continuing calibration verification met an average of 15% difference with no individual target exceeding 30% difference.
- Method Blank Results: No target analytes were detected in the associated method blanks.
- Surrogate Recoveries: All recoveries were within limits.
- LCS(/LCSD) results: All recoveries (and relative percent differences) were within limits.
- MS/MSD results: Not applicable.
- Dilutions: All samples were analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.



Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, May 14, 2008 1:41 PM
To: MMcGinnity@EmpirLabs.com
Cc: Powell, Jace'que; Borne, Rachelle
Subject: RE: 1150ml of sample.....1549HP008(05102008)

Marcia

op the SVOC analysis request for these samples and perform the Explosives and the PCBs. This should give you the ll 1 liter for the explosives

anks
ne

ne Kennedy
inciple Scientist
RCADIS US, Inc.
50 N. Causeway Blvd.
iite 1600
etairie, LA 70002
ione: (504) 832-4174 Ext 106
ell: (225) 205-8256
mail: jane.kennedy@arcadis-us.com

om: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
nt: Wednesday, May 14, 2008 1:08 PM
: Kennedy, Jane
ibject: RE: 1150ml of sample.....

otcha - they are holding extraction batches for these....if there's anything you can do to get them to ecide! ;)

anks,
arcia

From: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
Sent: Wednesday, May 14, 2008 12:34 PM
To: Kennedy, Jane
Subject: RE: 1150ml of sample.....

1549HP008(05102008)

Thanks,
Marcia

-----Original Message-----
From: Kennedy, Jane [mailto:Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, May 14, 2008 12:13 PM
To: MMcGinnity@EmpirLabs.com

Subject: RE: 1150ml of sample.....

Can you send me the sample ID again? I don't think the first part of the ID is correct

Jane Kennedy

Principle Scientist
ARCADIS US, Inc.
3850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002

Phone: (504) 832-4174 Ext 106
Cell: (225) 205-8256
e-mail: jane.kennedy@arcadis-us.com

From: Marcia McGinnity [mailto:MMcGinnity@EmpirLabs.com]
Sent: Wednesday, May 14, 2008 11:24 AM
To: Kennedy, Jane
Subject: 1150ml of sample.....
Importance: High

Jane - we can probably do 100ml-1ml for PCB but it would take 500ml to maintain the SVOC RL - can we double the SVOC RLs and use 250ml to 0.5ml? That would leave 800ml for explosives.....

Thanks,
Marcia McGinnity, TME
Senior Project Manager
Empirical Laboratories, LLC
227 French Landing Drive, Suite 550 I Nashville, TN 37228 I www.empirlabs.com
Main: 615.345.1115 ext. 232 I Toll free: 877.345.1113 I Cell: 615.207.9918 I Fax: 615.846.5426

Recipient of the 2008 Region IV (Southeastern US) Subcontractor of the Year from the Small Business Administration.
Celebrating over 40 years of excellence, Empirical Laboratories is certified as a HUBZone Business, a Woman-Owned Small Business, and a Small Disadvantaged Business by the Small Business Administration. Come visit our website at www.empirlabs.com today.

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Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Friday, May 16, 2008 2:57 PM
To: MMcGinnity@EmpirLabs.com
Subject: Hold Samples

alyze VOCs for 5DitchSB003 and 5DitchSB004 and discard the other 2 ditch samples.

tract and hold all of the other "HOLD" samples.

m waiting to find out for sure about analyzing the VOCs on the "HOLD" samples
e

ne Kennedy
inciple Scientist
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50 N. Causeway Blvd.
ite 1600
tairie, LA 70002
one: (504) 832-4174 Ext 106
ll: (225) 205-8256
nail: jane.kennedy@arcadis-us.com

---

om: Sharpe, Christopher
nt: Friday, May 16, 2008 2:50 PM
: Kennedy, Jane
: Llewellyn, Tim; Quinnan, Joseph; Wisbeck, Diane; Powell, Jace'que
bject: RE: using 12 samples

st got off of the phone with Joe Q re these samples.
ts analyze the soil samples from 5DitchSB003 and 5DitchSB004 for VOCs only and discard the soil samples from
itchSB001 and 5ditchSB002

n and Diane agree that the potential cost savings for extract and hold on the 12 samples referenced below makes
nse so let's do that as well.

S

---

om: Kennedy, Jane
nt: Friday, May 16, 2008 1:54 PM
: Sharpe, Christopher
bject: using 12 samples

804.80 to extract and hold the 12 for SVOCs, PCBs, Explosives

Cs are $1782 if we analyze the 12 remaining

ne Kennedy
nciple Scientist
RCADIS US, Inc.
50 N. Causeway Blvd.
ite 1600
tairie, LA 70002

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP004 (050908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-01

Sample wt/vol: 1000 (g/ml) ML Lab File ID: 003V0301

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 09:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/15/08 16:19

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.080	0.20		U
121-82-4	RDX	0.080	0.20		U
98-95-3	Nitrobenzene	0.088	0.20		U
99-65-0	1,3-Dinitrobenzene	0.080	0.20		U
99-35-4	1,3,5-Trinitrobenzene	0.080	0.20		U
121-14-2	2,4-Dinitrotoluene	0.10	0.20		U
606-20-2	2,6-Dinitrotoluene	0.10	0.20		U
118-96-7	2,4,6-Trinitrotoluene	0.080	0.20		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	0.20		U
479-45-8	Tetryl	0.080	0.20		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.080	0.20		U
88-72-2	2-Nitrotoluene	0.080	0.20		U
99-99-0	4-Nitrotoluene	0.080	0.20		U
99-08-1	3-Nitrotoluene	0.12	0.20		U
55-63-0	Nitroglycerin	1.3	4.0		U
78-11-5	PETN	1.3	4.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041HP001
(05092008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-02

Sample wt/vol: 900.0 (g/ml) ML Lab File ID: 004V0401

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 08:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/15/08 16:49

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.089	0.22		U
121-82-4	RDX	0.089	0.22		U
98-95-3	Nitrobenzene	0.098	0.22		U
99-65-0	1,3-Dinitrobenzene	0.089	0.22		U
99-35-4	1,3,5-Trinitrobenzene	0.089	0.22		U
121-14-2	2,4-Dinitrotoluene	0.12	0.22		U
606-20-2	2,6-Dinitrotoluene	0.12	0.22		U
118-96-7	2,4,6-Trinitrotoluene	0.089	0.22		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	0.22		U
479-45-8	Tetryl	0.089	0.22		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.089	0.22		U
88-72-2	2-Nitrotoluene	0.089	0.22		U
99-99-0	4-Nitrotoluene	0.089	0.22		U
99-08-1	3-Nitrotoluene	0.13	0.22		U
55-63-0	Nitroglycerin	1.4	4.4		U
78-11-5	PETN	1.4	4.4		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041HP003
(05092008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805104-03

Sample wt/vol: 950.0 (g/ml) ML Lab File ID: 005V0501

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/09/08 11:20

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/15/08 17:19

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.084	0.21		U
121-82-4	RDX	0.084	0.21		U
98-95-3	Nitrobenzene	0.093	0.21		U
99-65-0	1,3-Dinitrobenzene	0.084	0.21		U
99-35-4	1,3,5-Trinitrobenzene	0.084	0.21		U
121-14-2	2,4-Dinitrotoluene	0.11	0.21		U
606-20-2	2,6-Dinitrotoluene	0.11	0.21		U
118-96-7	2,4,6-Trinitrotoluene	0.084	0.21		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.13	0.21		U
479-45-8	Tetryl	0.084	0.21		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.084	0.21		U
88-72-2	2-Nitrotoluene	0.084	0.21		U
99-99-0	4-Nitrotoluene	0.084	0.21		U
99-08-1	3-Nitrotoluene	0.13	0.21		U
55-63-0	Nitroglycerin	1.3	4.2		U
78-11-5	PETN	1.3	4.2		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-05

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 012V1201

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 10:20

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/14/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/15/08 20:47

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-06

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 015V1501

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/14/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/15/08 22:16

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-07

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 016V1601

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/14/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/15/08 22:46

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034DUP01 (0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-08

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 017V1701

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 12:50

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/14/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/15/08 23:16

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007
(0.5-1.5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: 0805104-09

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 018V1801

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 13:30

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/14/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/15/08 23:47

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549 HP00
8 (0510200

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-04

Sample wt/vol: 1000 (g/ml) ML Lab File ID: 006V0601

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/10/08 09:15

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/15/08 17:50

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.080	0.20		U
121-82-4	RDX	0.080	0.20		U
98-95-3	Nitrobenzene	0.088	0.20		U
99-65-0	1,3-Dinitrobenzene	0.080	0.20		U
99-35-4	1,3,5-Trinitrobenzene	0.080	0.20		U
121-14-2	2,4-Dinitrotoluene	0.10	0.20		U
606-20-2	2,6-Dinitrotoluene	0.10	0.20		U
118-96-7	2,4,6-Trinitrotoluene	0.080	0.20		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	0.20		U
479-45-8	Tetryl	0.080	0.20		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.080	0.20		U
88-72-2	2-Nitrotoluene	0.080	0.20		U
99-99-0	4-Nitrotoluene	0.080	0.20		U
99-08-1	3-Nitrotoluene	0.12	0.20		U
55-63-0	Nitroglycerin	1.3	4.0		U
78-11-5	PETN	1.3	4.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB001 (0 5102008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: 0805115-06

Sample wt/vol: 1000 (g/ml) ML Lab File ID: 007V0701

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 05/10/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/15/08 18:20

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.080	0.20		U
121-82-4	RDX	0.080	0.20		U
98-95-3	Nitrobenzene	0.088	0.20		U
99-65-0	1,3-Dinitrobenzene	0.080	0.20		U
99-35-4	1,3,5-Trinitrobenzene	0.080	0.20		U
121-14-2	2,4-Dinitrotoluene	0.10	0.20		U
606-20-2	2,6-Dinitrotoluene	0.10	0.20		U
118-96-7	2,4,6-Trinitrotoluene	0.080	0.20		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	0.20		U
479-45-8	Tetryl	0.080	0.20		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.080	0.20		U
88-72-2	2-Nitrotoluene	0.080	0.20		U
99-99-0	4-Nitrotoluene	0.080	0.20		U
99-08-1	3-Nitrotoluene	0.12	0.20		U
55-63-0	Nitroglycerin	1.3	4.0		U
78-11-5	PETN	1.3	4.0		U

FORM 2
SOIL EXPL SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	S3 1 %REC #	S3 2 %REC #	TOT OUT
01	ES1BLK0514	103						0
02	ES1BLK0514LC	101						0
03	ES1BLK0514LC	101						0
04	ES1BLK0514LC	103						0
05	1041SB003 (0	105						0
06	1041SB001 (0	113						0
07	1034SB006 (0	114	117					0
08	1034DUP01 (0	119	118					0
09	1034SB007 (0	105						0
10	1034SB006 (0		110					0
08	1034DUP01 (0		125					0
09	1034SB007 (0		109					0
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27								
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29								
30								

		EL QC LIMITS	SPIKE CONC (mg/Kg)
S1	= 1,2-Dinitrobenzene	(55-140)	1.0

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 2
WATER EXPL SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	S3 1 %REC #	S3 2 %REC #	TOT OUT
01	EW1BLK0514	88	97					0
02	EW1BLK0514LC	89						0
03	EW1BLK0514LC	94						0
04	1041HP004 (0	90	101					0
05	1041HP001 (0	88	~~100~~		6/3/05			0
06	1041HP003 (0	95	~~106~~					0
07	1549 HP008 (	105	103					0
08	EB001 (05102	106	101					0
09	1549 HP008 (		97					0
02	EB001 (05102		86					0
11								
12								
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30								

		EL QC LIMITS	SPIKE CONC (ug/L)
S1	= 1,2-Dinitrobenzene	(40-145)	2.0

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: ES1BLK0514

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	5.000	0.0000	5.027	100	75-140
RDX	5.000	0.0000	5.228	104	80-120
Nitrobenzene	5.000	0.0000	5.293	106	20-145
1,3-Dinitrobenzene	5.000	0.0000	5.343	107	85-130
1,3,5-Trinitrobenzene	5.000	0.0000	5.221	104	70-120
2,4-Dinitrotoluene	5.000	0.0000	4.869	97	75-130
2,6-Dinitrotoluene	5.000	0.0000	5.126	102	65-130
2,4,6-Trinitrotoluene	5.000	0.0000	4.787	96	45-140
2-Amino-4,6-dinitrotolu	5.000	0.0000	5.187	104	60-125
Tetryl	5.000	0.0000	4.780	96	55-150
4-Amino-2,6-dinitrotolu	5.000	0.0000	4.759	95	30-175
2-Nitrotoluene	5.000	0.0000	5.265	105	65-130
4-Nitrotoluene	5.000	0.0000	5.331	107	65-130
3-Nitrotoluene	5.000	0.0000	5.249	105	65-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: ES1BLK0514

COMPOUND	SPIKE ADDED (mg/Kg)	LCSD CONCENTRATION (mg/Kg)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	5.000	4.988	100	1	50	75-140
RDX	5.000	5.204	104	0	50	80-120
Nitrobenzene	5.000	5.222	104	1	50	20-145
1,3-Dinitrobenzene	5.000	5.301	106	1	50	85-130
1,3,5-Trinitrobenzene	5.000	5.226	104	0	50	70-120
2,4-Dinitrotoluene	5.000	4.876	98	0	50	75-130
2,6-Dinitrotoluene	5.000	5.050	101	1	50	65-130
2,4,6-Trinitrotoluene	5.000	4.796	96	0	50	45-140
2-Amino-4,6-dinitrotolu	5.000	5.160	103	0	50	60-125
Tetryl	5.000	4.773	95	0	50	55-150
4-Amino-2,6-dinitrotolu	5.000	4.833	97	2	50	30-175
2-Nitrotoluene	5.000	5.210	104	1	50	65-130
4-Nitrotoluene	5.000	5.259	105	1	50	65-130
3-Nitrotoluene	5.000	5.203	104	1	50	65-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 0 out of 28 outside limits

COMMENTS: _____

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: ES1BLK0514LCSN

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC #	QC. LIMITS REC.
Nitroglycerin	50.00	0.0000	51.31	103	60-120
PETN	50.00	0.0000	50.48	101	60-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 2 outside limits

COMMENTS: _____

FORM 3
WATER EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: EW1BLK0514

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
HMX	10.00	0.0000	9.370	94	55-140
RDX	10.00	0.0000	9.680	97	60-145
Nitrobenzene	10.00	0.0000	9.569	96	35-130
1,3-Dinitrobenzene	10.00	0.0000	9.501	95	65-145
1,3,5-Trinitrobenzene	10.00	0.0000	9.776	98	55-125
2,4-Dinitrotoluene	10.00	0.0000	8.880	89	60-140
2,6-Dinitrotoluene	10.00	0.0000	9.169	92	60-130
2,4,6-Trinitrotoluene	10.00	0.0000	8.788	88	60-130
2-Amino-4,6-dinitrotolu	10.00	0.0000	9.137	91	60-135
Tetryl	10.00	0.0000	9.321	93	10-170
4-Amino-2,6-dinitrotolu	10.00	0.0000	8.548	85	55-140
2-Nitrotoluene	10.00	0.0000	8.649	86	35-135
4-Nitrotoluene	10.00	0.0000	8.923	89	55-130
3-Nitrotoluene	10.00	0.0000	8.814	88	45-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 14 outside limits

COMMENTS: _____

FORM 3
WATER EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix Spike - Client Sample No.: EW1BLK0514LCSN

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Nitroglycerin	100.0	0.0000	93.25	93	60-120
PETN	100.0	0.0000	87.01	87	60-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 2 outside limits

COMMENTS: _____

FORM 4
EXPL METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

ES1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Lab Sample ID: ES1BLK0514 Lab File ID: 008V0801

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SONC

Sulfur Cleanup (Y/N) N Date Extracted: 05/14/08

Date Analyzed (1): 05/15/08 Date Analyzed (2):

Time Analyzed (1): 1850 Time Analyzed (2):

Instrument ID (1): HPLC2 Instrument ID (2): HPLC1

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	ES1BLK0514LC	ES1BLK0514LCS	05/15/08	
02	ES1BLK0514LC	ES1BLK0514LCSD	05/15/08	
03	ES1BLK0514LC	ES1BLK0514LCSN	05/15/08	
04	1041SB003 (0	0805104-05	05/15/08	
05	1041SB001 (0	0805104-06	05/15/08	
06	1034SB006 (0	0805104-07	05/15/08	05/15/08
07	1034DUP01 (0	0805104-08	05/15/08	05/15/08
08	1034SB007 (0	0805104-09	05/15/08	
09	1034SB006 (0	0805104-07		05/16/08
10	1034DUP01 (0	0805104-08		05/16/08
11	1034SB007 (0	0805104-09		05/16/08
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26				

COMMENTS: _____

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ES1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) SOIL Lab Sample ID: ES1BLK0514

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 008V0801

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/14/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 05/15/08 18:50

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 4
EXPL METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

EW1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Lab Sample ID: EW1BLK0514 Lab File ID: 049V4901

Matrix (soil/water) WATER Extraction: (SepF/Cont/Sonc/Soxh) SEPF

Sulfur Cleanup (Y/N) N Date Extracted: 05/14/08

Date Analyzed (1): 05/14/08 Date Analyzed (2): 05/15/08

Time Analyzed (1): 1546 Time Analyzed (2): 2305

Instrument ID (1): HPLC2 Instrument ID (2): HPLC1

Column (1): ULTRA C-18 ID: 4.60(mm) Column (2): SYNERGI POLAR-RP ID: 4.60(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	EW1BLK0514LC	EW1BLK0514LCS	05/14/08	
02	EW1BLK0514LC	EW1BLK0514LCSN	05/14/08	
03	1041HP004 (0	0805104-01	05/15/08	05/15/08
04	1041HP001 (0	0805104-02	05/15/08	05/16/08
05	1041HP003 (0	0805104-03	05/15/08	~~05/16/08~~
06	1549 HP008 (	0805115-04	05/15/08	05/16/08
07	EB001 (05102	0805115-06	05/15/08	05/16/08
08	1549 HP008 (	0805115-04		05/30/08
07	EB001 (05102	0805115-06		05/30/08
10				
11				
12				
13				
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6/3/08

COMMENTS:

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EW1BLK0514

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD002

Matrix: (soil/water) WATER Lab Sample ID: EW1BLK0514

Sample wt/vol: 1000 (g/ml) ML Lab File ID: 049V4901

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:05/14/08

Concentrated Extract Volume: 8.0(ml) Date Analyzed: 05/14/08 15:46

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.080	0.20		U
121-82-4	RDX	0.080	0.20		U
98-95-3	Nitrobenzene	0.088	0.20		U
99-65-0	1,3-Dinitrobenzene	0.080	0.20		U
99-35-4	1,3,5-Trinitrobenzene	0.080	0.20		U
121-14-2	2,4-Dinitrotoluene	0.10	0.20		U
606-20-2	2,6-Dinitrotoluene	0.10	0.20		U
118-96-7	2,4,6-Trinitrotoluene	0.080	0.20		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.12	0.20		U
479-45-8	Tetryl	0.080	0.20		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.080	0.20		U
88-72-2	2-Nitrotoluene	0.080	0.20		U
99-99-0	4-Nitrotoluene	0.080	0.20		U
99-08-1	3-Nitrotoluene	0.12	0.20		U
55-63-0	Nitroglycerin	1.3	4.0		U
78-11-5	PETN	1.3	4.0		U

INORGANIC SECTION

INORGANIC CASE NARRATIVE
Arcadis
SDG# Radford002
Work Order# 0805104, 0805115
May, 2008

Empirical Laboratories ID	Client ID
0805104-01	1041HP004 (050908)
0805104-02	1041HP001 (05092008)
0805104-03	1041HP003 (05092008)
0805104-05	1041SB003 (0.5-1.5)
0805104-06	1041SB001 (0.5-1.5)
0805104-07	1034SB006 (0.5-1.5)
0805104-08	1034DUP01 (0.5-1.5)
0805104-09	1034SB007 (0.5-1.5)
0805115-04	1549 HP008 (05102008)
0805115-06	EB001 (05102008)

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Betty DeVille
Inorganic Lab Manager

Methods:

The samples were digested for ICAP metals using USEPA SW846 method 3005A for the water samples and 3050B for the soil samples and analyzed by 6010B. Mercury was digested and analyzed by 7470A for the water samples and 7471A for the soil samples. Note: The "U" flag on the forms indicates that the analyte is reported down to the MDL. The "B" flag indicates that the analyte result is between the CRDL and the laboratory MDL.

Specific Comments:

All analyses performed by the Inorganic section were completed meeting satisfactorily the corresponding specifications for Quality Control with the following exceptions:

I. ICAP Metals

A. Preparation Blank (PBW)
Specification Limits (<1/2 ±RL)

1. The preparation blank for the water samples was out of the specification limits for manganese at 49.983 ug/L. The sample concentration was greater than ten times the concentration of the blank and the equipment blank was less than the MDL. There is no impact to

the sample data.

B. Matrix Spike and Matrix Spike Duplicate (MS/MSD) Specification Limits (75 to 125%)

1. The matrix spike and/or the matrix spike duplicate were out of the specification limits for antimony at 15.6 and 12.5% and for calcium at -70.5% on sample 1034SB007 (0.5-1.5). The post digestion spike recovery was at 100.4% for antimony and at 102.4% for calcium. **All associated data is flagged with an "N" on the final report.**

C. Relative Percent Difference (RPD) Specification Limits (20%)

1. The relative percent difference between the matrix spike and the matrix spike duplicate was out of the specification limits for antimony at 23.6% for sample 1034SB007 (0.5-1.5). **All associated data are flagged with an (*) on the final report.**

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0805104-01	1041HP004 (050908)	Ground Water	05/09/08 9:00:00 AM	Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805104-02	1041HP001 (05092008)	Ground Water	05/09/08 8:30:00 AM	Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805104-02	1041HP001 (05092008)	Ground Water	05/09/08 8:30:00 AM	Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805104-03	1041HP003 (05092008)	Ground Water	05/09/08 11:20:00 AM	Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805104-05	1041SB003 (0.5-1.5)	Solid	05/09/08 10:20:00 AM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium

Lab Sample ID	Field ID	Matrix	Date _Time Sampled	Parameters requested
0805104-05	1041SB003 (0.5-1.5)	Solid	05/09/08 10:20:00 AM	Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805104-06	1041SB001 (0.5-1.5)	Solid	05/09/08 12:15:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805104-06	1041SB001 (0.5-1.5)	Solid	05/09/08 12:15:00 PM	Vanadium
				Zinc
0805104-07	1034SB006 (0.5-1.5)	Solid	05/09/08 12:50:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805104-08	1034DUP01 (0.5-1.5)	Solid	05/09/08 12:50:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805104-08	1034DUP01 (0.5-1.5)	Solid	05/09/08 12:50:00 PM	Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805104-09	1034SB007 (0.5-1.5)	Solid	05/09/08 1:30:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805104-10	SSB-026 (19-20)	Solid	05/09/08 2:50:00 PM	% Solids
0805104-11	SSB-025 (19-20)	Solid	05/09/08 3:30:00 PM	% Solids
0805104-12	SSB-021 (23-24)	Solid	05/09/08 4:30:00 PM	% Solids

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0805115-04	1549 HP008 (05102008)	Ground Water	05/10/08 9:15:00 AM	Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805115-06	EB001 (05102008)	Ground Water	05/10/08 12:00:00 PM	Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805115-06	EB001 (05102008)	Ground Water	05/10/08 12:00:00 PM	Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

SOW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
1041HP004 (050908)	0805104-01
1041HP001 (05092008)	0805104-02
1041HP003 (05092008)	0805104-03
1041SB003 (0.5-1.5)	0805104-05
1041SB001 (0.5-1.5)	0805104-06
1034SB006 (0.5-1.5)	0805104-07
1034DUP01 (0.5-1.5)	0805104-08
1034SB007 (0.5-1.5)	0805104-09
1034SB007 (0.5-1.5)S	0805104-09S
1034SB007 (0.5-1.5)SD	0805104-09SD
1549 HP008 (05102008)	0805115-04
EB001 (05102008)	0805115-06

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: D. Rick Davis

Date: _____ Title: Vice-President

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP004 (050908)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): GROUND WATER Lab Sample ID: 0805104-01

Level (low/med): LOW Date Received: 05/10/08

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12000			P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	5.8	B		P
7440-39-3	Barium	80.3			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	27000			P
7440-47-3	Chromium	38.4			P
7440-48-4	Cobalt	5.3	B		P
7440-50-8	Copper	5.0	U		P
7439-89-6	Iron	25000			P
7439-92-1	Lead	5.4			P
7439-95-4	Magnesium	23800			P
7439-96-5	Manganese	301			P
7439-97-6	Mercury	0.23			AV
7440-02-0	Nickel	30.6			P
7440-09-7	Potassium	4280	B		P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	13000			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	27.2	B		P
7440-66-6	Zinc	26.4			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP001 (05092008)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): GROUND WATER Lab Sample ID: 0805104-02

Level (low/med): LOW Date Received: 05/10/08

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	53800			P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	16.8			P
7440-39-3	Barium	618			P
7440-41-7	Beryllium	4.9	B		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	23500			P
7440-47-3	Chromium	139			P
7440-48-4	Cobalt	55.0			P
7440-50-8	Copper	95.2			P
7439-89-6	Iron	170000			P
7439-92-1	Lead	14.3			P
7439-95-4	Magnesium	37100			P
7439-96-5	Manganese	4490			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	171			P
7440-09-7	Potassium	16100			P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	15400			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	109			P
7440-66-6	Zinc	226			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP003 (05092008)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): GROUND WATER Lab Sample ID: 0805104-03

Level (low/med): LOW Date Received: 05/10/08

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	32000			P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	27.6			P
7440-39-3	Barium	226			P
7440-41-7	Beryllium	4.4	B		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	18800			P
7440-47-3	Chromium	144			P
7440-48-4	Cobalt	129			P
7440-50-8	Copper	222			P
7439-89-6	Iron	205000			P
7439-92-1	Lead	43.0			P
7439-95-4	Magnesium	18600			P
7439-96-5	Manganese	3740			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	205			P
7440-09-7	Potassium	16200			P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	13300			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	246			P
7440-66-6	Zinc	210			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041SB003 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Lab Sample ID: 0805104-05

Level (low/med): LOW Date Received: 05/10/08

% Solids: 80.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13200			P
7440-36-0	Antimony	1.2	U	N*	P
7440-38-2	Arsenic	1.3	B		P
7440-39-3	Barium	32.3			P
7440-41-7	Beryllium	0.41	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	16600		N	P
7440-47-3	Chromium	15.5			P
7440-48-4	Cobalt	6.5			P
7440-50-8	Copper	5.0	B		P
7439-89-6	Iron	14000			P
7439-92-1	Lead	6.2			P
7439-95-4	Magnesium	9670			P
7439-96-5	Manganese	449			P
7439-97-6	Mercury	0.035	B		AV
7440-02-0	Nickel	5.8			P
7440-09-7	Potassium	538	B		P
7782-49-2	Selenium	0.74	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	248	U		P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	17.5			P
7440-66-6	Zinc	15.1			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041SB001 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Lab Sample ID: 0805104-06

Level (low/med): LOW Date Received: 05/10/08

% Solids: 79.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	26300			P
7440-36-0	Antimony	1.2	U	N*	P
7440-38-2	Arsenic	4.2			P
7440-39-3	Barium	137			P
7440-41-7	Beryllium	1.3			P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	7110		N	P
7440-47-3	Chromium	30.4			P
7440-48-4	Cobalt	37.3			P
7440-50-8	Copper	14.6			P
7439-89-6	Iron	35700			P
7439-92-1	Lead	19.1			P
7439-95-4	Magnesium	4830			P
7439-96-5	Manganese	3300			P
7439-97-6	Mercury	0.077			AV
7440-02-0	Nickel	17.4			P
7440-09-7	Potassium	1360			P
7782-49-2	Selenium	0.74	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	246	U		P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	54.2			P
7440-66-6	Zinc	40.9			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB006 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Lab Sample ID: 0805104-07

Level (low/med): LOW Date Received: 05/10/08

% Solids: 78.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	44300			P
7440-36-0	Antimony	1.3	U	N*	P
7440-38-2	Arsenic	4.1			P
7440-39-3	Barium	43.9			P
7440-41-7	Beryllium	0.62	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	541	B	N	P
7440-47-3	Chromium	37.5			P
7440-48-4	Cobalt	3.9			P
7440-50-8	Copper	11.7			P
7439-89-6	Iron	50200			P
7439-92-1	Lead	15.2			P
7439-95-4	Magnesium	1040	B		P
7439-96-5	Manganese	59.4			P
7439-97-6	Mercury	0.25			AV
7440-02-0	Nickel	11.1			P
7440-09-7	Potassium	922	B		P
7782-49-2	Selenium	0.75	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	251	U		P
7440-28-0	Thallium	0.75	U		P
7440-62-2	Vanadium	81.7			P
7440-66-6	Zinc	25.0			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034DUP01 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Lab Sample ID: 0805104-08

Level (low/med): LOW Date Received: 05/10/08

% Solids: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	32200			P
7440-36-0	Antimony	1.3	U	N*	P
7440-38-2	Arsenic	4.9			P
7440-39-3	Barium	66.1			P
7440-41-7	Beryllium	0.74	B		P
7440-43-9	Cadmium	0.32	B		P
7440-70-2	Calcium	1360		N	P
7440-47-3	Chromium	39.6			P
7440-48-4	Cobalt	6.2			P
7440-50-8	Copper	39.9			P
7439-89-6	Iron	42700			P
7439-92-1	Lead	21.7			P
7439-95-4	Magnesium	1290	B		P
7439-96-5	Manganese	276			P
7439-97-6	Mercury	0.14			AV
7440-02-0	Nickel	10.0			P
7440-09-7	Potassium	955	B		P
7782-49-2	Selenium	0.77	U		P
7440-22-4	Silver	0.26	U		P
7440-23-5	Sodium	257	U		P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	77.4			P
7440-66-6	Zinc	82.7			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB007 (0.5-1.5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Lab Sample ID: 0805104-09

Level (low/med): LOW Date Received: 05/10/08

% Solids: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29000			P
7440-36-0	Antimony	1.2	U	N*	P
7440-38-2	Arsenic	1.6	B		P
7440-39-3	Barium	73.3			P
7440-41-7	Beryllium	1.1	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	2070		N	P
7440-47-3	Chromium	59.1			P
7440-48-4	Cobalt	11.0			P
7440-50-8	Copper	27.6			P
7439-89-6	Iron	90500			P
7439-92-1	Lead	29.2			P
7439-95-4	Magnesium	1410			P
7439-96-5	Manganese	1130			P
7439-97-6	Mercury	0.13			AV
7440-02-0	Nickel	11.7			P
7440-09-7	Potassium	1010	B		P
7782-49-2	Selenium	0.74	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	247	U		P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	89.1			P
7440-66-6	Zinc	53.9			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549 HP008 (05102008)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): GROUND WATER Lab Sample ID: 0805115-04

Level (low/med): LOW Date Received: 05/13/08

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	179000			P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	35.0			P
7440-39-3	Barium	507			P
7440-41-7	Beryllium	6.6			P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	34300			P
7440-47-3	Chromium	150			P
7440-48-4	Cobalt	213			P
7440-50-8	Copper	113			P
7439-89-6	Iron	197000			P
7439-92-1	Lead	90.5			P
7439-95-4	Magnesium	26800			P
7439-96-5	Manganese	7660			P
7439-97-6	Mercury	0.36			AV
7440-02-0	Nickel	87.5			P
7440-09-7	Potassium	11000			P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	11900			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	353			P
7440-66-6	Zinc	387			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EB001 (05102008)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): GROUND WATER Lab Sample ID: 0805115-06

Level (low/med): LOW Date Received: 05/13/08

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	50.0	U		P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	3.0	U		P
7440-39-3	Barium	5.0	U		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	1000	U		P
7440-47-3	Chromium	2.0	U		P
7440-48-4	Cobalt	5.0	U		P
7440-50-8	Copper	5.0	U		P
7439-89-6	Iron	30.0	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	1000	U		P
7439-96-5	Manganese	3.0	U		P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	5.0	U		P
7440-09-7	Potassium	1000	U		P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	1000	U		P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	5.0	U		P
7440-66-6	Zinc	5.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Aluminum	10000.0	10359.79	103.6	10000.0	10393.81	103.9	10431.00	104.3	P
Antimony	1000.0	973.36	97.3	1000.0	988.86	98.9	992.41	99.2	P
Arsenic	1000.0	1013.88	101.4	1000.0	1026.26	102.6	1023.25	102.3	P
Barium	1000.0	971.89	97.2	1000.0	991.21	99.1	997.23	99.7	P
Beryllium	1000.0	1070.72	107.1	1000.0	1070.10	107.0	1048.01	104.8	P
Cadmium	1000.0	1052.74	105.3	1000.0	1043.78	104.4	1033.22	103.3	P
Calcium	1000.0	1013.46	101.3	1000.0	1008.10	100.8	956.03	95.6	P
Chromium	1000.0	1003.90	100.4	1000.0	1019.31	101.9	1011.30	101.1	P
Cobalt	1000.0	1011.03	101.1	1000.0	997.54	99.8	980.00	98.0	P
Copper	1000.0	1005.63	100.6	1000.0	1012.92	101.3	1019.71	102.0	P
Iron	10000.0	10272.06	102.7	10000.0	10495.77	105.0	10400.83	104.0	P
Lead	1000.0	1006.84	100.7	1000.0	1010.17	101.0	1003.63	100.4	P
Magnesium	1000.0	957.76	95.8	1000.0	969.71	97.0	964.93	96.5	P
Manganese	1000.0	1042.06	104.2	1000.0	1045.35	104.5	1037.95	103.8	P
Mercury	4.0	3.98	99.5	4.0	4.03	100.8	3.96	99.0	AV
Nickel	1000.0	1008.56	100.9	1000.0	1016.87	101.7	1008.57	100.9	P
Potassium	10000.0	9942.07	99.4	10000.0	9942.91	99.4	10072.39	100.7	P
Selenium	1000.0	1025.67	102.6	1000.0	1004.85	100.5	1003.23	100.3	P
Silver	500.0	476.82	95.4	500.0	485.19	97.0	482.77	96.6	P
Sodium	11000.0	11180.85	101.6	11000.0	11253.20	102.3	11261.35	102.4	P
Thallium	1000.0	967.90	96.8	1000.0	1004.71	100.5	997.12	99.7	P
Vanadium	1000.0	997.38	99.7	1000.0	1005.39	100.5	999.08	99.9	P
Zinc	1000.0	1031.30	103.1	1000.0	1036.01	103.6	1010.28	101.0	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum				10000.0	10263.47	102.6	10071.36	100.7	P
Antimony				1000.0	952.52	95.3	946.42	94.6	P
Arsenic				1000.0	981.14	98.1	960.49	96.0	P
Barium				1000.0	962.43	96.2	944.12	94.4	P
Beryllium				1000.0	1039.13	103.9	1003.96	100.4	P
Cadmium				1000.0	1007.05	100.7	999.51	100.0	P
Calcium				1000.0	977.46	97.7	941.45	94.1	P
Chromium				1000.0	971.97	97.2	954.00	95.4	P
Cobalt				1000.0	984.31	98.4	959.49	95.9	P
Copper				1000.0	993.32	99.3	971.20	97.1	P
Iron				10000.0	9927.24	99.3	9696.60	97.0	P
Lead				1000.0	977.39	97.7	959.12	95.9	P
Magnesium				1000.0	926.28	92.6	911.52	91.2	P
Manganese				1000.0	1006.47	100.6	988.17	98.8	P
Nickel				1000.0	971.25	97.1	958.06	95.8	P
Potassium				10000.0	10178.04	101.8	9942.37	99.4	P
Selenium				1000.0	989.12	98.9	972.68	97.3	P
Silver				500.0	478.66	95.7	463.74	92.7	P
Sodium				11000.0	11257.43	102.3	10948.65	99.5	P
Thallium				1000.0	930.95	93.1	911.27	91.1	P
Vanadium				1000.0	969.72	97.0	950.67	95.1	P
Zinc				1000.0	974.94	97.5	952.88	95.3	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Manganese	1000.0	1039.25	103.9	1000.0	1034.85	103.5	972.52	97.3	P
Mercury	4.0	3.58	89.5	4.0	3.63	90.8	3.54	88.5	AV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Manganese				1000.0	999.29	99.9			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2B-IN

CRDL STANDARD FOR AA AND ICP

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

AA CRDL Standard Source: _____

ICP CRDL Standard Source: Spex

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120.0	118.67	98.9		
Arsenic				20.0	21.80	109.0		
Barium								
Beryllium				10.0	10.69	106.9		
Cadmium				10.0	10.57	105.7		
Calcium								
Chromium				20.0	20.46	102.3		
Cobalt				100.0	98.50	98.5		
Copper				50.0	49.35	98.7		
Iron								
Lead				6.0	5.90	98.3		
Magnesium								
Manganese				30.0	31.09	103.6		
Nickel				80.0	80.26	100.3		
Potassium								
Selenium				10.0	10.13	101.3		
Silver				20.0	19.86	99.3		
Sodium								
Thallium				20.0	21.22	106.1		
Vanadium				100.0	99.73	99.7		
Zinc				40.0	40.98	102.4		

Control Limits: no limits have been established by EPA at this time

USEPA - CLP

2B-IN

CRDL STANDARD FOR AA AND ICP

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

AA CRDL Standard Source: _____

ICP CRDL Standard Source: Spex

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Manganese				30.0	31.14	103.8		

Control Limits: no limits have been established by EPA at this time

USEPA - CLP

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	50.0	U	50.0	U	50.0	U	50.0	U	50.000	U	P
Antimony	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Barium	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Calcium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Chromium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	P
Cobalt	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Copper	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Iron	30.0	U	30.0	U	30.0	U	30.0	U	30.000	U	P
Lead	1.5	U	1.5	U	1.5	U	1.5	U	1.500	U	P
Magnesium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Manganese	3.0	U	3.0	U	3.0	U	3.0	U	49.983		P
Mercury	0.080	U	0.080	U	0.080	U			0.080	U	AV
Nickel	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Selenium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Silver	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Sodium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Thallium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Vanadium	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P

USEPA - CLP

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum			50.0	U					10.000	U	P
Antimony			5.0	U					1.000	U	P
Arsenic			3.0	U					0.600	U	P
Barium			5.0	U					1.000	U	P
Beryllium			1.0	U					0.200	U	P
Cadmium			1.0	U					0.200	U	P
Calcium			1000.0	U					200.000	U	P
Chromium			2.0	U					0.400	U	P
Cobalt			5.0	U					1.000	U	P
Copper			5.0	U					1.000	U	P
Iron			30.0	U					6.000	U	P
Lead			1.5	U					0.300	U	P
Magnesium			1000.0	U					200.000	U	P
Manganese			3.0	U					0.600	U	P
Nickel			5.0	U					1.000	U	P
Potassium			1000.0	U					200.000	U	P
Selenium			3.0	U					0.600	U	P
Silver			1.0	U					0.200	U	P
Sodium			1000.0	U					200.000	U	P
Thallium			3.0	U					0.600	U	P
Vanadium			5.0	U					1.000	U	P
Zinc			5.0	U					1.000	U	P

USEPA - CLP

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Preparation Blank Matrix (soil/water): WATER - ICP; SOIL - Hg

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L - ICP; mg/kg - Hg SDMO 6/27/06

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Manganese	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Mercury	0.080	U	0.080	U	0.080	U			0.013	U	AV

USEPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

ICP ID Number: TJA61E TRACE ICP ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	500000	500000	516465	517798.5	103.6			
Antimony	0	600	3	600.9	100.2			
Arsenic	0	100	0	102.0	102.0			
Barium	0	500	2	525.0	105.0			
Beryllium	0	500	0	514.5	102.9			
Cadmium	0	1000	3	948.2	94.8			
Calcium	500000	500000	448858	450129.7	90.0			
Chromium	0	500	1	484.0	96.8			
Cobalt	0	500	0	463.9	92.8			
Copper	0	500	1	539.3	107.9			
Iron	200000	200000	197424	197447.9	98.7			
Lead	0	50	2	49.6	99.2			
Magnesium	500000	500000	509941	509372.6	101.9			
Manganese	0	500	-12	487.0	97.4			
Nickel	0	1000	-2	906.4	90.6			
Potassium	0	0	48	31.2				
Selenium	0	50	-7	42.2	84.4			
Silver	0	200	0	207.6	103.8			
Sodium	0	0	239	149.0				
Thallium	0	100	-8	85.1	85.1			
Vanadium	0	500	0	485.5	97.1			
Zinc	0	1000	-14	890.2	89.0			

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

ICP ID Number: TJA61E TRACE ICP ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Manganese	0	500	-12	491.2	98.2			

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB007 (0.5-1.5)S

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Level (low/med): LOW

% Solids for Sample: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		30427.7500		29034.2700		499.50	279.0		P
Antimony	75 - 125	9.7660		1.2369	U	62.44	15.6	N	P
Arsenic	75 - 125	58.3523		1.5614	B	62.44	91.0		P
Barium	75 - 125	556.5089		73.3254		499.50	96.7		P
Beryllium	75 - 125	14.0577		1.1096	B	12.49	103.7		P
Cadmium	75 - 125	32.1497		0.2474	U	31.22	103.0		P
Calcium	75 - 125	3015.3900		2065.3880		1248.75	76.1		P
Chromium	75 - 125	96.7064		59.1040		49.95	75.3		P
Cobalt	75 - 125	132.3924		10.9789		124.88	97.2		P
Copper	75 - 125	92.4124		27.6196		62.44	103.8		P
Iron		67185.2800		90534.1300		249.75	-9348.9		P
Lead	75 - 125	84.3056		29.1667		62.44	88.3		P
Magnesium	75 - 125	2604.9050		1405.1460		1248.75	96.1		P
Manganese		771.0342		1128.4230		124.88	-286.2		P
Nickel	75 - 125	136.3696		11.6772		124.88	99.8		P
Potassium	75 - 125	2376.6380		1012.7220	B	1248.75	109.2		P
Selenium	75 - 125	53.5347		0.7421	U	62.44	85.7		P
Silver	75 - 125	62.3475		0.2474	U	62.44	99.9		P
Sodium	75 - 125	1314.6980		247.3717	U	1248.75	105.3		P
Thallium	75 - 125	58.7790		0.7421	U	62.44	94.1		P
Vanadium	75 - 125	206.6229		89.0723		124.88	94.1		P
Zinc	75 - 125	170.1828		53.8688		124.88	93.1		P

Comments:

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB007 (0.5-1.5)SD

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Level (low/med): LOW

% Solids for Sample: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		29929.6800		29034.2700		494.74	181.0		P
Antimony	75 - 125	7.7041		1.2369	U	61.84	12.5	N	P
Arsenic	75 - 125	56.4172		1.5614	B	61.84	88.7		P
Barium	75 - 125	546.2267		73.3254		494.74	95.6		P
Beryllium	75 - 125	13.7180		1.1096	B	12.37	101.9		P
Cadmium	75 - 125	31.3836		0.2474	U	30.92	101.5		P
Calcium	75 - 125	2936.9160		2065.3880		1236.86	70.5	N	P
Chromium	75 - 125	96.2842		59.1040		49.47	75.2		P
Cobalt	75 - 125	128.0305		10.9789		123.69	94.6		P
Copper	75 - 125	88.5966		27.6196		61.84	98.6		P
Iron		58947.3000		90534.1300		247.37	-12769.		P
Lead	75 - 125	82.1399		29.1667		61.84	85.7		P
Magnesium	75 - 125	2567.5280		1405.1460		1236.86	94.0		P
Manganese		663.4289		1128.4230		123.69	-375.9		P
Nickel	75 - 125	133.7789		11.6772		123.69	98.7		P
Potassium	75 - 125	2375.0880		1012.7220	B	1236.86	110.1		P
Selenium	75 - 125	53.6378		0.7421	U	61.84	86.7		P
Silver	75 - 125	61.2656		0.2474	U	61.84	99.1		P
Sodium	75 - 125	1295.1020		247.3717	U	1236.86	104.7		P
Thallium	75 - 125	58.1409		0.7421	U	61.84	94.0		P
Vanadium	75 - 125	199.4434		89.0723		123.69	89.2		P
Zinc	75 - 125	164.3014		53.8688		123.69	89.3		P

Comments:

USEPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB007 (0.5-1.5)A

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS _____ SDG No.: Radford002

Matrix (soil/water): SOLID Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added(SA)	%R	Q	M
Aluminum		119576.00		117371.02		2000.0	110.2		P
Antimony		250.94		5.00	U	250.0	100.4		P
Arsenic		269.64		6.31	B	250.0	105.3		P
Barium		2372.44		296.42		2000.0	103.8		P
Beryllium		57.81		4.49	B	50.0	106.6		P
Cadmium		130.91		1.00	U	125.0	104.7		P
Calcium		13470.94		8349.33		5000.0	102.4		P
Chromium		447.01		238.93		200.0	104.0		P
Cobalt		547.25		44.38		500.0	100.6		P
Copper		382.41		111.65		250.0	108.3		P
Iron		364407.10		365984.16		1000.0	-157.7		P
Lead		374.14		117.91		250.0	102.5		P
Magnesium		10531.81		5680.30		5000.0	97.0		P
Manganese		5057.62		4561.65		500.0	99.2		P
Nickel		557.93		47.20		500.0	102.1		P
Potassium		9934.19		4093.93	B	5000.0	116.8		P
Selenium		244.14		3.00	U	250.0	97.7		P
Silver		255.00		1.00	U	250.0	102.0		P
Sodium		5418.41		1000.00	U	5000.0	108.4		P
Thallium		237.44		3.00	U	250.0	95.0		P
Vanadium		876.25		360.07		500.0	103.2		P
Zinc		724.42		217.76		500.0	101.3		P

Comments: _____

6
DUPLICATES

SAMPLE NO.

1034SB007 (0.5-1.5)SD

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Matrix (soil/water): SOLID Level (low/med): LOW

% Solids for Sample: 77.0 % Solids for Duplicate: 77.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		30427.7500		29929.6800		1.7		P
Antimony		9.7660		7.7041		23.6	*	P
Arsenic		58.3523		56.4172		3.4		P
Barium		556.5089		546.2267		1.9		P
Beryllium		14.0577		13.7180		2.4		P
Cadmium		32.1497		31.3836		2.4		P
Calcium		3015.3900		2936.9160		2.6		P
Chromium		96.7064		96.2842		0.4		P
Cobalt		132.3924		128.0305		3.3		P
Copper		92.4124		88.5966		4.2		P
Iron		67185.2800		58947.3000		13.1		P
Lead		84.3056		82.1399		2.6		P
Magnesium		2604.9050		2567.5280		1.4		P
Manganese		771.0342		663.4289		15.0		P
Nickel		136.3696		133.7789		1.9		P
Potassium		2376.6380		2375.0880		0.1		P
Selenium		53.5347		53.6378		0.2		P
Silver		62.3475		61.2656		1.8		P
Sodium		1314.6980		1295.1020		1.5		P
Thallium		58.7790		58.1409		1.1		P
Vanadium		206.6229		199.4434		3.5		P
Zinc		170.1828		164.3014		3.5		P

7

LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Solid LCS Source: HighPurity

Aqueous LCS Source: HighPurity

Analyte	Aqueous (ug/L)			Solid (mg/kg)				
	True	Found	%R	True	Found	C	Limits	%R
Aluminum	2000.0	2152.20	107.6	400.0	448.2		320.0 480.0	112.0
Antimony	250.0	251.41	100.6	50.0	51.0		40.0 60.0	102.0
Arsenic	250.0	258.91	103.6	50.0	52.3		40.0 60.0	104.6
Barium	2000.0	1989.06	99.5	400.0	414.2		320.0 480.0	103.6
Beryllium	50.0	55.92	111.8	10.0	10.9		8.0 12.0	109.0
Cadmium	125.0	131.84	105.5	25.0	27.1		20.0 30.0	108.4
Calcium	5000.0	5051.07	101.0	1000.0	1048.8		800.0 1200.0	104.9
Chromium	200.0	203.78	101.9	40.0	42.8		32.0 48.0	107.0
Cobalt	500.0	494.00	98.8	100.0	102.8		80.0 120.0	102.8
Copper	250.0	257.02	102.8	50.0	52.7		40.0 60.0	105.4
Iron	1000.0	1045.94	104.6	200.0	220.0		160.0 240.0	110.0
Lead	250.0	256.54	102.6	50.0	52.3		40.0 60.0	104.6
Magnesium	5000.0	4800.10	96.0	1000.0	995.9	B	800.0 1200.0	99.6
Manganese	500.0	523.34	104.7	100.0	108.8		80.0 120.0	108.8
Mercury	2.00	1.97	98.5					
Nickel	500.0	498.39	99.7	100.0	104.1		80.0 120.0	104.1
Potassium	5000.0	4565.64	91.3	1000.0	1099.0		800.0 1200.0	109.9
Selenium	250.0	247.61	99.0	50.0	49.3		40.0 60.0	98.6
Silver	250.0	247.51	99.0	50.0	51.3		40.0 60.0	102.6
Sodium	5000.0	5195.35	103.9	1000.0	1060.6		800.0 1200.0	106.1
Thallium	250.0	244.16	97.7	50.0	49.2		40.0 60.0	98.4
Vanadium	500.0	504.24	100.8	100.0	105.3		80.0 120.0	105.3
Zinc	500.0	508.56	101.7	100.0	106.7		80.0 120.0	106.7

7

LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford002

Solid LCS Source: HighPurity

Aqueous LCS Source: HighPurity

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Manganese	500.0	475.33	95.1						
Mercury				0.33	0.30		0.3	0.4	90.9

Arcadis

SDG #Radford003

Summary Package

Semi-Volatile Section

ORGANIC CASE NARRATIVE - Semivolatiles
Arcadis – Radford003

Date Sampled	Date Received	Lab ID	Client ID
05/07/08	05/08/08	0805074-06	1549SB001(7-8)
05/07/08	05/08/08	0805074-09	1549SB004(5-6)
05/07/08	05/08/08	0805074-11	1549SB006(5-6)
05/07/08	05/08/08	0805074-12	1549SB003(5-6)
05/08/08	05/09/08	0805095-02	1034SB004 (5-6)
05/08/08	05/09/08	0805095-04	1041SB002 (7-8)
05/08/08	05/09/08	0805095-08	1041SB004 (7-8)
05/08/08	05/09/08	0805095-10	1034SB001 (7-8)
05/08/08	05/09/08	0805095-12	1034SB008 (4-5)
05/09/08	05/10/08	0805105-01	1041SB003 (7-8)
05/09/08	05/10/08	0805105-02	1041SB001 (7-8)
05/09/08	05/10/08	0805105-03	1034SB006 (7-8)
05/09/08	05/10/08	0805105-04	1034SB007 (7-8)

Method: The samples were extracted/analyzed by USEPA SW-846 Methods 3541/8270C (automated soxhlet extraction followed by capillary column GC/MS) for soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note1: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction for the included samples was requested 5/19/08 – analysis was requested 6/9/08. E-mail instructions are attached.
- DFTPP Tuning: All method tuning criteria were met. Radford criteria were exceeded as indicated in the following clarifications:

1. BNA3 ICV analyzed with the initial calibration exceeded 20% difference for benzo(g,h,i)perylene, 4-chloro-3-methylphenol, 2,4-dimethylphenol, hexachlorocyclopentadiene, 4-nitroaniline and pyrene with positive biases at 22.6%, 23.5%, 24.9%, 25.6%, 23.9% and 23.3%, respectively. Reported concentrations in the associated samples are qualified with an "X" for a potential positive bias.
2. BNA3 CCV analyzed 6/9/08 at 14:32 exceeded 20% difference for benzo(g,h,i)perylene, 3,3'-dichlorobenzidine, 2,4-dinitrophenol, hexachlorocyclopentadiene, 4-nitroaniline and pyrene with positive or negative biases as indicated at +29.9%, -31.2%%, +21.0%, -34.4%, +47.0 and -24.1%, respectively. All results for analytes with a negative bias are qualified with a "Y" on the form Is and EDD for a potential negative bias. Reported concentrations for analytes with a positive bias are qualified with an "X" on the form Is and EDD for a potential positive bias.

- Blank Results: Method blank SBLK0520BS2 reported a concentration of di-n-butyl phthalate less than half the quantitation limit. It was not detected in the associated samples.
- Surrogate Recoveries: All surrogate recoveries were within limits.
- SBLK0520BS2LCS results: Recovery of benzaldehyde was below the limit of 10% at 4% while recoveries of caprolactam, 2,4-dinitrophenol and 4-nitroaniline exceeded the limits with a positive bias. All other recoveries were within limits.
- 1034SB007 (7-8)MS/MSD Results: 4 of 130 recoveries were outside the established limits with all relative percent differences within limits. See form 3.
- Internal Standard Area Counts: All area counts were within limits.
- Dilutions: All samples were analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Monday, June 09, 2008 9:26 AM
To: MMcGinnity@EmpirLabs.com
Cc: Sharpe, Christopher; Powell, Jace'que; Borne, Rachelle
Subject: RADford Hold Samples

Hi Marcia

Authorization has been given for all of the remaining samples (approximately 12) to be analyzed for all parameters listed on the COCs: SVOCs, Explosives, PCBs, and Metals. These are the samples beginning with 1034, 1041, and 1549.

Can you please log these in for analysis for standard TAT and let me know what the due date will be? I think that would be June 30th, but if you can get them done quicker since they are already extracted that would be great.

The 2 Ditch samples that were cancelled, remain cancelled.

Thanks
Jane

Jane Kennedy
Principal Scientist
ARCADIS US, Inc.
3850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002
Phone: (504) 832-4174 Ext 106
Cell: (225) 205-8256
E-mail: jane.kennedy@arcadis-us.com

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ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

05072008-01

Project Number/Name GP08RAAP.0047 /RAAP

Project Location Radford, VA

Laboratory Empirical Labratories

Project Manager Tim Llewellyn \ Diane Misbeck

Sampler(s)/Affiliation SG, MW (ARCADIS)

2 coolers

0805074

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs	SVOCs	PCBs	Metals	Explosives		Remarks	Total
-01	SDITCHHP003(0506200	GW	5/6/08 1940		X						24 hr TAT	3
-02	SDITCHHP004(0506200	GW	5/6/08 1750		X						24 hr TAT	3
-03	SDUP001(05062008)	GW	5/6/08 1940		X						24 hr TAT	3
-04	1549SB003(0.5-1.5)	SO	5/7/08 10:00		X	X	X	X	X			6
-05	1549SB001(0.5-1.5)	SO	5/7/08 10:40		X	X	X	X	X			6
-06	1549SB001(7-8)	SO	5/7/08 10:50		X	X	X	X	X		(4) hold pending shallow sample	6
-07	1549DUP002(0.5-1.5)	SO	5/7/08 12:00		X	X	X	X	X			6
-08	1549SB004(0.5-1.5)	SO	5/7/08 11:45		X	X	X	X	X			6
-09	1549SB004(5-6)	SO	5/7/08 12:00		X	X	X	X	X		(4) hold pending shallow sample	6
-10	1549SB006(0.5-1.5)	SO	5/7/08 12:15		X	X	X	X	X			6
-11	1549SB006(5-6)	SO	5/7/08 12:25		X	X	X	X	X		(4) hold pending shallow sample	6
-12	1549SB003(5-6)	SO	5/7/08 15:00		X	X	X	X	X		(4) hold pending shallow sample	6
-13	TB2(05072008-01)	L	5/7/08 -		X							2

Sample Matrix: L = Liquid; S = Solid; A = Air GW = groundwater 3.2°C, 3.8°C

Total No. of Bottles/Containers 65

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 5/7/08	Time 17:45	Seal Intact?	Yes No N/A
Received by:	Organization:	Date / /	Time		
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical Labs	Date 5/8/08	Time 9:00		Yes No N/A

Special Instructions/Remarks: (1) Questions contact Sandra Grabowski at 410-713-9921 or Jacqyne Powell at 281-509-6407 (2) 24 hour turn around time on groundwater samples, as noted above (3) please hold noted soil samples pending shallow sample results at corresponding location (4) *two coolers*

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-12/01

05062008-01

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name GP08 RAAP.0047 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck / Tim Llewellyn

Sampler(s)/Affiliation SG / ARCADIS

5805095

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs	SVOCs	PCBs	Explosives	Metals		Remarks	Total
-01	1034SB004 (0.5-1.5)	SO	5/8/08 8:30		X	X	X	X	X			6
-02	1034SB004 (5-6)	SO	5/8/08 8:45		X	X	X	X	X		(2) hold pending shallow sample result	6
-03	1041SB002 (1-2)	SO	5/8/08 0900		X	X	X	X	X			6
-04	1041SB002 (7-8)	SO	5/8/08 9:20		X	X	X	X	X		(2) hold pending shallow sample results	6
-05	1041HP002 (05062008)	GW	5/8/08 11:00		X	X	X	X	X			10
-06	TB3 (05062008-01)	L	5/8/08 —		X	X	X	X	X			2
-07	1041SB004 (0-1)	SO	5/8/08 13:50		X	X	X	X	X			6
-08	1041SB004 (7-8)	SO	5/8/08 14:00		X	X	X	X	X		(2) hold pending shallow sample result	6
-09	1034SB001 (0.5-1.5)	SO	5/8/08 14:20		X	X	X	X	X			6
-10	1034SB001 (7-8)	SO	5/8/08 14:50		X	X	X	X	X		(2) hold pending shallow sample result	6
-11	1034SB008 (0.5-1.5)	SO	5/8/08 15:20		X	X	X	X	X			6
-12	1034SB008 (4-5)	SO	5/8/08 15:30		X	X	X	X	X		(2) hold pending shallow sample (3) only 2 encores collected	5

Sample Matrix: L = Liquid; S = Solid; A = Air GW = groundwater 3.4°C, 2.7°C

Total No. of Bottles/Containers: 71

					Seal Intact?
Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 5/8/08	Time 1745		Yes No N/A
Received by:	Organization:	Date / /	Time		
Relinquished by:	Organization:	Date / /	Time		Seal Intact?
Received by:	Organization: Empirical	Date 5/9/08	Time 0900		Yes No N/A

Special Instructions/Remarks: (1) Questions, contact Sandra Grabowski 410-713-9921 or Jacque Powell 281-509-6407

(2) hold marked soil samples pending corresponding shallow sample results

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

05082008-03

Page 3 of 3

Project Number/Name EP08RAAP.0047 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck/Tim Hayden

Sampler(s)/Affiliation SG/MW ARCADIS

0805105

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs	SVOCs, PCBs	Metals	Explosives			Remarks	Total
-01	1041SB003(7-8)	SO	5/9/08 10:46		X	X	X	X			(*)HOLD	6
-02	1041SB004(7-8)	SO	5/9/08 12:25		X	X	X	X			(*)HOLD	6
-03	1034SB006(7-8)	SO	5/9/08 13:00		X	X	X	X			(*)HOLD	6
-04	1034SB007(7-8)	SO	5/9/08 13:40		X	X	X	X			(*)HOLD	6

ANALYSIS / METHOD / SIZE

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 24

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 5/9/08	Time 17:15	Seal Intact?	Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____		
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: [signature]	Organization: Empirical Labs	Date 5/12/08	Time 9:00	(Yes) No N/A	

Special Instructions/Remarks:

(*) HOLD above samples pending results from sample listed on previous page (05092008-02)

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805074 COC ID(s): 05072008-01

Client Arcadis Project Radford

Sample Custodian WS Today's Date 5/8/08

Date/Time Samples Received 5/8/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/8/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 5/7/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
WS 5/8/08
Frozen _____

# of Coolers 2 X Temp. of Coolers ~~4.0C~~ 3.2C, 3.8°C
WS 5/8/08

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805095 COC ID(s): 05082008-01

Client Arcadis Project Radford

Sample Custodian WJS Today's Date 5/9/08

Date/Time Samples Received 5/9/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/9/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 5/8/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 2 Temp. of Coolers 3.4°C, 2.7°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

_____

_____

_____

Comments:

_____

_____

_____

_____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0805105 COC ID(s): 05092008-3

Client Arcadis Project Radford, VA

Sample Custodian WS Today's Date 5/12/08

Date/Time Samples Received 5/12/08 09:00
Airbill Number Fedex
Cooler Opened: Date 5/12/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 5/9/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 3 Temp. of Coolers 1.5°C, 2.4°C, 3.2°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

Sample Delivery Group Assignment Form

CLIENT: Arcadis
PROJECT NAME: RAAD
SDG # Radford003
MATRIX: Groundwater/Soil

QC LEVEL: IV/EDD
Analytical Due: 6/25/2008
Report Due: 6/30/2008
CLOSED: 6/9/2008

Sample Type/count	Date Sampled	Date Rec'd	Lab ID	Client ID	SVOC 8270	PCBs 8082	EXPL+2 8330B	TAL Metals 6010B/7471A
1	05/07/08	05/08/08	0805074-06	1549SB001(7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
2	05/07/08	05/08/08	0805074-09	1549SB004(5-6)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
3	05/07/08	05/08/08	0805074-11	1549SB006(5-6)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
4	05/07/08	05/08/08	0805074-12	1549SB003(5-6)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
5	05/08/08	05/09/08	0805095-02	1034SB004 (5-6)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
6	05/08/08	05/09/08	0805095-04	1041SB002 (7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
7	05/08/08	05/09/08	0805095-08	1041SB004 (7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
8	05/08/08	05/09/08	0805095-10	1034SB001 (7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
9	05/08/08	05/09/08	0805095-12	1034SB008 (4-5)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
10	05/09/08	05/10/08	0805105-01	1041SB003 (7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
11	05/09/08	05/10/08	0805105-02	1041SB001 (7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
12	05/09/08	05/10/08	0805105-03	1034SB006 (7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD
13	05/09/08	05/10/08	0805105-04	1034SB007 (7-8)	Extr/Hold 5/16	Extr/Hold 5/16	Extr/Hold 5/16	HOLD

Extractables requested for extraction 5/16/08. All samples requested for analysis 6/9/08.

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB001(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507406

% Moisture: 15 decanted: (Y/N) N Date Sampled: 05/07/08 10:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 19:38

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
83-32-9	Acenaphthene	31	390		U
208-96-8	Acenaphthylene	23	390		U
98-86-2	Acetophenone	48	390		U
1912-24-9	Atrazine	33	390		U
120-12-7	Anthracene	32	390		U
100-52-7	Benzaldehyde	65	390		U
56-55-3	Benzo(a)anthracene	43	160		U
205-99-2	Benzo(b)fluoranthene	37	160		U
207-08-9	Benzo(k)fluoranthene	46	390		U
191-24-2	Benzo(g,h,i)perylene	83	390		U
50-32-8	Benzo(a)pyrene	27	160		U
92-52-4	1,1'-Biphenyl	35	390		U
111-91-1	bis(2-Chloroethoxy)methane	36	390		U
111-44-4	bis(2-Chloroethyl)ether	48	390		U
108-60-1	bis(2-Chloroisopropyl)ether	60	390		U
117-81-7	Bis(2-ethylhexyl)phthalate	42	390		U
101-55-3	4-Bromophenyl-phenylether	30	390		U
85-68-7	Butylbenzylphthalate	35	390		U
105-60-2	Caprolactam	79	390		U
86-74-8	Carbazole	42	390		U
106-47-8	4-Chloroaniline	56	390		U
59-50-7	4-Chloro-3-methylphenol	33	390		U
91-58-7	2-Chloronaphthalene	38	390		U
95-57-8	2-Chlorophenol	48	390		U
7005-72-3	4-Chlorophenyl-phenylether	36	390		U
218-01-9	Chrysene	36	390		U
53-70-3	Dibenz(a,h)anthracene	71	160		U
132-64-9	Dibenzofuran	29	390		U
91-94-1	3,3'-Dichlorobenzidine	37	390		UY
120-83-2	2,4-Dichlorophenol	22	390		U
84-66-2	Diethylphthalate	40	390		U
105-67-9	2,4-Dimethylphenol	25	1600		U
131-11-3	Dimethylphthalate	36	390		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1549SB001(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507406

% Moisture: 15 decanted: (Y/N) N Date Sampled: 05/07/08 10:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 19:38

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	36	390		U
534-52-1	4,6-Dinitro-2-methylphenol	26	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	28	390		U
606-20-2	2,6-Dinitrotoluene	44	390		U
117-84-0	Di-n-octylphthalate	32	390		U
206-44-0	Fluoranthene	63	390		U
86-73-7	Fluorene	31	390		U
118-74-1	Hexachlorobenzene	41	390		U
87-68-3	Hexachlorobutadiene	38	390		U
77-47-4	Hexachlorocyclopentadiene	72	390		UY
67-72-1	Hexachloroethane	46	390		U
193-39-5	Indeno(1,2,3-cd)pyrene	54	160		U
78-59-1	Isophorone	33	390		U
91-57-6	2-Methylnaphthalene	41	390		U
91-20-3	Naphthalene	38	390		U
95-48-7	2-Methylphenol	45	390		U
106-44-5	4-Methylphenol	31	390		U
88-74-4	2-Nitroaniline	38	1600		U
99-09-2	3-Nitroaniline	56	1600		U
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	41	390		U
88-75-5	2-Nitrophenol	26	390		U
100-02-7	4-Nitrophenol	95	1600		U
86-30-6	N-Nitrosodiphenylamine (1)	38	390		U
621-64-7	N-Nitroso-di-n-propylamine	64	390		U
87-86-5	Pentachlorophenol	40	1600		U
108-95-2	Phenol	42	390		U
129-00-0	Pyrene	47	390		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	120	390		U
95-95-4	2,4,5-Trichlorophenol	31	390		U
88-06-2	2,4,6-Trichlorophenol	41	390		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-09

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0507409

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 20:05

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	33	420		U
208-96-8	Acenaphthylene	25	420		U
98-86-2	Acetophenone	52	420		U
1912-24-9	Atrazine	36	420		U
120-12-7	Anthracene	34	420		U
100-52-7	Benzaldehyde	70	420		U
56-55-3	Benzo(a)anthracene	46	170		U
205-99-2	Benzo(b)fluoranthene	40	170		U
207-08-9	Benzo(k)fluoranthene	50	420		U
191-24-2	Benzo(g,h,i)perylene	89	420		U
50-32-8	Benzo(a)pyrene	29	170		U
92-52-4	1,1'-Biphenyl	37	420		U
111-91-1	bis(2-Chloroethoxy)methane	39	420		U
111-44-4	bis(2-Chloroethyl)ether	52	420		U
108-60-1	bis(2-Chloroisopropyl)ether	65	420		U
117-81-7	Bis(2-ethylhexyl)phthalate	46	420		U
101-55-3	4-Bromophenyl-phenylether	33	420		U
85-68-7	Butylbenzylphthalate	38	420		U
105-60-2	Caprolactam	85	420		U
86-74-8	Carbazole	46	420		U
106-47-8	4-Chloroaniline	60	420		U
59-50-7	4-Chloro-3-methylphenol	35	420		U
91-58-7	2-Chloronaphthalene	40	420		U
95-57-8	2-Chlorophenol	52	420		U
7005-72-3	4-Chlorophenyl-phenylether	39	420		U
218-01-9	Chrysene	39	420		U
53-70-3	Dibenz(a,h)anthracene	76	170		U
132-64-9	Dibenzofuran	31	420		U
91-94-1	3,3'-Dichlorobenzidine	40	420		UY
120-83-2	2,4-Dichlorophenol	24	420		U
84-66-2	Diethylphthalate	43	420		U
105-67-9	2,4-Dimethylphenol	27	1700		U
131-11-3	Dimethylphthalate	38	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-09

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0507409

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 20:05

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	38	420		U
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U
117-84-0	Di-n-octylphthalate	34	420		U
206-44-0	Fluoranthene	68	420		U
86-73-7	Fluorene	33	420		U
118-74-1	Hexachlorobenzene	44	420		U
87-68-3	Hexachlorobutadiene	41	420		U
77-47-4	Hexachlorocyclopentadiene	77	420		UY
67-72-1	Hexachloroethane	50	420		U
193-39-5	Indeno(1,2,3-cd)pyrene	58	170		U
78-59-1	Isophorone	36	420		U
91-57-6	2-Methylnaphthalene	44	420		U
91-20-3	Naphthalene	41	420		U
95-48-7	2-Methylphenol	49	420		U
106-44-5	4-Methylphenol	34	420		U
88-74-4	2-Nitroaniline	40	1700		U
99-09-2	3-Nitroaniline	60	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	44	420		U
88-75-5	2-Nitrophenol	28	420		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	40	420		U
621-64-7	N-Nitroso-di-n-propylamine	69	420		U
87-86-5	Pentachlorophenol	43	1700		U
108-95-2	Phenol	46	420		U
129-00-0	Pyrene	50	420		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	130	420		U
95-95-4	2,4,5-Trichlorophenol	34	420		U
88-06-2	2,4,6-Trichlorophenol	44	420		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507411

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/07/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 20:33

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	33	420		U
208-96-8	Acenaphthylene	25	420		U
98-86-2	Acetophenone	52	420		U
1912-24-9	Atrazine	36	420		U
120-12-7	Anthracene	34	420		U
100-52-7	Benzaldehyde	70	420		U
56-55-3	Benzo(a)anthracene	46	170		U
205-99-2	Benzo(b)fluoranthene	40	170		U
207-08-9	Benzo(k)fluoranthene	50	420		U
191-24-2	Benzo(g,h,i)perylene	89	420		U
50-32-8	Benzo(a)pyrene	29	170		U
92-52-4	1,1'-Biphenyl	37	420		U
111-91-1	bis(2-Chloroethoxy)methane	39	420		U
111-44-4	bis(2-Chloroethyl)ether	52	420		U
108-60-1	bis(2-Chloroisopropyl)ether	65	420		U
117-81-7	Bis(2-ethylhexyl)phthalate	46	420		U
101-55-3	4-Bromophenyl-phenylether	33	420		U
85-68-7	Butylbenzylphthalate	38	420		U
105-60-2	Caprolactam	85	420		U
86-74-8	Carbazole	46	420		U
106-47-8	4-Chloroaniline	61	420		U
59-50-7	4-Chloro-3-methylphenol	35	420		U
91-58-7	2-Chloronaphthalene	40	420		U
95-57-8	2-Chlorophenol	52	420		U
7005-72-3	4-Chlorophenyl-phenylether	39	420		U
218-01-9	Chrysene	39	420		U
53-70-3	Dibenz(a,h)anthracene	76	170		U
132-64-9	Dibenzofuran	31	420		U
91-94-1	3,3'-Dichlorobenzidine	40	420		UY
120-83-2	2,4-Dichlorophenol	24	420		U
84-66-2	Diethylphthalate	43	420		U
105-67-9	2,4-Dimethylphenol	27	1700		U
131-11-3	Dimethylphthalate	39	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507411

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/07/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 20:33

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	38	420		U
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U
117-84-0	Di-n-octylphthalate	34	420		U
206-44-0	Fluoranthene	68	420		U
86-73-7	Fluorene	33	420		U
118-74-1	Hexachlorobenzene	44	420		U
87-68-3	Hexachlorobutadiene	42	420		U
77-47-4	Hexachlorocyclopentadiene	78	420		UY
67-72-1	Hexachloroethane	50	420		U
193-39-5	Indeno(1,2,3-cd)pyrene	58	170		U
78-59-1	Isophorone	36	420		U
91-57-6	2-Methylnaphthalene	44	420		U
91-20-3	Naphthalene	41	420		U
95-48-7	2-Methylphenol	49	420		U
106-44-5	4-Methylphenol	34	420		U
88-74-4	2-Nitroaniline	41	1700		U
99-09-2	3-Nitroaniline	60	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	44	420		U
88-75-5	2-Nitrophenol	28	420		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	40	420		U
621-64-7	N-Nitroso-di-n-propylamine	70	420		U
87-86-5	Pentachlorophenol	43	1700		U
108-95-2	Phenol	46	420		U
129-00-0	Pyrene	50	420		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	130	420		U
95-95-4	2,4,5-Trichlorophenol	34	420		U
88-06-2	2,4,6-Trichlorophenol	44	420		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-12

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507412

% Moisture: 13 decanted: (Y/N) N Date Sampled: 05/07/08 15:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/10/08 00:39

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	30	380		U
208-96-8	Acenaphthylene	23	380		U
98-86-2	Acetophenone	47	380		U
1912-24-9	Atrazine	33	380		U
120-12-7	Anthracene	31	380		U
100-52-7	Benzaldehyde	64	380		U
56-55-3	Benzo(a)anthracene	42	150		U
205-99-2	Benzo(b)fluoranthene	36	150		U
207-08-9	Benzo(k)fluoranthene	45	380		U
191-24-2	Benzo(g,h,i)perylene	82	380		U
50-32-8	Benzo(a)pyrene	26	150		U
92-52-4	1,1'-Biphenyl	34	380		U
111-91-1	bis(2-Chloroethoxy)methane	36	380		U
111-44-4	bis(2-Chloroethyl)ether	47	380		U
108-60-1	bis(2-Chloroisopropyl)ether	59	380		U
117-81-7	Bis(2-ethylhexyl)phthalate	42	380		U
101-55-3	4-Bromophenyl-phenylether	30	380		U
85-68-7	Butylbenzylphthalate	34	380		U
105-60-2	Caprolactam	78	380		U
86-74-8	Carbazole	42	380		U
106-47-8	4-Chloroaniline	55	380		U
59-50-7	4-Chloro-3-methylphenol	32	380		U
91-58-7	2-Chloronaphthalene	37	380		U
95-57-8	2-Chlorophenol	47	380		U
7005-72-3	4-Chlorophenyl-phenylether	36	380		U
218-01-9	Chrysene	36	380		U
53-70-3	Dibenz(a,h)anthracene	69	150		U
132-64-9	Dibenzofuran	28	380		U
91-94-1	3,3'-Dichlorobenzidine	36	380		UY
120-83-2	2,4-Dichlorophenol	22	380		U
84-66-2	Diethylphthalate	39	380		U
105-67-9	2,4-Dimethylphenol	25	1500		U
131-11-3	Dimethylphthalate	35	380		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-12

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0507412

% Moisture: 13 decanted: (Y/N) N Date Sampled: 05/07/08 15:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/10/08 00:39

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	35	380		U
534-52-1	4,6-Dinitro-2-methylphenol	25	1500		U
51-28-5	2,4-Dinitrophenol	150	1500		U
121-14-2	2,4-Dinitrotoluene	28	380		U
606-20-2	2,6-Dinitrotoluene	44	380		U
117-84-0	Di-n-octylphthalate	31	380		U
206-44-0	Fluoranthene	62	380		U
86-73-7	Fluorene	30	380		U
118-74-1	Hexachlorobenzene	40	380		U
87-68-3	Hexachlorobutadiene	38	380		U
77-47-4	Hexachlorocyclopentadiene	71	380		UY
67-72-1	Hexachloroethane	45	380		U
193-39-5	Indeno(1,2,3-cd)pyrene	53	150		U
78-59-1	Isophorone	33	380		U
91-57-6	2-Methylnaphthalene	40	380		U
91-20-3	Naphthalene	37	380		U
95-48-7	2-Methylphenol	45	380		U
106-44-5	4-Methylphenol	31	380		U
88-74-4	2-Nitroaniline	37	1500		U
99-09-2	3-Nitroaniline	54	1500		U
100-01-6	4-Nitroaniline	120	1500		U
98-95-3	Nitrobenzene	40	380		U
88-75-5	2-Nitrophenol	25	380		U
100-02-7	4-Nitrophenol	93	1500		U
86-30-6	N-Nitrosodiphenylamine (1)	37	380		U
621-64-7	N-Nitroso-di-n-propylamine	63	380		U
87-86-5	Pentachlorophenol	39	1500		U
108-95-2	Phenol	42	380		U
129-00-0	Pyrene	46	380		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	120	380		U
95-95-4	2,4,5-Trichlorophenol	31	380		U
88-06-2	2,4,6-Trichlorophenol	40	380		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509502

% Moisture: 37 decanted: (Y/N) N Date Sampled: 05/08/08 18:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 21:00

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	42	520		U
208-96-8	Acenaphthylene	31	520		U
98-86-2	Acetophenone	65	520		U
1912-24-9	Atrazine	45	520		U
120-12-7	Anthracene	43	520		U
100-52-7	Benzaldehyde	87	520		U
56-55-3	Benzo(a)anthracene	57	210		U
205-99-2	Benzo(b)fluoranthene	50	210		U
207-08-9	Benzo(k)fluoranthene	62	520		U
191-24-2	Benzo(g,h,i)perylene	110	520		U
50-32-8	Benzo(a)pyrene	36	210		U
92-52-4	1,1'-Biphenyl	46	520		U
111-91-1	bis(2-Chloroethoxy)methane	49	520		U
111-44-4	bis(2-Chloroethyl)ether	64	520		U
108-60-1	bis(2-Chloroisopropyl)ether	81	520		U
117-81-7	Bis(2-ethylhexyl)phthalate	57	520		U
101-55-3	4-Bromophenyl-phenylether	41	520		U
85-68-7	Butylbenzylphthalate	47	520		U
105-60-2	Caprolactam	110	520		U
86-74-8	Carbazole	57	520		U
106-47-8	4-Chloroaniline	76	520		U
59-50-7	4-Chloro-3-methylphenol	44	520		U
91-58-7	2-Chloronaphthalene	50	520		U
95-57-8	2-Chlorophenol	64	520		U
7005-72-3	4-Chlorophenyl-phenylether	48	520		U
218-01-9	Chrysene	49	520		U
53-70-3	Dibenz(a,h)anthracene	95	210		U
132-64-9	Dibenzofuran	38	520		U
91-94-1	3,3'-Dichlorobenzidine	50	520		UY
120-83-2	2,4-Dichlorophenol	30	520		U
84-66-2	Diethylphthalate	54	520	67	J
105-67-9	2,4-Dimethylphenol	34	2100		U
131-11-3	Dimethylphthalate	48	520		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509502

% Moisture: 37 decanted: (Y/N) N Date Sampled: 05/08/08 18:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 21:00

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	48	520		U
534-52-1	4,6-Dinitro-2-methylphenol	34	2100		U
51-28-5	2,4-Dinitrophenol	210	2100		U
121-14-2	2,4-Dinitrotoluene	38	520		U
606-20-2	2,6-Dinitrotoluene	60	520		U
117-84-0	Di-n-octylphthalate	42	520		U
206-44-0	Fluoranthene	84	520		U
86-73-7	Fluorene	41	520		U
118-74-1	Hexachlorobenzene	55	520		U
87-68-3	Hexachlorobutadiene	52	520		UY
77-47-4	Hexachlorocyclopentadiene	96	520		U
67-72-1	Hexachloroethane	62	520		U
193-39-5	Indeno(1,2,3-cd)pyrene	73	210		U
78-59-1	Isophorone	45	520		U
91-57-6	2-Methylnaphthalene	55	520		U
91-20-3	Naphthalene	51	520		U
95-48-7	2-Methylphenol	61	520		U
106-44-5	4-Methylphenol	42	520		U
88-74-4	2-Nitroaniline	50	2100		U
99-09-2	3-Nitroaniline	74	2100		U
100-01-6	4-Nitroaniline	160	2100		U
98-95-3	Nitrobenzene	54	520		U
88-75-5	2-Nitrophenol	35	520		U
100-02-7	4-Nitrophenol	130	2100		U
86-30-6	N-Nitrosodiphenylamine (1)	50	520		U
621-64-7	N-Nitroso-di-n-propylamine	86	520		U
87-86-5	Pentachlorophenol	53	2100		U
108-95-2	Phenol	57	520		U
129-00-0	Pyrene	63	520		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	160	520		U
95-95-4	2,4,5-Trichlorophenol	42	520		U
88-06-2	2,4,6-Trichlorophenol	55	520		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB002 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509504

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 19:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 21:27

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	34	430		U
208-96-8	Acenaphthylene	25	430		U
98-86-2	Acetophenone	53	430		U
1912-24-9	Atrazine	37	430		U
120-12-7	Anthracene	35	430		U
100-52-7	Benzaldehyde	72	430		U
56-55-3	Benzo(a)anthracene	47	170		U
205-99-2	Benzo(b)fluoranthene	41	170		U
207-08-9	Benzo(k)fluoranthene	51	430		U
191-24-2	Benzo(g,h,i)perylene	91	430		U
50-32-8	Benzo(a)pyrene	30	170		U
92-52-4	1,1'-Biphenyl	38	430		U
111-91-1	bis(2-Chloroethoxy)methane	40	430		U
111-44-4	bis(2-Chloroethyl)ether	53	430		U
108-60-1	bis(2-Chloroisopropyl)ether	66	430		U
117-81-7	Bis(2-ethylhexyl)phthalate	47	430		U
101-55-3	4-Bromophenyl-phenylether	33	430		U
85-68-7	Butylbenzylphthalate	38	430		U
105-60-2	Caprolactam	87	430		U
86-74-8	Carbazole	47	430		U
106-47-8	4-Chloroaniline	62	430		U
59-50-7	4-Chloro-3-methylphenol	36	430		U
91-58-7	2-Chloronaphthalene	41	430		U
95-57-8	2-Chlorophenol	53	430		U
7005-72-3	4-Chlorophenyl-phenylether	40	430		U
218-01-9	Chrysene	40	430		U
53-70-3	Dibenz(a,h)anthracene	78	170		U
132-64-9	Dibenzofuran	32	430		U
91-94-1	3,3'-Dichlorobenzidine	41	430		UY
120-83-2	2,4-Dichlorophenol	24	430		U
84-66-2	Diethylphthalate	44	430		U
105-67-9	2,4-Dimethylphenol	28	1700		U
131-11-3	Dimethylphthalate	39	430		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB002 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509504

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 19:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 21:27

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	39	430		U
534-52-1	4,6-Dinitro-2-methylphenol	28	1700		U
51-28-5	2,4-Dinitrophenol	170	1700		U
121-14-2	2,4-Dinitrotoluene	31	430		U
606-20-2	2,6-Dinitrotoluene	49	430		U
117-84-0	Di-n-octylphthalate	35	430		U
206-44-0	Fluoranthene	69	430		U
86-73-7	Fluorene	34	430		U
118-74-1	Hexachlorobenzene	45	430		U
87-68-3	Hexachlorobutadiene	42	430		U
77-47-4	Hexachlorocyclopentadiene	79	430		UY
67-72-1	Hexachloroethane	51	430		U
193-39-5	Indeno(1,2,3-cd)pyrene	60	170		U
78-59-1	Isophorone	36	430		U
91-57-6	2-Methylnaphthalene	45	430		U
91-20-3	Naphthalene	42	430		U
95-48-7	2-Methylphenol	50	430		U
106-44-5	4-Methylphenol	34	430		U
88-74-4	2-Nitroaniline	41	1700		U
99-09-2	3-Nitroaniline	61	1700		U
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	45	430		U
88-75-5	2-Nitrophenol	28	430		U
100-02-7	4-Nitrophenol	100	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	41	430		U
621-64-7	N-Nitroso-di-n-propylamine	71	430		U
87-86-5	Pentachlorophenol	44	1700		U
108-95-2	Phenol	46	430		U
129-00-0	Pyrene	51	430		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	130	430		U
95-95-4	2,4,5-Trichlorophenol	34	430		U
88-06-2	2,4,6-Trichlorophenol	45	430		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-08

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 0509508

% Moisture: 31 decanted: (Y/N) N Date Sampled: 05/08/08 14:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 21:55

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	38	480		U
208-96-8	Acenaphthylene	28	480		U
98-86-2	Acetophenone	59	480		U
1912-24-9	Atrazine	40	480		U
120-12-7	Anthracene	39	480		U
100-52-7	Benzaldehyde	79	480		U
56-55-3	Benzo(a)anthracene	52	190		U
205-99-2	Benzo(b)fluoranthene	45	190		U
207-08-9	Benzo(k)fluoranthene	56	480		U
191-24-2	Benzo(g,h,i)perylene	100	480		U
50-32-8	Benzo(a)pyrene	33	190		U
92-52-4	1,1'-Biphenyl	42	480		U
111-91-1	bis(2-Chloroethoxy)methane	44	480		U
111-44-4	bis(2-Chloroethyl)ether	58	480		U
108-60-1	bis(2-Chloroisopropyl)ether	73	480		U
117-81-7	Bis(2-ethylhexyl)phthalate	52	480		U
101-55-3	4-Bromophenyl-phenylether	37	480		U
85-68-7	Butylbenzylphthalate	42	480		U
105-60-2	Caprolactam	96	480		U
86-74-8	Carbazole	52	480		U
106-47-8	4-Chloroaniline	68	480		U
59-50-7	4-Chloro-3-methylphenol	40	480		U
91-58-7	2-Chloronaphthalene	46	480		U
95-57-8	2-Chlorophenol	58	480		U
7005-72-3	4-Chlorophenyl-phenylether	44	480		U
218-01-9	Chrysene	44	480		U
53-70-3	Dibenz(a,h)anthracene	86	190		U
132-64-9	Dibenzofuran	35	480		U
91-94-1	3,3'-Dichlorobenzidine	45	480		UY
120-83-2	2,4-Dichlorophenol	27	480		U
84-66-2	Diethylphthalate	48	480		U
105-67-9	2,4-Dimethylphenol	30	1900		U
131-11-3	Dimethylphthalate	44	480		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-08

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 0509508

% Moisture: 31 decanted: (Y/N) N Date Sampled: 05/08/08 14:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 21:55

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	43	480		U
534-52-1	4,6-Dinitro-2-methylphenol	31	1900		U
51-28-5	2,4-Dinitrophenol	190	1900		U
121-14-2	2,4-Dinitrotoluene	34	480		U
606-20-2	2,6-Dinitrotoluene	54	480		U
117-84-0	Di-n-octylphthalate	38	480		U
206-44-0	Fluoranthene	76	480		U
86-73-7	Fluorene	37	480		U
118-74-1	Hexachlorobenzene	50	480		U
87-68-3	Hexachlorobutadiene	47	480		U
77-47-4	Hexachlorocyclopentadiene	88	480		UY
67-72-1	Hexachloroethane	56	480		U
193-39-5	Indeno(1,2,3-cd)pyrene	66	190		U
78-59-1	Isophorone	40	480		U
91-57-6	2-Methylnaphthalene	50	480		U
91-20-3	Naphthalene	46	480		U
95-48-7	2-Methylphenol	55	480		U
106-44-5	4-Methylphenol	38	480		U
88-74-4	2-Nitroaniline	46	1900		U
99-09-2	3-Nitroaniline	68	1900		U
100-01-6	4-Nitroaniline	140	1900		U
98-95-3	Nitrobenzene	49	480		U
88-75-5	2-Nitrophenol	32	480		U
100-02-7	4-Nitrophenol	120	1900		U
86-30-6	N-Nitrosodiphenylamine (1)	46	480		U
621-64-7	N-Nitroso-di-n-propylamine	78	480		U
87-86-5	Pentachlorophenol	48	1900		U
108-95-2	Phenol	52	480		U
129-00-0	Pyrene	57	480		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	140	480		U
95-95-4	2,4,5-Trichlorophenol	38	480		U
88-06-2	2,4,6-Trichlorophenol	50	480		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509510

% Moisture: 27 decanted: (Y/N) N Date Sampled: 05/08/08 14:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 22:22

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	36	450		U
208-96-8	Acenaphthylene	27	450		U
98-86-2	Acetophenone	56	450		U
1912-24-9	Atrazine	39	450		U
120-12-7	Anthracene	37	450		U
100-52-7	Benzaldehyde	76	450		U
56-55-3	Benzo(a)anthracene	50	180		U
205-99-2	Benzo(b)fluoranthene	43	180		U
207-08-9	Benzo(k)fluoranthene	54	450		U
191-24-2	Benzo(g,h,i)perylene	96	450		U
50-32-8	Benzo(a)pyrene	31	180		U
92-52-4	1,1'-Biphenyl	40	450		U
111-91-1	bis(2-Chloroethoxy)methane	42	450		U
111-44-4	bis(2-Chloroethyl)ether	56	450		U
108-60-1	bis(2-Chloroisopropyl)ether	70	450		U
117-81-7	Bis(2-ethylhexyl)phthalate	49	450		U
101-55-3	4-Bromophenyl-phenylether	35	450		U
85-68-7	Butylbenzylphthalate	40	450		U
105-60-2	Caprolactam	92	450		U
86-74-8	Carbazole	49	450		U
106-47-8	4-Chloroaniline	65	450		U
59-50-7	4-Chloro-3-methylphenol	38	450		U
91-58-7	2-Chloronaphthalene	44	450		U
95-57-8	2-Chlorophenol	56	450		U
7005-72-3	4-Chlorophenyl-phenylether	42	450		U
218-01-9	Chrysene	42	450		U
53-70-3	Dibenz(a,h)anthracene	82	180		U
132-64-9	Dibenzofuran	33	450		U
91-94-1	3,3'-Dichlorobenzidine	43	450		UY
120-83-2	2,4-Dichlorophenol	26	450		U
84-66-2	Diethylphthalate	46	450		U
105-67-9	2,4-Dimethylphenol	29	1800		U
131-11-3	Dimethylphthalate	42	450		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0509510

% Moisture: 27 decanted: (Y/N) N Date Sampled: 05/08/08 14:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 22:22

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	41	450		U
534-52-1	4,6-Dinitro-2-methylphenol	30	1800		U
51-28-5	2,4-Dinitrophenol	180	1800		U
121-14-2	2,4-Dinitrotoluene	33	450		U
606-20-2	2,6-Dinitrotoluene	52	450		U
117-84-0	Di-n-octylphthalate	37	450		U
206-44-0	Fluoranthene	73	450		U
86-73-7	Fluorene	36	450		U
118-74-1	Hexachlorobenzene	47	450		U
87-68-3	Hexachlorobutadiene	45	450		U
77-47-4	Hexachlorocyclopentadiene	84	450		UY
67-72-1	Hexachloroethane	54	450		U
193-39-5	Indeno(1,2,3-cd)pyrene	63	180		U
78-59-1	Isophorone	39	450		U
91-57-6	2-Methylnaphthalene	48	450		U
91-20-3	Naphthalene	44	450		U
95-48-7	2-Methylphenol	53	450		U
106-44-5	4-Methylphenol	36	450		U
88-74-4	2-Nitroaniline	44	1800		U
99-09-2	3-Nitroaniline	64	1800		U
100-01-6	4-Nitroaniline	140	1800		U
98-95-3	Nitrobenzene	47	450		U
88-75-5	2-Nitrophenol	30	450		U
100-02-7	4-Nitrophenol	110	1800		U
86-30-6	N-Nitrosodiphenylamine (1)	44	450		U
621-64-7	N-Nitroso-di-n-propylamine	75	450		U
87-86-5	Pentachlorophenol	46	1800		U
108-95-2	Phenol	49	450		U
129-00-0	Pyrene	54	450		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	140	450		U
95-95-4	2,4,5-Trichlorophenol	36	450		U
88-06-2	2,4,6-Trichlorophenol	48	450		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008 (4-5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-12

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0509512

% Moisture: 15 decanted: (Y/N) N Date Sampled: 05/08/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/10/08 01:06

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	31	390	49	J
208-96-8	Acenaphthylene	23	390	640	
98-86-2	Acetophenone	48	390		U
1912-24-9	Atrazine	33	390		U
120-12-7	Anthracene	32	390	300	J
100-52-7	Benzaldehyde	65	390		U
56-55-3	Benzo(a)anthracene	42	160	2600	
205-99-2	Benzo(b)fluoranthene	37	160	4000	
207-08-9	Benzo(k)fluoranthene	46	390	2600	
191-24-2	Benzo(g,h,i)perylene	82	390	3100	X
50-32-8	Benzo(a)pyrene	27	160	4000	
92-52-4	1,1'-Biphenyl	34	390		U
111-91-1	bis(2-Chloroethoxy)methane	36	390		U
111-44-4	bis(2-Chloroethyl)ether	48	390		U
108-60-1	bis(2-Chloroisopropyl)ether	60	390		U
117-81-7	Bis(2-ethylhexyl)phthalate	42	390		U
101-55-3	4-Bromophenyl-phenylether	30	390		U
85-68-7	Butylbenzylphthalate	35	390		U
105-60-2	Caprolactam	79	390		U
86-74-8	Carbazole	42	390		U
106-47-8	4-Chloroaniline	56	390		U
59-50-7	4-Chloro-3-methylphenol	32	390		U
91-58-7	2-Chloronaphthalene	37	390		U
95-57-8	2-Chlorophenol	48	390		U
7005-72-3	4-Chlorophenyl-phenylether	36	390		U
218-01-9	Chrysene	36	390	3000	
53-70-3	Dibenz(a,h)anthracene	70	160	1200	
132-64-9	Dibenzofuran	28	390	33	J
91-94-1	3,3'-Dichlorobenzidine	37	390		UY
120-83-2	2,4-Dichlorophenol	22	390		U
84-66-2	Diethylphthalate	40	390		U
105-67-9	2,4-Dimethylphenol	25	1600		U
131-11-3	Dimethylphthalate	36	390		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008 (4-5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-12

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0509512

% Moisture: 15 decanted: (Y/N) N Date Sampled: 05/08/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/10/08 01:06

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	36	390		U
534-52-1	4,6-Dinitro-2-methylphenol	26	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	28	390		U
606-20-2	2,6-Dinitrotoluene	44	390		U
117-84-0	Di-n-octylphthalate	31	390		U
206-44-0	Fluoranthene	62	390	4700	
86-73-7	Fluorene	30	390	140	J
118-74-1	Hexachlorobenzene	40	390		U
87-68-3	Hexachlorobutadiene	38	390		U
77-47-4	Hexachlorocyclopentadiene	72	390		UY
67-72-1	Hexachloroethane	46	390		U
193-39-5	Indeno(1,2,3-cd)pyrene	54	160	2300	
78-59-1	Isophorone	33	390		U
91-57-6	2-Methylnaphthalene	41	390		U
91-20-3	Naphthalene	38	390	46	J
95-48-7	2-Methylphenol	45	390		U
106-44-5	4-Methylphenol	31	390		U
88-74-4	2-Nitroaniline	37	1600		U
99-09-2	3-Nitroaniline	55	1600		U
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	40	390		U
88-75-5	2-Nitrophenol	26	390		U
100-02-7	4-Nitrophenol	95	1600		U
86-30-6	N-Nitrosodiphenylamine (1)	37	390		U
621-64-7	N-Nitroso-di-n-propylamine	64	390		U
87-86-5	Pentachlorophenol	39	1600		U
108-95-2	Phenol	42	390		U
129-00-0	Pyrene	46	390	5300	Y
95-94-3	1,2,4,5-Tetrachlorobenzene	120	390		U
95-95-4	2,4,5-Trichlorophenol	31	390		U
88-06-2	2,4,6-Trichlorophenol	41	390		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-01

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 0510501

% Moisture: 33 decanted: (Y/N) N Date Sampled: 05/09/08 10:46

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 22:50

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	39	490		U
208-96-8	Acenaphthylene	29	490		U
98-86-2	Acetophenone	60	490		U
1912-24-9	Atrazine	42	490		U
120-12-7	Anthracene	40	490		U
100-52-7	Benzaldehyde	82	490		U
56-55-3	Benzo(a)anthracene	54	200		U
205-99-2	Benzo(b)fluoranthene	46	200		U
207-08-9	Benzo(k)fluoranthene	58	490		U
191-24-2	Benzo(g,h,i)perylene	100	490		U
50-32-8	Benzo(a)pyrene	34	200		U
92-52-4	1,1'-Biphenyl	43	490		U
111-91-1	bis(2-Chloroethoxy)methane	46	490		U
111-44-4	bis(2-Chloroethyl)ether	60	490		U
108-60-1	bis(2-Chloroisopropyl)ether	75	490		U
117-81-7	Bis(2-ethylhexyl)phthalate	53	490		U
101-55-3	4-Bromophenyl-phenylether	38	490		U
85-68-7	Butylbenzylphthalate	44	490		U
105-60-2	Caprolactam	99	490	150	J
86-74-8	Carbazole	53	490		U
106-47-8	4-Chloroaniline	70	490		U
59-50-7	4-Chloro-3-methylphenol	41	490		U
91-58-7	2-Chloronaphthalene	47	490		U
95-57-8	2-Chlorophenol	60	490		U
7005-72-3	4-Chlorophenyl-phenylether	45	490		U
218-01-9	Chrysene	46	490		U
53-70-3	Dibenz(a,h)anthracene	88	200		U
132-64-9	Dibenzofuran	36	490		U
91-94-1	3,3'-Dichlorobenzidine	46	490		UY
120-83-2	2,4-Dichlorophenol	28	490		U
84-66-2	Diethylphthalate	50	490	120	J
105-67-9	2,4-Dimethylphenol	31	2000		U
131-11-3	Dimethylphthalate	45	490		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-01

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 0510501

% Moisture: 33 decanted: (Y/N) N Date Sampled: 05/09/08 10:46

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 22:50

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	45	490		U
534-52-1	4,6-Dinitro-2-methylphenol	32	2000		U
51-28-5	2,4-Dinitrophenol	200	2000		U
121-14-2	2,4-Dinitrotoluene	35	490		U
606-20-2	2,6-Dinitrotoluene	56	490		U
117-84-0	Di-n-octylphthalate	40	490		U
206-44-0	Fluoranthene	79	490		U
86-73-7	Fluorene	38	490		U
118-74-1	Hexachlorobenzene	51	490		U
87-68-3	Hexachlorobutadiene	48	490		U
77-47-4	Hexachlorocyclopentadiene	90	490		UY
67-72-1	Hexachloroethane	58	490		U
193-39-5	Indeno(1,2,3-cd)pyrene	68	200		U
78-59-1	Isophorone	42	490		U
91-57-6	2-Methylnaphthalene	51	490		U
91-20-3	Naphthalene	48	490		U
95-48-7	2-Methylphenol	57	490		U
106-44-5	4-Methylphenol	39	490		U
88-74-4	2-Nitroaniline	47	2000		U
99-09-2	3-Nitroaniline	70	2000		U
100-01-6	4-Nitroaniline	150	2000		U
98-95-3	Nitrobenzene	51	490		U
88-75-5	2-Nitrophenol	32	490		U
100-02-7	4-Nitrophenol	120	2000		U
86-30-6	N-Nitrosodiphenylamine (1)	47	490		U
621-64-7	N-Nitroso-di-n-propylamine	81	490		U
87-86-5	Pentachlorophenol	50	2000		U
108-95-2	Phenol	53	490		U
129-00-0	Pyrene	58	490		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	150	490		U
95-95-4	2,4,5-Trichlorophenol	39	490		U
88-06-2	2,4,6-Trichlorophenol	51	490		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-02

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0510502

% Moisture: 34 decanted: (Y/N) N Date Sampled: 05/09/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 23:17

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	40	500		U
208-96-8	Acenaphthylene	29	500		U
98-86-2	Acetophenone	62	500		U
1912-24-9	Atrazine	43	500		U
120-12-7	Anthracene	41	500		U
100-52-7	Benzaldehyde	83	500		U
56-55-3	Benzo(a)anthracene	55	200		U
205-99-2	Benzo(b)fluoranthene	47	200		U
207-08-9	Benzo(k)fluoranthene	59	500		U
191-24-2	Benzo(g,h,i)perylene	110	500		U
50-32-8	Benzo(a)pyrene	34	200		U
92-52-4	1,1'-Biphenyl	44	500		U
111-91-1	bis(2-Chloroethoxy)methane	46	500		U
111-44-4	bis(2-Chloroethyl)ether	61	500		U
108-60-1	bis(2-Chloroisopropyl)ether	77	500		U
117-81-7	Bis(2-ethylhexyl)phthalate	54	500		U
101-55-3	4-Bromophenyl-phenylether	39	500		U
85-68-7	Butylbenzylphthalate	45	500		U
105-60-2	Caprolactam	100	500	110	J
86-74-8	Carbazole	54	500		U
106-47-8	4-Chloroaniline	72	500		U
59-50-7	4-Chloro-3-methylphenol	42	500		U
91-58-7	2-Chloronaphthalene	48	500		U
95-57-8	2-Chlorophenol	61	500		U
7005-72-3	4-Chlorophenyl-phenylether	46	500		U
218-01-9	Chrysene	46	500		U
53-70-3	Dibenz(a,h)anthracene	90	200		U
132-64-9	Dibenzofuran	37	500		U
91-94-1	3,3'-Dichlorobenzidine	47	500		UY
120-83-2	2,4-Dichlorophenol	28	500		U
84-66-2	Diethylphthalate	51	500		U
105-67-9	2,4-Dimethylphenol	32	2000		U
131-11-3	Dimethylphthalate	46	500		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-02

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 0510502

% Moisture: 34 decanted: (Y/N) N Date Sampled: 05/09/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 23:17

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	46	500		U
534-52-1	4,6-Dinitro-2-methylphenol	33	2000		U
51-28-5	2,4-Dinitrophenol	200	2000		U
121-14-2	2,4-Dinitrotoluene	36	500		U
606-20-2	2,6-Dinitrotoluene	57	500		U
117-84-0	Di-n-octylphthalate	40	500		U
206-44-0	Fluoranthene	80	500		U
86-73-7	Fluorene	39	500		U
118-74-1	Hexachlorobenzene	52	500		U
87-68-3	Hexachlorobutadiene	49	500		U
77-47-4	Hexachlorocyclopentadiene	92	500		UY
67-72-1	Hexachloroethane	59	500		U
193-39-5	Indeno(1,2,3-cd)pyrene	69	200		U
78-59-1	Isophorone	43	500		U
91-57-6	2-Methylnaphthalene	52	500		U
91-20-3	Naphthalene	49	500		U
95-48-7	2-Methylphenol	58	500		U
106-44-5	4-Methylphenol	40	500		U
88-74-4	2-Nitroaniline	48	2000		U
99-09-2	3-Nitroaniline	71	2000		U
100-01-6	4-Nitroaniline	150	2000		U
98-95-3	Nitrobenzene	52	500		U
88-75-5	2-Nitrophenol	33	500		U
100-02-7	4-Nitrophenol	120	2000		U
86-30-6	N-Nitrosodiphenylamine (1)	48	500		U
621-64-7	N-Nitroso-di-n-propylamine	82	500		U
87-86-5	Pentachlorophenol	51	2000		U
108-95-2	Phenol	54	500		U
129-00-0	Pyrene	60	500		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	150	500		U
95-95-4	2,4,5-Trichlorophenol	40	500		U
88-06-2	2,4,6-Trichlorophenol	52	500		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-03

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0510503

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/09/08 13:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 23:44

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
83-32-9	Acenaphthene	32	410		U
208-96-8	Acenaphthylene	24	410		U
98-86-2	Acetophenone	50	410		U
1912-24-9	Atrazine	35	410		U
120-12-7	Anthracene	34	410		U
100-52-7	Benzaldehyde	68	410		U
56-55-3	Benzo(a)anthracene	45	160		U
205-99-2	Benzo(b)fluoranthene	39	160		U
207-08-9	Benzo(k)fluoranthene	48	410		U
191-24-2	Benzo(g,h,i)perylene	87	410		U
50-32-8	Benzo(a)pyrene	28	160		U
92-52-4	1,1'-Biphenyl	36	410		U
111-91-1	bis(2-Chloroethoxy)methane	38	410		U
111-44-4	bis(2-Chloroethyl)ether	50	410		U
108-60-1	bis(2-Chloroisopropyl)ether	63	410		U
117-81-7	Bis(2-ethylhexyl)phthalate	44	410		U
101-55-3	4-Bromophenyl-phenylether	32	410		U
85-68-7	Butylbenzylphthalate	36	410		U
105-60-2	Caprolactam	83	410		U
86-74-8	Carbazole	44	410		U
106-47-8	4-Chloroaniline	59	410		U
59-50-7	4-Chloro-3-methylphenol	34	410		U
91-58-7	2-Chloronaphthalene	39	410		U
95-57-8	2-Chlorophenol	50	410		U
7005-72-3	4-Chlorophenyl-phenylether	38	410		U
218-01-9	Chrysene	38	410		U
53-70-3	Dibenz(a,h)anthracene	74	160		U
132-64-9	Dibenzofuran	30	410		U
91-94-1	3,3'-Dichlorobenzidine	39	410		UY
120-83-2	2,4-Dichlorophenol	23	410		U
84-66-2	Diethylphthalate	42	410	94	J
105-67-9	2,4-Dimethylphenol	26	1600		U
131-11-3	Dimethylphthalate	38	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-03

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0510503

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/09/08 13:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 23:44

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	37	410		U
534-52-1	4,6-Dinitro-2-methylphenol	27	1600		U
51-28-5	2,4-Dinitrophenol	160	1600		U
121-14-2	2,4-Dinitrotoluene	30	410		U
606-20-2	2,6-Dinitrotoluene	47	410		U
117-84-0	Di-n-octylphthalate	33	410		U
206-44-0	Fluoranthene	66	410		U
86-73-7	Fluorene	32	410		U
118-74-1	Hexachlorobenzene	43	410		U
87-68-3	Hexachlorobutadiene	40	410		U
77-47-4	Hexachlorocyclopentadiene	75	410		UY
67-72-1	Hexachloroethane	48	410		U
193-39-5	Indeno(1,2,3-cd)pyrene	57	160		U
78-59-1	Isophorone	35	410		U
91-57-6	2-Methylnaphthalene	43	410		U
91-20-3	Naphthalene	40	410		U
95-48-7	2-Methylphenol	48	410		U
106-44-5	4-Methylphenol	33	410		U
88-74-4	2-Nitroaniline	40	1600		U
99-09-2	3-Nitroaniline	58	1600		U
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	43	410		U
88-75-5	2-Nitrophenol	27	410		U
100-02-7	4-Nitrophenol	100	1600		U
86-30-6	N-Nitrosodiphenylamine (1)	39	410		U
621-64-7	N-Nitroso-di-n-propylamine	68	410		U
87-86-5	Pentachlorophenol	42	1600		U
108-95-2	Phenol	44	410		U
129-00-0	Pyrene	49	410		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	120	410		U
95-95-4	2,4,5-Trichlorophenol	33	410		U
88-06-2	2,4,6-Trichlorophenol	43	410		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0510504

% Moisture: 10 decanted: (Y/N) N Date Sampled: 05/09/08 13:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/10/08 00:11

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	29	370		U
208-96-8	Acenaphthylene	22	370		U
98-86-2	Acetophenone	45	370		U
1912-24-9	Atrazine	31	370		U
120-12-7	Anthracene	30	370		U
100-52-7	Benzaldehyde	61	370		U
56-55-3	Benzo(a)anthracene	40	150		U
205-99-2	Benzo(b)fluoranthene	35	150		U
207-08-9	Benzo(k)fluoranthene	43	370		U
191-24-2	Benzo(g,h,i)perylene	78	370		U
50-32-8	Benzo(a)pyrene	25	150		U
92-52-4	1,1'-Biphenyl	32	370		U
111-91-1	bis(2-Chloroethoxy)methane	34	370		U
111-44-4	bis(2-Chloroethyl)ether	45	370		U
108-60-1	bis(2-Chloroisopropyl)ether	57	370		U
117-81-7	Bis(2-ethylhexyl)phthalate	40	370		U
101-55-3	4-Bromophenyl-phenylether	28	370		U
85-68-7	Butylbenzylphthalate	33	370		U
105-60-2	Caprolactam	74	370		U
86-74-8	Carbazole	40	370		U
106-47-8	4-Chloroaniline	53	370		U
59-50-7	4-Chloro-3-methylphenol	31	370		U
91-58-7	2-Chloronaphthalene	35	370		U
95-57-8	2-Chlorophenol	45	370		U
7005-72-3	4-Chlorophenyl-phenylether	34	370		U
218-01-9	Chrysene	34	370		U
53-70-3	Dibenz(a,h)anthracene	66	150		U
132-64-9	Dibenzofuran	27	370		U
91-94-1	3,3'-Dichlorobenzidine	35	370		UY
120-83-2	2,4-Dichlorophenol	21	370		U
84-66-2	Diethylphthalate	37	370	54	J
105-67-9	2,4-Dimethylphenol	24	1500		U
131-11-3	Dimethylphthalate	34	370		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0510504

% Moisture: 10 decanted: (Y/N) N Date Sampled: 05/09/08 13:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/10/08 00:11

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	34	370		U
534-52-1	4,6-Dinitro-2-methylphenol	24	1500		U
51-28-5	2,4-Dinitrophenol	150	1500		U
121-14-2	2,4-Dinitrotoluene	26	370		U
606-20-2	2,6-Dinitrotoluene	42	370		U
117-84-0	Di-n-octylphthalate	30	370		U
206-44-0	Fluoranthene	59	370		U
86-73-7	Fluorene	29	370		U
118-74-1	Hexachlorobenzene	38	370		U
87-68-3	Hexachlorobutadiene	36	370		U
77-47-4	Hexachlorocyclopentadiene	68	370		UY
67-72-1	Hexachloroethane	43	370		U
193-39-5	Indeno(1,2,3-cd)pyrene	51	150		U
78-59-1	Isophorone	31	370		U
91-57-6	2-Methylnaphthalene	38	370		U
91-20-3	Naphthalene	36	370		U
95-48-7	2-Methylphenol	43	370		U
106-44-5	4-Methylphenol	29	370		U
88-74-4	2-Nitroaniline	35	1500		U
99-09-2	3-Nitroaniline	52	1500		U
100-01-6	4-Nitroaniline	110	1500		U
98-95-3	Nitrobenzene	38	370		U
88-75-5	2-Nitrophenol	24	370		U
100-02-7	4-Nitrophenol	89	1500		U
86-30-6	N-Nitrosodiphenylamine (1)	35	370		U
621-64-7	N-Nitroso-di-n-propylamine	61	370		U
87-86-5	Pentachlorophenol	37	1500		U
108-95-2	Phenol	40	370		U
129-00-0	Pyrene	44	370		UY
95-94-3	1,2,4,5-Tetrachlorobenzene	110	370		U
95-95-4	2,4,5-Trichlorophenol	30	370		U
88-06-2	2,4,6-Trichlorophenol	38	370		U

(1) - Cannot be separated from Diphenylamine

FORM 2
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Level: (low/med) LOW

	CLIENT SAMPLE NO.	S1 (2FP) #	S2 (PHL) #	S3 (NBZ) #	S4 (FBP) #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	SBLK0520BS2	74	79	66	76	76	79			0
02	SBLK0520BS2L	74	75	66	77	83	82			0
03	1549SB001(7-	65	69	56	67	76	70			0
04	1549SB004(5-	68	73	60	74	75	74			0
05	1549SB006(5-	67	72	59	72	78	78			0
06	1034SB004 (5	60	63	52	62	69	68			0
07	1041SB002 (7	53	58	42	51	60	63			0
08	1041SB004 (7	53	55	46	55	62	62			0
09	1034SB001 (7	55	57	45	56	62	63			0
10	1041SB003 (7	55	57	46	54	68	74			0
11	1041SB001 (7	57	59	47	57	65	68			0
12	1034SB006 (7	55	58	46	58	69	69			0
13	1034SB007 (7	60	62	51	62	75	80			0
14	1549SB003(5-	69	73	60	73	78	79			0
15	1034SB008 (4	62	66	56	67	64	76			0
16	1034SB007 (7	71	73	61	74	73	80			0
17	1034SB007 (7	71	74	62	73	73	84			0
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

	EL QC LIMITS	SPIKE CONC (UG/KG)
S1 (2FP) = 2-Fluorophenol	(35-105)	6700
S2 (PHL) = Phenol-d6	(40-100)	6700
S3 (NBZ) = Nitrobenzene-d5	(35-100)	3300
S4 (FBP) = 2-Fluorobiphenyl	(45-105)	3300
S5 (TBP) = 2,4,6-Tribromophenol	(35-125)	6700
S6 (TPH) = Terphenyl-d14	(30-125)	3300

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: SBLK0520BS2 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
Acenaphthene	3333	0.0000	2952	88	45-110
Acenaphthylene	3333	0.0000	2852	86	45-105
Acetophenone	3333	0.0000	1872	56	35-110
Atrazine	3333	0.0000	2297	69	55-105
Anthracene	3333	0.0000	2943	88	55-105
Benzaldehyde	3333	0.0000	142.1	4*	10-160
Benzo(a)anthracene	3333	0.0000	2892	87	50-110
Benzo(b)fluoranthene	3333	0.0000	2723	82	45-115
Benzo(k)fluoranthene	3333	0.0000	2584	78	45-125
Benzo(g,h,i)perylene	3333	0.0000	3569	107	40-125
Benzo(a)pyrene	3333	0.0000	2925	88	50-110
1,1'-Biphenyl	3333	0.0000	2640	79	45-110
bis(2-Chloroethoxy)meth	3333	0.0000	2492	75	45-110
bis(2-Chloroethyl)ether	3333	0.0000	2417	72	40-105
bis(2-Chloroisopropyl)e	3333	0.0000	2388	72	20-115
Bis(2-ethylhexyl)phthal	3333	0.0000	3049	91	45-125
4-Bromophenyl-phenyleth	3333	0.0000	2282	68	45-115
Butylbenzylphthalate	3333	0.0000	3048	91	50-125
Caprolactam	3333	0.0000	3688	111*	50-110
Carbazole	3333	0.0000	3172	95	45-115
4-Chloroaniline	3333	0.0000	1960	59	10- 95
4-Chloro-3-methylphenol	3333	0.0000	3031	91	45-115
2-Chloronaphthalene	3333	0.0000	2598	78	45-105
2-Chlorophenol	3333	0.0000	2651	80	45-105
4-Chlorophenyl-phenylet	3333	0.0000	2695	81	45-110
Chrysene	3333	0.0000	3058	92	55-110
Dibenz(a,h)anthracene	3333	0.0000	3267	98	40-125
Dibenzofuran	3333	0.0000	2716	81	50-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: SBLK0520BS2 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	3333	0.0000	2444	73	19-130
2,4-Dichlorophenol	3333	0.0000	2609	78	45-110
Diethylphthalate	3333	0.0000	3166	95	50-115
2,4-Dimethylphenol	3333	0.0000	2799	84	30-105
Dimethylphthalate	3333	0.0000	2826	85	50-110
Di-n-butylphthalate	3333	52.43	3172	94	55-110
4,6-Dinitro-2-methylphe	3333	0.0000	3791	114	30-135
2,4-Dinitrophenol	3333	0.0000	4990	150*	15-130
2,4-Dinitrotoluene	3333	0.0000	3181	95	50-115
2,6-Dinitrotoluene	3333	0.0000	2895	87	50-110
Di-n-octylphthalate	3333	0.0000	2634	79	40-130
Fluoranthene	3333	0.0000	2945	88	55-115
Fluorene	3333	0.0000	2756	83	50-110
Hexachlorobenzene	3333	0.0000	2720	82	45-120
Hexachlorobutadiene	3333	0.0000	2081	62	30-110
Hexachlorocyclopentadie	3333	0.0000	1358	41	10-110
Hexachloroethane	3333	0.0000	2057	62	35-110
Indeno(1,2,3-cd)pyrene	3333	0.0000	3257	98	40-120
Isophorone	3333	0.0000	2496	75	45-110
2-Methylnaphthalene	3333	0.0000	2458	74	40-110
Naphthalene	3333	0.0000	2443	73	40-105
2-Methylphenol	3333	0.0000	2815	84	40-105
4-Methylphenol	3333	0.0000	2944	88	40-105
2-Nitroaniline	3333	0.0000	2768	83	45-120
3-Nitroaniline	3333	0.0000	2993	90	25-110
4-Nitroaniline	3333	0.0000	4328	130*	35-115
Nitrobenzene	3333	0.0000	2116	63	40-115
2-Nitrophenol	3333	0.0000	2751	82	40-110

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: SBLK0520BS2 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
4-Nitrophenol	3333	0.0000	2827	85	15-140
N-Nitrosodiphenylamine	3333	0.0000	2824	85	50-115
N-Nitroso-di-n-prop.(1)	3333	0.0000	2465	74	40-115
Pentachlorophenol	3333	0.0000	3274	98	25-120
Phenol	3333	0.0000	2660	80	40-100
Pyrene	3333	0.0000	2631	79	45-125
1,2,4,5-Tetrachlorobenz	3333	0.0000	1904	57	50-150
2,4,5-Trichlorophenol	3333	0.0000	2897	87	50-110
2,4,6-Trichlorophenol	3333	0.0000	2814	84	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 4 out of 65 outside limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
Acenaphthene	3659	0.0000	3095	84	45-110
Acenaphthylene	3659	0.0000	3003	82	45-105
Acetophenone	3659	0.0000	2062	56	35-110
Atrazine	3659	0.0000	2405	66	55-105
Anthracene	3659	0.0000	2961	81	55-105
Benzaldehyde	3659	0.0000	142.0	4*	10-160
Benzo(a)anthracene	3659	0.0000	2958	81	50-110
Benzo(b)fluoranthene	3659	0.0000	2837	78	45-115
Benzo(k)fluoranthene	3659	0.0000	2918	80	45-125
Benzo(g,h,i)perylene	3659	0.0000	2805	77	40-125
Benzo(a)pyrene	3659	0.0000	2881	79	50-110
1,1'-Biphenyl	3659	0.0000	2778	76	45-110
bis(2-Chloroethoxy)meth	3659	0.0000	2611	71	45-110
bis(2-Chloroethyl)ether	3659	0.0000	2522	69	40-105
bis(2-Chloroisopropyl)e	3659	0.0000	2533	69	20-115
Bis(2-ethylhexyl)phthal	3659	0.0000	3456	94	45-125
4-Bromophenyl-phenyleth	3659	0.0000	2327	64	45-115
Butylbenzylphthalate	3659	0.0000	3402	93	50-125
Caprolactam	3659	0.0000	3368	92	50-110
Carbazole	3659	0.0000	3147	86	45-115
4-Chloroaniline	3659	0.0000	2474	68	10- 95
4-Chloro-3-methylphenol	3659	0.0000	3092	84	45-115
2-Chloronaphthalene	3659	0.0000	2740	75	45-105
2-Chlorophenol	3659	0.0000	2824	77	45-105
4-Chlorophenyl-phenylet	3659	0.0000	2757	75	45-110
Chrysene	3659	0.0000	3025	83	55-110
Dibenz(a,h)anthracene	3659	0.0000	2751	75	40-125
Dibenzofuran	3659	0.0000	2839	78	50-105

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
3,3'-Dichlorobenzidine	3659	0.0000	1971	54	19-130
2,4-Dichlorophenol	3659	0.0000	2703	74	45-110
Diethylphthalate	3659	54.48	3255	87	50-115
2,4-Dimethylphenol	3659	0.0000	2578	70	30-105
Dimethylphthalate	3659	0.0000	2884	79	50-110
Di-n-butylphthalate	3659	0.0000	3233	88	55-110
4,6-Dinitro-2-methylphe	3659	0.0000	2431	66	30-135
2,4-Dinitrophenol	3659	0.0000	2078	57	15-130
2,4-Dinitrotoluene	3659	0.0000	3117	85	50-115
2,6-Dinitrotoluene	3659	0.0000	2912	80	50-110
Di-n-octylphthalate	3659	0.0000	3636	99	40-130
Fluoranthene	3659	0.0000	2900	79	55-115
Fluorene	3659	0.0000	2841	78	50-110
Hexachlorobenzene	3659	0.0000	2743	75	45-120
Hexachlorobutadiene	3659	0.0000	2115	58	30-110
Hexachlorocyclopentadie	3659	0.0000	1233	34	10-110
Hexachloroethane	3659	0.0000	2192	60	35-110
Indeno(1,2,3-cd)pyrene	3659	0.0000	2723	74	40-120
Isophorone	3659	0.0000	2612	71	45-110
2-Methylnaphthalene	3659	0.0000	2639	72	40-110
Naphthalene	3659	0.0000	2550	70	40-105
2-Methylphenol	3659	0.0000	3008	82	40-105
4-Methylphenol	3659	0.0000	3077	84	40-105
2-Nitroaniline	3659	0.0000	2751	75	45-120
3-Nitroaniline	3659	0.0000	3308	90	25-110
4-Nitroaniline	3659	0.0000	4368	119*	35-115
Nitrobenzene	3659	0.0000	2174	59	40-115
2-Nitrophenol	3659	0.0000	2862	78	40-110

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
4-Nitrophenol	3659	0.0000	2412	66	15-140
N-Nitrosodiphenylamine	3659	0.0000	2825	77	50-115
N-Nitroso-di-n-prop.(1)	3659	0.0000	2572	70	40-115
Pentachlorophenol	3659	0.0000	2484	68	25-120
Phenol	3659	0.0000	2834	77	40-100
Pyrene	3659	0.0000	2836	78	45-125
1,2,4,5-Tetrachlorobenz	3659	0.0000	2010	55	50-150
2,4,5-Trichlorophenol	3659	0.0000	2838	78	50-110
2,4,6-Trichlorophenol	3659	0.0000	2774	76	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acenaphthene	3659	3027	83	2	30	45-110
Acenaphthylene	3659	2961	81	1	30	45-105
Acetophenone	3659	2091	57	1	30	35-110
Atrazine	3659	2399	66	0	30	55-105
Anthracene	3659	2955	81	0	30	55-105
Benzaldehyde	3659	140.0	4*	1	30	10-160
Benzo(a)anthracene	3659	2953	81	0	30	50-110
Benzo(b)fluoranthene	3659	3104	85	9	30	45-115
Benzo(k)fluoranthene	3659	2910	80	0	30	45-125
Benzo(g,h,i)perylene	3659	2474	68	12	30	40-125
Benzo(a)pyrene	3659	2916	80	1	30	50-110
1,1'-Biphenyl	3659	2759	75	1	30	45-110
bis(2-Chloroethoxy)meth	3659	2628	72	1	30	45-110
bis(2-Chloroethyl)ether	3659	2549	70	1	30	40-105
bis(2-Chloroisopropyl)e	3659	2518	69	0	30	20-115
Bis(2-ethylhexyl)phthal	3659	3494	95	1	30	45-125
4-Bromophenyl-phenyleth	3659	2358	64	1	30	45-115
Butylbenzylphthalate	3659	3514	96	3	30	50-125
Caprolactam	3659	3279	90	3	30	50-110
Carbazole	3659	3211	88	2	30	45-115
4-Chloroaniline	3659	2541	69	3	30	10- 95
4-Chloro-3-methylphenol	3659	3077	84	0	30	45-115
2-Chloronaphthalene	3659	2721	74	1	30	45-105
2-Chlorophenol	3659	2861	78	1	30	45-105
4-Chlorophenyl-phenylet	3659	2709	74	2	30	45-110
Chrysene	3659	3023	83	0	30	55-110
Dibenz(a,h)anthracene	3659	2535	69	8	30	40-125
Dibenzofuran	3659	2771	76	2	30	50-105

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
3,3'-Dichlorobenzidine	3659	1959	54	1	30	19-130
2,4-Dichlorophenol	3659	2757	75	2	30	45-110
Diethylphthalate	3659	3142	84	4	30	50-115
2,4-Dimethylphenol	3659	2536	69	2	30	30-105
Dimethylphthalate	3659	2838	78	2	30	50-110
Di-n-butylphthalate	3659	3156	86	2	30	55-110
4,6-Dinitro-2-methylphe	3659	2581	70	6	30	30-135
2,4-Dinitrophenol	3659	1921	52	8	30	15-130
2,4-Dinitrotoluene	3659	3062	84	2	30	50-115
2,6-Dinitrotoluene	3659	2866	78	2	30	50-110
Di-n-octylphthalate	3659	4012	110	10	30	40-130
Fluoranthene	3659	2824	77	3	30	55-115
Fluorene	3659	2764	76	3	30	50-110
Hexachlorobenzene	3659	2733	75	0	30	45-120
Hexachlorobutadiene	3659	2140	58	1	30	30-110
Hexachlorocyclopentadie	3659	1321	36	7	30	10-110
Hexachloroethane	3659	2226	61	2	30	35-110
Indeno(1,2,3-cd)pyrene	3659	2459	67	10	30	40-120
Isophorone	3659	2609	71	0	30	45-110
2-Methylnaphthalene	3659	2651	72	0	30	40-110
Naphthalene	3659	2588	71	1	30	40-105
2-Methylphenol	3659	3032	83	1	30	40-105
4-Methylphenol	3659	3070	84	0	30	40-105
2-Nitroaniline	3659	2736	75	0	30	45-120
3-Nitroaniline	3659	3339	91	1	30	25-110
4-Nitroaniline	3659	4495	123*	3	30	35-115
Nitrobenzene	3659	2183	60	0	30	40-115
2-Nitrophenol	3659	2900	79	1	30	40-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
4-Nitrophenol	3659	2393	65	1	30	15-140
N-Nitrosodiphenylamine	3659	2880	79	2	30	50-115
N-Nitroso-di-n-prop.(1)	3659	2616	71	2	30	40-115
Pentachlorophenol	3659	2419	66	3	30	25-120
Phenol	3659	2898	79	2	30	40-100
Pyrene	3659	2956	81	4	30	45-125
1,2,4,5-Tetrachlorobenz	3659	2019	55	0	30	50-150
2,4,5-Trichlorophenol	3659	2879	79	1	30	50-110
2,4,6-Trichlorophenol	3659	2704	74	2	30	45-110

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 65 outside limits
Spike Recovery: 4 out of 130 outside limits

COMMENTS: _____

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0520BS2

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Lab File ID: S2BS0520 Lab Sample ID: SBLK0520BS2

Instrument ID: BNA3 Date Extracted: 05/20/08

Matrix: (soil/water) SOIL Date Analyzed: 06/09/08

Level: (low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1843

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0520BS2L	SBLK0520BS2LCS	S2LS0520	06/09/08
02	1549SB001(7-	0805074-06	0507406	06/09/08
03	1549SB004(5-	0805074-09	0507409	06/09/08
04	1549SB006(5-	0805074-11	0507411	06/09/08
05	1034SB004 (5	0805095-02	0509502	06/09/08
06	1041SB002 (7	0805095-04	0509504	06/09/08
07	1041SB004 (7	0805095-08	0509508	06/09/08
08	1034SB001 (7	0805095-10	0509510	06/09/08
09	1041SB003 (7	0805105-01	0510501	06/09/08
10	1041SB001 (7	0805105-02	0510502	06/09/08
11	1034SB006 (7	0805105-03	0510503	06/09/08
12	1034SB007 (7	0805105-04	0510504	06/10/08
13	1549SB003(5-	0805074-12	0507412	06/10/08
14	1034SB008 (4	0805095-12	0509512	06/10/08
15	1034SB007 (7	0805105-04	0510504M	06/10/08
16	1034SB007 (7	0805105-04	0510504S	06/10/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0520BS2

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0520BS2

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S2BS0520

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 18:43

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
83-32-9	Acenaphthene	26	330		U
208-96-8	Acenaphthylene	20	330		U
98-86-2	Acetophenone	41	330		U
1912-24-9	Atrazine	28	330		U
120-12-7	Anthracene	27	330		U
100-52-7	Benzaldehyde	55	330		U
56-55-3	Benzo(a)anthracene	36	130		U
205-99-2	Benzo(b)fluoranthene	32	130		U
207-08-9	Benzo(k)fluoranthene	39	330		U
191-24-2	Benzo(g,h,i)perylene	70	330		U
50-32-8	Benzo(a)pyrene	23	130		U
92-52-4	1,1'-Biphenyl	29	330		U
111-91-1	bis(2-Chloroethoxy)methane	31	330		U
111-44-4	bis(2-Chloroethyl)ether	41	330		U
108-60-1	bis(2-Chloroisopropyl)ether	51	330		U
117-81-7	Bis(2-ethylhexyl)phthalate	36	330		U
101-55-3	4-Bromophenyl-phenylether	26	330		U
85-68-7	Butylbenzylphthalate	30	330		U
105-60-2	Caprolactam	67	330		U
86-74-8	Carbazole	36	330		U
106-47-8	4-Chloroaniline	48	330		U
59-50-7	4-Chloro-3-methylphenol	28	330		U
91-58-7	2-Chloronaphthalene	32	330		U
95-57-8	2-Chlorophenol	41	330		U
7005-72-3	4-Chlorophenyl-phenylether	31	330		U
218-01-9	Chrysene	31	330		U
53-70-3	Dibenz(a,h)anthracene	60	130		U
132-64-9	Dibenzofuran	24	330		U
91-94-1	3,3'-Dichlorobenzidine	31	330		U
120-83-2	2,4-Dichlorophenol	19	330		U
84-66-2	Diethylphthalate	34	330		U
105-67-9	2,4-Dimethylphenol	21	1300		U
131-11-3	Dimethylphthalate	30	330		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0520BS2

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0520BS2

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S2BS0520

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/09/08 18:43

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	30	330	52	J
534-52-1	4,6-Dinitro-2-methylphenol	22	1300		U
51-28-5	2,4-Dinitrophenol	130	1300		U
121-14-2	2,4-Dinitrotoluene	24	330		U
606-20-2	2,6-Dinitrotoluene	38	330		U
117-84-0	Di-n-octylphthalate	27	330		U
206-44-0	Fluoranthene	54	330		U
86-73-7	Fluorene	26	330		U
118-74-1	Hexachlorobenzene	35	330		U
87-68-3	Hexachlorobutadiene	33	330		U
77-47-4	Hexachlorocyclopentadiene	61	330		U
67-72-1	Hexachloroethane	39	330		U
193-39-5	Indeno(1,2,3-cd)pyrene	46	130		U
78-59-1	Isophorone	28	330		U
91-57-6	2-Methylnaphthalene	35	330		U
91-20-3	Naphthalene	32	330		U
95-48-7	2-Methylphenol	39	330		U
106-44-5	4-Methylphenol	26	330		U
88-74-4	2-Nitroaniline	32	1300		U
99-09-2	3-Nitroaniline	47	1300		U
100-01-6	4-Nitroaniline	100	1300		U
98-95-3	Nitrobenzene	34	330		U
88-75-5	2-Nitrophenol	22	330		U
100-02-7	4-Nitrophenol	81	1300		U
86-30-6	N-Nitrosodiphenylamine (1)	32	330		U
621-64-7	N-Nitroso-di-n-propylamine	55	330		U
87-86-5	Pentachlorophenol	34	1300		U
108-95-2	Phenol	36	330		U
129-00-0	Pyrene	40	330		U
95-94-3	1,2,4,5-Tetrachlorobenzene	100	330		U
95-95-4	2,4,5-Trichlorophenol	27	330		U
88-06-2	2,4,6-Trichlorophenol	35	330		U

(1) - Cannot be separated from Diphenylamine

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA96567

Lab File ID: DF0516B1 DFTPP Injection Date: 05/16/07

Instrument ID: BNA3 DFTPP Injection Time: 1155

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	45.0
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	47.6
70	Less than 2.0% of mass 69	0.2 (0.3)1
127	40.0 - 60.0% of mass 198	50.9
197	Less than 1.0% of mass 198	0.3
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.0
275	10.0 - 30.0% of mass 198	27.2
365	Greater than 1.0% of mass 198	3.21
441	Present, but less than mass 443	10.4
442	Greater than 40.0% of mass 198	65.8
443	17.0 - 23.0% of mass 442	12.0 (18.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACAL100PPM	BNACAL100PPM	CAL100	05/16/07	1218
02	BNACAL90PPM	BNACAL90PPM	CAL090	05/16/07	1247
03	BNACAL80PPM	BNACAL80PPM	CAL080	05/16/07	1317
04	BNACAL60PPM	BNACAL60PPM	CAL060	05/16/07	1417
05	BNACAL50PPM	BNACAL50PPM	CAL050	05/16/07	1447
06	BNACAL40PPM	BNACAL40PPM	CAL040	05/16/07	1517
07	BNACAL30PPM	BNACAL30PPM	CAL030	05/16/07	1546
08	BNACAL20PPM	BNACAL20PPM	CAL020	05/16/07	1616
09	BNACAL10PPM	BNACAL10PPM	CAL010	05/16/07	1645
10	BNACAL5PPM	BNACAL5PPM	CAL005	05/16/07	1715
11	BNACAL2PPM	BNACAL2PPM	CAL002	05/16/07	1744
12	BNACAL1PPM	BNACAL1PPM	CAL001	05/16/07	1813
13		BNACAL2PPM	CALB002	05/16/07	1843
14		BNACAL5PPM	CALB005	05/16/07	1912
15		BNACAL10PPM	CALB010	05/16/07	1941
16		BNACAL20PPM	CALB020	05/16/07	2011
17		BNACAL30PPM	CALB030	05/16/07	2039
18		BNACAL30PPM	CALB040	05/16/07	2108
19		BNACAL50PPM	CALB050	05/16/07	2137
20		BNACAL60PPM	CALB060	05/16/07	2206
21		BNACAL70PPM	CALB070	05/16/07	2235
22					

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA96567

Lab File ID: DF0516B2 DFTPP Injection Date: 05/16/07

Instrument ID: BNA3 DFTPP Injection Time: 2256

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	46.3
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	49.2
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	40.0 - 60.0% of mass 198	52.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.1
275	10.0 - 30.0% of mass 198	25.8
365	Greater than 1.0% of mass 198	2.99
441	Present, but less than mass 443	8.7
442	Greater than 40.0% of mass 198	55.3
443	17.0 - 23.0% of mass 442	10.3 (18.6)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		BNACAL80PPM	CALB080	05/16/07	2319
02		BNACAL90PPM	CALB090	05/16/07	2348
03		BNACAL100PPM	CALB100	05/17/07	0017
04		BNACAL002PPM	CALA002	05/17/07	0046
05		BNACAL005PPM	CALA005	05/17/07	0114
06		BNACAL010PPM	CALA010	05/17/07	0143
07		BNACAL020PPM	CALA020	05/17/07	0212
08		BNACAL030PPM	CALA030	05/17/07	0240
09		BNACAL050PPM	CALA050	05/17/07	0309
10		BNACAL070PPM	CALA070	05/17/07	0337
11		BNACAL100PPM	CALA100	05/17/07	0406
12		BNAICV-050PPM	ICV03	05/17/07	0601
13					
14					
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Lab File ID: DF0609B1 DFTPP Injection Date: 06/09/08

Instrument ID: BNA3 DFTPP Injection Time: 1410

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	45.4
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	51.2
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	40.0 - 60.0% of mass 198	57.2
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.1
275	10.0 - 30.0% of mass 198	25.7
365	Greater than 1.0% of mass 198	3.09
441	Present, but less than mass 443	8.4
442	Greater than 40.0% of mass 198	54.6
443	17.0 - 23.0% of mass 442	10.5 (19.3)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	BNACCV50PPM	BNACCV50PPM	CCV050S	06/09/08	1432
02	SBLK0520BS2	SBLK0520BS2	S2BS0520	06/09/08	1843
03	SBLK0520BS2L	SBLK0520BS2LCS	S2LS0520	06/09/08	1910
04	1549SB001(7-	0805074-06	0507406	06/09/08	1938
05	1549SB004(5-	0805074-09	0507409	06/09/08	2005
06	1549SB006(5-	0805074-11	0507411	06/09/08	2033
07	1034SB004 (5	0805095-02	0509502	06/09/08	2100
08	1041SB002 (7	0805095-04	0509504	06/09/08	2127
09	1041SB004 (7	0805095-08	0509508	06/09/08	2155
10	1034SB001 (7	0805095-10	0509510	06/09/08	2222
11	1041SB003 (7	0805105-01	0510501	06/09/08	2250
12	1041SB001 (7	0805105-02	0510502	06/09/08	2317
13	1034SB006 (7	0805105-03	0510503	06/09/08	2344
14	1034SB007 (7	0805105-04	0510504	06/10/08	0011
15	1549SB003(5-	0805074-12	0507412	06/10/08	0039
16	1034SB008 (4	0805095-12	0509512	06/10/08	0106
17	1034SB007 (7	0805105-04	0510504M	06/10/08	0150
18	1034SB007 (7	0805105-04	0510504S	06/10/08	0218
19					
20					
21					
22					

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Lab File ID (Standard): CCV050S Date Analyzed: 06/09/08

Instrument ID: BNA3 Time Analyzed: 1432

		IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
	12 HOUR STD	650971	3.54	2442421	4.83	1247671	6.74
	UPPER LIMIT	1301942	4.04	4884842	5.33	2495342	7.24
	LOWER LIMIT	325486	3.04	1221211	4.33	623836	6.24
	CLIENT SAMPLE NO.						
01	SBLK0520BS2	802506	3.54	2974290	4.83	1579404	6.74
02	SBLK0520BS2L	755828	3.55	2782523	4.83	1440408	6.74
03	1549SB001(7-	737092	3.54	2727002	4.83	1398733	6.74
04	1549SB004(5-	796057	3.54	2926175	4.83	1493838	6.74
05	1549SB006(5-	832280	3.54	3002786	4.83	1516190	6.74
06	1034SB004 (5	819485	3.54	3045419	4.83	1590959	6.74
07	1041SB002 (7	776201	3.54	2877553	4.83	1548867	6.74
08	1041SB004 (7	893105	3.54	3283824	4.83	1742092	6.74
09	1034SB001 (7	723719	3.54	2715323	4.83	1424956	6.74
10	1041SB003 (7	828032	3.54	3044862	4.83	1545904	6.74
11	1041SB001 (7	653480	3.54	2490981	4.83	1280051	6.74
12	1034SB006 (7	803753	3.54	3018552	4.83	1575207	6.74
13	1034SB007 (7	763457	3.54	2815442	4.83	1400195	6.74
14	1549SB003(5-	795308	3.54	2991543	4.83	1541750	6.74
15	1034SB008 (4	724787	3.54	2669269	4.83	1408160	6.73
16	1034SB007 (7	690163	3.54	2617943	4.83	1378427	6.74
17	1034SB007 (7	729425	3.54	2774226	4.83	1484327	6.74
18							
19							
20							
21							
22							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: RADFORD003

Lab File ID (Standard): CCV050S Date Analyzed: 06/09/08

Instrument ID: BNA3 Time Analyzed: 1432

		IS4(PHN) AREA	#	RT	#	IS5(CRY) AREA	#	RT	#	IS6(PRY) AREA	#	RT	#
	12 HOUR STD	1978373		8.34		2048713		11.17		1710508		12.49	
	UPPER LIMIT	3956746		8.84		4097426		11.67		3421016		12.99	
	LOWER LIMIT	989187		7.84		1024357		10.67		855254		11.99	
	CLIENT SAMPLE NO.												
01	SBLK0520BS2	2552546		8.34		2475873		11.17		2403552		12.50	
02	SBLK0520BS2L	2278434		8.35		2054993		11.17		1921123		12.50	
03	1549SB001(7-	2153660		8.34		2138900		11.17		2127051		12.50	
04	1549SB004(5-	2323510		8.34		2198375		11.18		1820971		12.50	
05	1549SB006(5-	2305010		8.34		1998792		11.17		1624122		12.49	
06	1034SB004 (5	2483101		8.34		2327653		11.17		2068288		12.49	
07	1041SB002 (7	2416522		8.34		2276720		11.17		2019985		12.50	
08	1041SB004 (7	2722812		8.34		2498963		11.17		2236097		12.49	
09	1034SB001 (7	2267223		8.34		2125640		11.17		1873852		12.49	
10	1041SB003 (7	2308137		8.34		1896976		11.17		1656982		12.49	
11	1041SB001 (7	1986015		8.34		1868733		11.17		1654214		12.49	
12	1034SB006 (7	2463820		8.34		2373181		11.17		2145160		12.49	
13	1034SB007 (7	2127203		8.34		1949331		11.17		1762850		12.49	
14	1549SB003(5-	2451085		8.34		2172169		11.17		1599399		12.49	
15	1034SB008 (4	2170317		8.34		1699812		11.18		1155692		12.50	
16	1034SB007 (7	2167342		8.35		1752365		11.17		1219594		12.50	
17	1034SB007 (7	2249105		8.35		1687570		11.17		1031071		12.50	
18													
19													
20													
21													
22													

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag internal standard area values with an asterisk.
* Values outside of QC limits.

PCB Section

ORGANIC CASE NARRATIVE - PCBs
Arcadis – Radford003

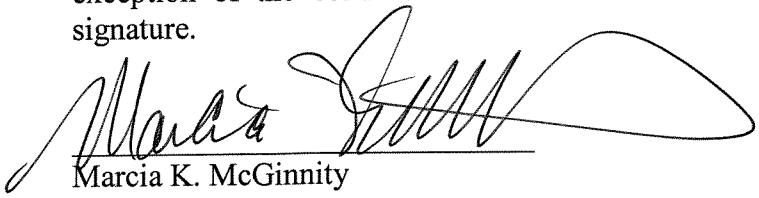
Date Sampled	Date Received	Lab ID	Client ID
05/07/08	05/08/08	0805074-06	1549SB001(7-8)
05/07/08	05/08/08	0805074-09	1549SB004(5-6)
05/07/08	05/08/08	0805074-11	1549SB006(5-6)
05/07/08	05/08/08	0805074-12	1549SB003(5-6)
05/08/08	05/09/08	0805095-02	1034SB004 (5-6)
05/08/08	05/09/08	0805095-04	1041SB002 (7-8)
05/08/08	05/09/08	0805095-08	1041SB004 (7-8)
05/08/08	05/09/08	0805095-10	1034SB001 (7-8)
05/08/08	05/09/08	0805095-12	1034SB008 (4-5)
05/09/08	05/10/08	0805105-01	1041SB003 (7-8)
05/09/08	05/10/08	0805105-02	1041SB001 (7-8)
05/09/08	05/10/08	0805105-03	1034SB006 (7-8)
05/09/08	05/10/08	0805105-04	1034SB007 (7-8)

Method: The samples were extracted/analyzed by USEPA SW-846 Method 3541/8082 (automated soxhlet extraction followed by dual capillary column GC/ECD) for soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note1: Some soil samples were requested for rush TAT while others were requested to be held pending rush results. Extraction for the included samples was requested 5/19/08 – analysis was requested 6/9/08. E-mail instructions are attached.
- Calibration Criteria: All method calibration criteria were met with the exception of the surrogate DCB exceeding with a high bias in the CCV analyzed 6/11/08 at 11:41. Surrogate recoveries were evaluated and determined not to have been biased into control by the exceedences.
- Blank Results: No target analytes were detected.
- Surrogate Recoveries: All recoveries were within limits.
- LCS Results: All recoveries were within limits.
- MS/MSD results: All recoveries and relative percent differences were within limits.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.



Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Monday, June 09, 2008 9:26 AM
To: MMcGinnity@EmpirLabs.com
Cc: Sharpe, Christopher; Powell, Jace'que; Borne, Rachelle
Subject: RADford Hold Samples

Hi Marcia

Authorization has been given for all of the remaining samples (approximately 12) to be analyzed for all parameters listed on the COCs: SVOCs, Explosives, PCBs, and Metals. These are the samples beginning with 1034, 1041, and 1549.

Can you please log these in for analysis for standard TAT and let me know what the due date will be? I think that would be June 30th, but if you can get them done quicker since they are already extracted that would be great.

The 2 Ditch samples that were cancelled, remain cancelled.

Thanks
Jane

Jane Kennedy
Principal Scientist
ARCADIS US, Inc.
850 N. Causeway Blvd.
Suite 1600
Metairie, LA 70002
Phone: (504) 832-4174 Ext 106
Cell: (225) 205-8256
E-mail: jane.kennedy@arcadis-us.com

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FORM 2
SOIL PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Column(1): ZB MR-1 ID: 0.32 (mm) Column(2): ZB MR-2 ID: 0.32 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PS1BLK0520	104	98	112	126			0
02	PS1BLK0520LC	104	96	101	112			0
03	1549SB001(7-	103	96	109	120			0
04	1549SB004(5-	108	104	100	99			0
05	1549SB006(5-	108	103	110	123			0
06	1549SB003(5-	106	103	105	116			0
07	1034SB004 (5	99	94	96	108			0
08	1041SB002 (7	101	96	106	118			0
09	1041SB004 (7	102	98	102	114			0
10	1034SB001 (7	102	100	99	113			0
11	1034SB008 (4	101	93	102	102			0
12	1041SB003 (7	96	97	96	112			0
13	1041SB001 (7	106	107	105	122			0
14	1034SB006 (7	105	106	110	129			0
15	1034SB007 (7	103	104	113	131			0
16	1034SB007 (7	104	104	109	128			0
17	1034SB007 (7	98	99	102	120			0
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		EL QC LIMITS	SPIKE CONC (ug/Kg)
S1	= TCMX	(30-120)	17
S2	= DCB	(35-140)	17

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: PS1BLK0520

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PCB-1016	166.7	0.0000	171.3	103	30-140
PCB-1260	166.7	0.0000	148.6	89	40-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 2 outside limits

COMMENTS: _____

FORM 3
SOIL PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
PCB-1016	184.2	0.0000	204.9	111	45-120
PCB-1260	184.2	0.0000	177.5	96	40-125

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	180.6	186.0	103	10	50	45-120
PCB-1260	180.6	159.1	88	11	50	40-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PS1BLK0520

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Lab Sample ID: PS1BLK0520 Lab File ID: 042F4301

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SOXH

Sulfur Cleanup (Y/N) Y Date Extracted: 05/20/08

Date Analyzed (1): 06/11/08 Date Analyzed (2): 06/11/08

Time Analyzed (1): 0720 Time Analyzed (2): 0720

Instrument ID (1): ECD3 Instrument ID (2): ECD3

Column (1): ZB MR-1 ID: 0.32(mm) Column (2): ZB MR-2 ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PS1BLK0520LC	PS1BLK0520LCS	06/11/08	06/11/08
02	1549SB001(7-	0805074-06	06/11/08	06/11/08
03	1549SB004(5-	0805074-09	06/11/08	06/11/08
04	1549SB006(5-	0805074-11	06/11/08	06/11/08
05	1549SB003(5-	0805074-12	06/11/08	06/11/08
06	1034SB004 (5	0805095-02	06/11/08	06/11/08
07	1041SB002 (7	0805095-04	06/11/08	06/11/08
08	1041SB004 (7	0805095-08	06/11/08	06/11/08
09	1034SB001 (7	0805095-10	06/11/08	06/11/08
10	1034SB008 (4	0805095-12	06/11/08	06/11/08
11	1041SB003 (7	0805105-01	06/11/08	06/11/08
12	1041SB001 (7	0805105-02	06/11/08	06/11/08
13	1034SB006 (7	0805105-03	06/11/08	06/11/08
14	1034SB007 (7	0805105-04	06/11/08	06/11/08
15	1034SB007 (7	0805105-04MS	06/11/08	06/11/08
16	1034SB007 (7	0805105-04MSD	06/11/08	06/11/08
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB001(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 044F4501

% Moisture: 15 decanted: (Y/N) N Date Sampled: 05/07/08 10:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 07:57

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.9	20		U
11104-28-2	PCB-1221	4.9	20		U
11141-16-5	PCB-1232	4.9	20		U
53469-21-9	PCB-1242	4.9	20		U
12672-29-6	PCB-1248	4.9	20		U
11097-69-1	PCB-1254	4.9	20		U
11096-82-5	PCB-1260	4.9	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-09

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 045F4601

% Moisture: 22 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 08:16

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.3	21		U
11104-28-2	PCB-1221	5.3	21		U
11141-16-5	PCB-1232	5.3	21		U
53469-21-9	PCB-1242	5.3	21		U
12672-29-6	PCB-1248	5.3	21		U
11097-69-1	PCB-1254	5.3	21	21	(1)
11096-82-5	PCB-1260	5.3	21		U

(1) = THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLOR IN THE SAMPLE WAS IDENTIFIED AS THE AROCLOR IT MOST CLOSELY MATCHED.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-11

Sample wt/vol: 15.5 (g/mL) G Lab File ID: 046F4701

% Moisture: 21 decanted: (Y/N) N Date Sampled: 05/07/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 08:34

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.1	20		U
11104-28-2	PCB-1221	5.1	20		U
11141-16-5	PCB-1232	5.1	20		U
53469-21-9	PCB-1242	5.1	20		U
12672-29-6	PCB-1248	5.1	20		U
11097-69-1	PCB-1254	5.1	20		U
11096-82-5	PCB-1260	5.1	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-12

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 047F4801

% Moisture: 13 decanted: (Y/N) N Date Sampled: 05/07/08 15:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 08:53

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.8	19		U
11104-28-2	PCB-1221	4.8	19		U
11141-16-5	PCB-1232	4.8	19		U
53469-21-9	PCB-1242	4.8	19		U
12672-29-6	PCB-1248	4.8	19		U
11097-69-1	PCB-1254	4.8	19		U
11096-82-5	PCB-1260	4.8	19		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 048F4901

% Moisture: 37 decanted: (Y/N) N Date Sampled: 05/08/08 18:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 09:11

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	6.6	26		U
11104-28-2	PCB-1221	6.6	26		U
11141-16-5	PCB-1232	6.6	26		U
53469-21-9	PCB-1242	6.6	26		U
12672-29-6	PCB-1248	6.6	26		U
11097-69-1	PCB-1254	6.6	26		U
11096-82-5	PCB-1260	6.6	26		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB002 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-04

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 049F5001

% Moisture: 23 decanted: (Y/N) N Date Sampled: 05/08/08 19:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 09:30

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.3	21		U
11104-28-2	PCB-1221	5.3	21		U
11141-16-5	PCB-1232	5.3	21		U
53469-21-9	PCB-1242	5.3	21		U
12672-29-6	PCB-1248	5.3	21		U
11097-69-1	PCB-1254	5.3	21		U
11096-82-5	PCB-1260	5.3	21		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-08

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 050F5101

% Moisture: 31 decanted: (Y/N) N Date Sampled: 05/08/08 14:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 09:48

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	6.0	24		U
11104-28-2	PCB-1221	6.0	24		U
11141-16-5	PCB-1232	6.0	24		U
53469-21-9	PCB-1242	6.0	24		U
12672-29-6	PCB-1248	6.0	24		U
11097-69-1	PCB-1254	6.0	24		U
11096-82-5	PCB-1260	6.0	24		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-10

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 055F0501

% Moisture: 27 decanted: (Y/N) N Date Sampled: 05/08/08 14:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 12:56

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.6	22		U
11104-28-2	PCB-1221	5.6	22		U
11141-16-5	PCB-1232	5.6	22		U
53469-21-9	PCB-1242	5.6	22		U
12672-29-6	PCB-1248	5.6	22		U
11097-69-1	PCB-1254	5.6	22		U
11096-82-5	PCB-1260	5.6	22		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008 (4-5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-12

Sample wt/vol: 15.4 (g/mL) G Lab File ID: 056F0601

% Moisture: 15 decanted: (Y/N) N Date Sampled: 05/08/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 13:14

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.8	19		U
11104-28-2	PCB-1221	4.8	19		U
11141-16-5	PCB-1232	4.8	19		U
53469-21-9	PCB-1242	4.8	19		U
12672-29-6	PCB-1248	4.8	19		U
11097-69-1	PCB-1254	4.8	19		U
11096-82-5	PCB-1260	4.8	19	24	(1)

(1) = THE AROCLOR PATTERN OF THE SAMPLE DID NOT COMPARE WELL WITH THE AROCLOR PATTERN OF THE STANDARDS. THE AROCLOR IN THE SAMPLE WAS IDENTIFIED AS THE AROCLOR IT MOST CLOSELY MATCHED.

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-01

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 057F0701

% Moisture: 33 decanted: (Y/N) N Date Sampled: 05/09/08 10:46

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 13:33

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	6.2	25		U
11104-28-2	PCB-1221	6.2	25		U
11141-16-5	PCB-1232	6.2	25		U
53469-21-9	PCB-1242	6.2	25		U
12672-29-6	PCB-1248	6.2	25		U
11097-69-1	PCB-1254	6.2	25		U
11096-82-5	PCB-1260	6.2	25		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-02

Sample wt/vol: 15.1 (g/mL) G Lab File ID: 058F0801

% Moisture: 34 decanted: (Y/N) N Date Sampled: 05/09/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 13:51

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	6.3	25		U
11104-28-2	PCB-1221	6.3	25		U
11141-16-5	PCB-1232	6.3	25		U
53469-21-9	PCB-1242	6.3	25		U
12672-29-6	PCB-1248	6.3	25		U
11097-69-1	PCB-1254	6.3	25		U
11096-82-5	PCB-1260	6.3	25		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-03

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 059F0901

% Moisture: 20 decanted: (Y/N) N Date Sampled: 05/09/08 13:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 14:10

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.1	20		U
11104-28-2	PCB-1221	5.1	20		U
11141-16-5	PCB-1232	5.1	20		U
53469-21-9	PCB-1242	5.1	20		U
12672-29-6	PCB-1248	5.1	20		U
11097-69-1	PCB-1254	5.1	20		U
11096-82-5	PCB-1260	5.1	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 060F1001

% Moisture: 10 decanted: (Y/N) N Date Sampled: 05/09/08 13:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:05/20/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/11/08 14:28

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.6	18		U
11104-28-2	PCB-1221	4.6	18		U
11141-16-5	PCB-1232	4.6	18		U
53469-21-9	PCB-1242	4.6	18		U
12672-29-6	PCB-1248	4.6	18		U
11097-69-1	PCB-1254	4.6	18		U
11096-82-5	PCB-1260	4.6	18		U

Explosives Section

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB001(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-06

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 017V1701

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 10:50

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 19:07

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB004(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-09

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 018V1801

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 19:38

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB006(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 019V1901

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 20:08

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1549SB003(5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805074-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 020V2001

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/07/08 15:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 20:38

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB004 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-02

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 021V2101

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 18:45

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 21:09

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB002 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-04

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 022V2201

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 19:20

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 21:39

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB004 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-08

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 023V2301

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 14:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 22:09

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 026V2601

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 14:50

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 23:38

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB008 (4-5)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805095-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 027V2701

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/08/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/12/08 00:08

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB003 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-01

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 028V2801

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 10:46

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/12/08 00:39

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB001 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-02

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 029V2901

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 12:25

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/12/08 01:09

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB006 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-03

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 030V3001

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 13:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/12/08 01:39

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1034SB007 (7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: 0805105-04

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 031V3101

% Moisture: 0 decanted: (Y/N) N Date Sampled: 05/09/08 13:40

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/12/08 02:10

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

FORM 2
SOIL EXPL SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC	#	S1 2 %REC	#	S2 1 %REC	#	S2 2 %REC	#	S3 1 %REC	#	S3 2 %REC	#	TOT OUT
01	ES1BLK0521	106												0
02	ES1BLK0521LC	103												0
03	ES1BLK0521LC	106												0
04	1549SB001(7-	104												0
05	1549SB004(5-	106												0
06	1549SB006(5-	106												0
07	1549SB003(5-	107		115										0
08	1034SB004 (5	108												0
09	1041SB002 (7	107		116										0
10	1041SB004 (7	106		113										0
11	1034SB001 (7	106		115										0
12	1034SB008 (4	107												0
13	1041SB003 (7	103		113										0
14	1041SB001 (7	102												0
15	1034SB006 (7	104												0
16	1034SB007 (7	108		115										0
17	1034SB007 (7	98												0
18	1034SB007 (7	98												0
19	1034SB007 (7	106												0
20	1034SB007 (7	105												0
21	1549SB001(7-			107										0
22	1549SB003(5-			110										0
23														
24														
25														
26														
27														
28														
29														
30														

		EL QC LIMITS	SPIKE CONC (mg/Kg)
S1	= 1,2-Dinitrobenzene	(55-140)	1.0

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: ES1BLK0521

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC #	QC. LIMITS REC.
HMX	5.000	0.0000	5.098	102	75-140
RDX	5.000	0.0000	5.258	105	80-120
Nitrobenzene	5.000	0.0000	5.380	108	20-145
1,3-Dinitrobenzene	5.000	0.0000	5.389	108	85-130
1,3,5-Trinitrobenzene	5.000	0.0000	5.159	103	70-120
2,4-Dinitrotoluene	5.000	0.0000	4.974	99	75-130
2,6-Dinitrotoluene	5.000	0.0000	5.179	104	65-130
2,4,6-Trinitrotoluene	5.000	0.0000	4.818	96	45-140
2-Amino-4,6-dinitrotolu	5.000	0.0000	5.177	104	60-125
Tetryl	5.000	0.0000	3.734	75	55-150
4-Amino-2,6-dinitrotolu	5.000	0.0000	4.826	96	30-175
2-Nitrotoluene	5.000	0.0000	5.168	103	65-130
4-Nitrotoluene	5.000	0.0000	5.332	107	65-130
3-Nitrotoluene	5.000	0.0000	5.285	106	65-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 14 outside limits

COMMENTS: _____

FORM 3
SOIL EXPL LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: ES1BLK0521LCSN

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	LCS CONCENTRATION (mg/Kg)	LCS % REC #	QC. LIMITS REC.
Nitroglycerin	50.00	0.0000	51.92	104	60-120
PETN	50.00	0.0000	54.77	110	60-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 2 outside limits

COMMENTS: _____

FORM 3
SOIL EXPL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC #	QC. LIMITS REC.
HMX	5.000	0.0000	5.062	101	75-140
RDX	5.000	0.0000	5.210	104	80-120
Nitrobenzene	5.000	0.0000	5.316	106	20-145
1,3-Dinitrobenzene	5.000	0.0000	5.328	106	85-130
1,3,5-Trinitrobenzene	5.000	0.0000	5.196	104	70-120
2,4-Dinitrotoluene	5.000	0.0000	4.933	99	75-130
2,6-Dinitrotoluene	5.000	0.0000	5.047	101	65-130
2,4,6-Trinitrotoluene	5.000	0.0000	4.764	95	45-140
2-Amino-4,6-dinitrotolu	5.000	0.0000	5.190	104	60-125
Tetryl	5.000	0.0000	4.355	87	55-150
4-Amino-2,6-dinitrotolu	5.000	0.0000	4.809	96	30-175
2-Nitrotoluene	5.000	0.0000	5.213	104	65-130
4-Nitrotoluene	5.000	0.0000	5.336	107	65-130
3-Nitrotoluene	5.000	0.0000	5.230	105	65-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL EXPL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8) Lab Sample ID: 0805105-04

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONCENTRATION (mg/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
HMX	5.000	5.140	103	2	50	75-140
RDX	5.000	5.272	105	1	50	80-120
Nitrobenzene	5.000	5.364	107	1	50	20-145
1,3-Dinitrobenzene	5.000	5.363	107	1	50	85-130
1,3,5-Trinitrobenzene	5.000	5.256	105	1	50	70-120
2,4-Dinitrotoluene	5.000	4.969	99	1	50	75-130
2,6-Dinitrotoluene	5.000	5.123	102	1	50	65-130
2,4,6-Trinitrotoluene	5.000	4.804	96	1	50	45-140
2-Amino-4,6-dinitrotolu	5.000	5.255	105	1	50	60-125
Tetryl	5.000	4.511	90	4	50	55-150
4-Amino-2,6-dinitrotolu	5.000	4.830	97	0	50	30-175
2-Nitrotoluene	5.000	5.248	105	1	50	65-130
4-Nitrotoluene	5.000	5.414	108	1	50	65-130
3-Nitrotoluene	5.000	5.321	106	2	50	65-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 14 outside limits
Spike Recovery: 0 out of 28 outside limits

COMMENTS: _____

FORM 3
SOIL EXPL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix Spike - Client Sample No.: 1034SB007 (7-8)N Lab Sample ID: 0805105-04N

COMPOUND	SPIKE ADDED (mg/Kg)	SAMPLE CONCENTRATION (mg/Kg)	MS CONCENTRATION (mg/Kg)	MS % REC #	QC. LIMITS REC.
Nitroglycerin	50.00	0.0000	52.42	105	60-120
PETN	50.00	0.0000	57.13	114	60-120

COMPOUND	SPIKE ADDED (mg/Kg)	MSD CONCENTRATION (mg/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Nitroglycerin	50.00	51.31	103	2	40	60-120
PETN	50.00	52.87	106	8	40	60-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 4
EXPL METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

ES1BLK0521

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Lab Sample ID: ES1BLK0521 Lab File ID: 014V1401

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SONC

Sulfur Cleanup (Y/N) N Date Extracted: 05/21/08

Date Analyzed (1): 06/11/08 Date Analyzed (2):

Time Analyzed (1): 1739 Time Analyzed (2):

Instrument ID (1): HPLC2 Instrument ID (2): HPLC2

Column(1): ULTRA C-18 ID: 4.60 (mm) Column(2): SYNERGI POLAR-RP ID: 4.60 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	ES1BLK0521LC	ES1BLK0521LCS	06/11/08	
02	ES1BLK0521LC	ES1BLK0521LCSN	06/11/08	
03	1549SB001(7-	0805074-06	06/11/08	
04	1549SB004(5-	0805074-09	06/11/08	
05	1549SB006(5-	0805074-11	06/11/08	
06	1549SB003(5-	0805074-12	06/11/08	06/17/08
07	1034SB004 (5	0805095-02	06/11/08	
08	1041SB002 (7	0805095-04	06/11/08	06/18/08
09	1041SB004 (7	0805095-08	06/11/08	06/18/08
10	1034SB001 (7	0805095-10	06/11/08	06/18/08
11	1034SB008 (4	0805095-12	06/12/08	
12	1041SB003 (7	0805105-01	06/12/08	06/18/08
13	1041SB001 (7	0805105-02	06/12/08	
14	1034SB006 (7	0805105-03	06/12/08	
15	1034SB007 (7	0805105-04	06/12/08	06/18/08
16	1034SB007 (7	0805105-04MS	06/12/08	
17	1034SB007 (7	0805105-04MSD	06/12/08	
18	1034SB007 (7	0805105-04MSN	06/12/08	
19	1034SB007 (7	0805105-04MSDN	06/12/08	
20	1549SB001(7-	0805074-06		06/24/08
21	1549SB003(5-	0805074-12		06/24/08
22				
23				
24				
25				
26				

COMMENTS:

FORM 1
EXPL ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ES1BLK0521

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: RADFORD003

Matrix: (soil/water) SOIL Lab Sample ID: ES1BLK0521

Sample wt/vol: 2.0 (g/mL) G Lab File ID: 014V1401

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:05/21/08

Concentrated Extract Volume: 20.0(ml) Date Analyzed: 06/11/08 17:39

Injection Volume: 100.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
2691-41-0	HMX	0.10	0.25		U
121-82-4	RDX	0.10	0.25		U
98-95-3	Nitrobenzene	0.11	0.25		U
99-65-0	1,3-Dinitrobenzene	0.10	0.25		U
99-35-4	1,3,5-Trinitrobenzene	0.10	0.25		U
121-14-2	2,4-Dinitrotoluene	0.13	0.25		U
606-20-2	2,6-Dinitrotoluene	0.13	0.25		U
118-96-7	2,4,6-Trinitrotoluene	0.10	0.25		U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	0.25		U
479-45-8	Tetryl	0.10	0.25		U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	0.25		U
88-72-2	2-Nitrotoluene	0.10	0.25		U
99-99-0	4-Nitrotoluene	0.10	0.25		U
99-08-1	3-Nitrotoluene	0.15	0.25		U
55-63-0	Nitroglycerin	1.6	5.0		U
78-11-5	PETN	1.6	5.0		U

Inorganic Section

INORGANIC CASE NARRATIVE
Arcadis
SDG# Radford003
Work Order# 0805074, 0805095, 0805105
May, 2008

Empirical Laboratories ID	Client ID
0805074-06	1549SB001 (7-8)
0805074-09	1549SB004 (5-6)
0805074-11	1549SB006 (5-6)
0805074-12	1549SB003 (5-6)
0805095-02	1034SB004 (5-6)
0805095-04	1041SB002 (7-8)
0805095-08	1041SB004 (7-8)
0805095-10	1034SB001 (7-8)
0805095-12	1034SB008 (4-5)
0805105-01	1041SB003 (7-8)
0805105-02	1041SB001 (7-8)
0805105-03	1034SB006 (7-8)
0805105-04	1034SB007 (7-8)

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Betty DeVille
Inorganic Lab Manager

Methods:

The samples were digested for ICAP metals using USEPA SW846 method 3050B for the soil samples and analyzed by 6010B. Mercury was digested and analyzed by 7471A for the soil samples. % solids were analyzed by method SM2540B from Standard Methods 19th Edition. Note: The "U" flag on the forms indicates that the analyte is reported down to the MDL. The "B" flag indicates that the analyte result is between the CRDL and the laboratory MDL.

Specific Comments:

All analyses performed by the Inorganic section were completed meeting satisfactorily the corresponding specifications for Quality Control with the following exceptions:

I. ICAP Metals

A. Matrix Spike and Matrix Spike Duplicate (MS/MSD) Specification Limits (75 to 125%)

1. The matrix spike and the matrix spike duplicate were out of the

specification limits for antimony at 33.9 and 37.9% and for manganese at 224.8 and 313.0% on sample 1034SB007 (7-8). The post digestion spike recovery was at 95.6% for antimony and at 102.5% for manganese. **All associated data is flagged with an "N" on the final report.**

B. USEPA Holding Time
Specification Limits (28 days)

1. The samples were put on hold by the client when received and taken off of hold after the holding time had expired. Samples were taken on 5/7/08, 5/8/08 and 5/9/08 and analyzed on 6/11/08 at 35 days, 34 days and 33 days.

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0805074-06	1549SB001(7-8)	Solid	05/07/08 10:50:00 AM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805074-09	1549SB004(5-6)	Solid	05/07/08 12:00:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805074-09	1549SB004(5-6)	Solid	05/07/08 12:00:00 PM	Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805074-11	1549SB006(5-6)	Solid	05/07/08 12:25:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805074-12	1549SB003(5-6)	Solid	05/07/08 3:00:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium

Lab Sample ID	Field ID	Matrix	Date _Time Sampled	Parameters requested
0805074-12	1549SB003(5-6)	Solid	05/07/08 3:00:00 PM	Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0805095-02	1034SB004 (5-6)	Solid	05/08/08 6:45:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-04	1041SB002 (7-8)	Solid	05/08/08 7:20:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805095-04	1041SB002 (7-8)	Solid	05/08/08 7:20:00 PM	Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-08	1041SB004 (7-8)	Solid	05/08/08 2:00:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-10	1034SB001 (7-8)	Solid	05/08/08 2:50:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805095-10	1034SB001 (7-8)	Solid	05/08/08 2:50:00 PM	Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805095-12	1034SB008 (4-5)	Solid	05/08/08 3:30:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0805105-01	1041SB003 (7-8)	Solid	05/09/08 10:46:00 AM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805105-02	1041SB001 (7-8)	Solid	05/09/08 12:25:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0805105-02	1041SB001 (7-8)	Solid	05/09/08 12:25:00 PM	Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805105-03	1034SB006 (7-8)	Solid	05/09/08 1:00:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0805105-04	1034SB007 (7-8)	Solid	05/09/08 1:40:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium

Lab Sample ID	Field ID	Matrix	Date _Time Sampled	Parameters requested
0805105-04	1034SB007 (7-8)	Solid	05/09/08 1:40:00 PM	Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc

Sample Delivery Group Assignment Form

CLIENT: Arcadis
PROJECT NAME: RAAD
SDG # Radford003
MATRIX: Groundwater/Soil

QC LEVEL: IV/EDD
Analytical Due: 06/25/08
Report Due: 06/30/08
CLOSED: 06/09/08

Sample Type/count	Date Sampled	Date Rec'd	Lab ID	Client ID	SVOC 8270	PCBs 8082	EXPL+2 8330B	TAL Metals 6010B/7471A
1	05/07/08	05/08/08	0805074-06	1549SB001(7-8)	X	X	X	X
2	05/07/08	05/08/08	0805074-09	1549SB004(5-6)	X	X	X	X
3	05/07/08	05/08/08	0805074-11	1549SB006(5-6)	X	X	X	X
4	05/07/08	05/08/08	0805074-12	1549SB003(5-6)	X	X	X	X
5	05/08/08	05/09/08	0805095-02	1034SB004 (5-6)	X	X	X	X
6	05/08/08	05/09/08	0805095-04	1041SB002 (7-8)	X	X	X	X
7	05/08/08	05/09/08	0805095-08	1041SB004 (7-8)	X	X	X	X
8	05/08/08	05/09/08	0805095-10	1034SB001 (7-8)	X	X	X	X
9	05/08/08	05/09/08	0805095-12	1034SB008 (4-5)	X	X	X	X
10	05/09/08	05/10/08	0805105-01	1041SB003 (7-8)	X	X	X	X
11	05/09/08	05/10/08	0805105-02	1041SB001 (7-8)	X	X	X	X
12	05/09/08	05/10/08	0805105-03	1034SB006 (7-8)	X	X	X	X
13	05/09/08	05/10/08	0805105-04	1034SB007 (7-8)	X	X	X	X

Extractables requested for extraction 5/16/08. All samples requested for analysis 6/9/08.

USEPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

OW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
1549SB001(7-8)	0805074-06
1549SB004(5-6)	0805074-09
1549SB006(5-6)	0805074-11
1549SB003(5-6)	0805074-12
1034SB004 (5-6)	0805095-02
1041SB002 (7-8)	0805095-04
1041SB004 (7-8)	0805095-08
1034SB001 (7-8)	0805095-10
1034SB008 (4-5)	0805095-12
1041SB003 (7-8)	0805105-01
1041SB001 (7-8)	0805105-02
1034SB006 (7-8)	0805105-03
1034SB007 (7-8)	0805105-04
1034SB007 (7-8)S	0805105-04S
1034SB007 (7-8)SD	0805105-04SD

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

ignature: _____ Name: D. Rick Davis

ate: _____ Title: Vice-President

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB001(7-8)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805074-06

Level (low/med): LOW Date Received: 05/08/08

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15000			P
7440-36-0	Antimony	1.1	U	N	P
7440-38-2	Arsenic	1.7	B		P
7440-39-3	Barium	41.6			P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	0.26	B		P
7440-70-2	Calcium	320	B		P
7440-47-3	Chromium	19.8			P
7440-48-4	Cobalt	1.7	B		P
7440-50-8	Copper	5.1	B		P
7439-89-6	Iron	19400			P
7439-92-1	Lead	10.2			P
7439-95-4	Magnesium	654	B		P
7439-96-5	Manganese	83.6		N	P
7439-97-6	Mercury	0.054			AV
7440-02-0	Nickel	3.1			P
7440-09-7	Potassium	559	B		P
7782-49-2	Selenium	0.69	U		P
7440-22-4	Silver	0.23	U		P
7440-23-5	Sodium	228	U		P
7440-28-0	Thallium	0.69	U		P
7440-62-2	Vanadium	41.2			P
7440-66-6	Zinc	16.7			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB004(5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805074-09

Level (low/med): LOW Date Received: 05/08/08

% Solids: 78.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21500			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	4.1			P
7440-39-3	Barium	68.7			P
7440-41-7	Beryllium	0.78	B		P
7440-43-9	Cadmium	0.54	B		P
7440-70-2	Calcium	16000			P
7440-47-3	Chromium	25.8			P
7440-48-4	Cobalt	8.8			P
7440-50-8	Copper	29.5			P
7439-89-6	Iron	25100			P
7439-92-1	Lead	62.2			P
7439-95-4	Magnesium	10600			P
7439-96-5	Manganese	341		N	P
7439-97-6	Mercury	0.069			AV
7440-02-0	Nickel	11.6			P
7440-09-7	Potassium	1200	B		P
7782-49-2	Selenium	0.76	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	254	U		P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	47.8			P
7440-66-6	Zinc	40.4			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB006(5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805074-11

Level (low/med): LOW Date Received: 05/08/08

% Solids: 79.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	27100			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	5.2			P
7440-39-3	Barium	78.8			P
7440-41-7	Beryllium	1.2	B		P
7440-43-9	Cadmium	0.64	B		P
7440-70-2	Calcium	953	B		P
7440-47-3	Chromium	35.5			P
7440-48-4	Cobalt	10.1			P
7440-50-8	Copper	20.0			P
7439-89-6	Iron	34500			P
7439-92-1	Lead	13.4			P
7439-95-4	Magnesium	3890			P
7439-96-5	Manganese	147		N	P
7439-97-6	Mercury	0.065			AV
7440-02-0	Nickel	17.5			P
7440-09-7	Potassium	1970			P
7782-49-2	Selenium	0.74	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	248	U		P
7440-28-0	Thallium	0.74	U		P
7440-62-2	Vanadium	59.7			P
7440-66-6	Zinc	28.4			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549SB003(5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805074-12

Level (low/med): LOW Date Received: 05/08/08

% Solids: 87.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7080			P
7440-36-0	Antimony	1.1	U	N	P
7440-38-2	Arsenic	1.5	B		P
7440-39-3	Barium	59.9			P
7440-41-7	Beryllium	0.36	B		P
7440-43-9	Cadmium	0.23	U		P
7440-70-2	Calcium	1560			P
7440-47-3	Chromium	10.0			P
7440-48-4	Cobalt	3.4	B		P
7440-50-8	Copper	3.5	B		P
7439-89-6	Iron	7490			P
7439-92-1	Lead	11.2			P
7439-95-4	Magnesium	980	B		P
7439-96-5	Manganese	201		N	P
7439-97-6	Mercury	0.014	U		AV
7440-02-0	Nickel	2.5			P
7440-09-7	Potassium	301	B		P
7782-49-2	Selenium	0.68	U		P
7440-22-4	Silver	0.23	U		P
7440-23-5	Sodium	228	U		P
7440-28-0	Thallium	0.68	U		P
7440-62-2	Vanadium	19.8			P
7440-66-6	Zinc	14.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB004 (5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805095-02

Level (low/med): LOW Date Received: 05/09/08

% Solids: 63.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	34000			P
7440-36-0	Antimony	1.6	U	N	P
7440-38-2	Arsenic	4.4			P
7440-39-3	Barium	47.7			P
7440-41-7	Beryllium	2.3			P
7440-43-9	Cadmium	0.69	B		P
7440-70-2	Calcium	546	B		P
7440-47-3	Chromium	25.1			P
7440-48-4	Cobalt	34.5			P
7440-50-8	Copper	29.7			P
7439-89-6	Iron	49500			P
7439-92-1	Lead	102			P
7439-95-4	Magnesium	9880			P
7439-96-5	Manganese	979		N	P
7439-97-6	Mercury	0.021	U		AV
7440-02-0	Nickel	30.3			P
7440-09-7	Potassium	6270			P
7782-49-2	Selenium	0.94	U		P
7440-22-4	Silver	0.31	U		P
7440-23-5	Sodium	314	U		P
7440-28-0	Thallium	0.94	U		P
7440-62-2	Vanadium	76.0			P
7440-66-6	Zinc	182			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041SB002 (7-8)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805095-04

Level (low/med): LOW Date Received: 05/09/08

% Solids: 78.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	23900			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	3.7			P
7440-39-3	Barium	73.3			P
7440-41-7	Beryllium	0.83	B		P
7440-43-9	Cadmium	0.37	B		P
7440-70-2	Calcium	5080			P
7440-47-3	Chromium	27.2			P
7440-48-4	Cobalt	12.4			P
7440-50-8	Copper	13.4			P
7439-89-6	Iron	36900			P
7439-92-1	Lead	10.2			P
7439-95-4	Magnesium	3890			P
7439-96-5	Manganese	538		N	P
7439-97-6	Mercury	0.057			AV
7440-02-0	Nickel	12.2			P
7440-09-7	Potassium	1230	B		P
7782-49-2	Selenium	0.75	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	249	U		P
7440-28-0	Thallium	0.75	U		P
7440-62-2	Vanadium	49.9			P
7440-66-6	Zinc	24.7			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041SB004 (7-8)

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

atrix (soil/water): SOLID Lab Sample ID: 0805095-08

evel (low/med): LOW Date Received: 05/09/08

Solids: 69.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29200			P
7440-36-0	Antimony	1.4	U	N	P
7440-38-2	Arsenic	1.9	B		P
7440-39-3	Barium	76.3			P
7440-41-7	Beryllium	2.5			P
7440-43-9	Cadmium	0.49	B		P
7440-70-2	Calcium	653	B		P
7440-47-3	Chromium	38.3			P
7440-48-4	Cobalt	13.3			P
7440-50-8	Copper	9.0			P
7439-89-6	Iron	60900			P
7439-92-1	Lead	2.5			P
7439-95-4	Magnesium	7190			P
7439-96-5	Manganese	893		N	P
7439-97-6	Mercury	0.017	U		AV
7440-02-0	Nickel	24.7			P
7440-09-7	Potassium	5150			P
7782-49-2	Selenium	0.84	U		P
7440-22-4	Silver	0.28	U		P
7440-23-5	Sodium	281	U		P
7440-28-0	Thallium	0.84	U		P
7440-62-2	Vanadium	67.4			P
7440-66-6	Zinc	57.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB001 (7-8)

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

atrix (soil/water): SOLID Lab Sample ID: 0805095-10

evel (low/med): LOW Date Received: 05/09/08

Solids: 73.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	41000			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	1.9	B		P
7440-39-3	Barium	74.7			P
7440-41-7	Beryllium	1.1	B		P
7440-43-9	Cadmium	0.31	B		P
7440-70-2	Calcium	764	B		P
7440-47-3	Chromium	47.4			P
7440-48-4	Cobalt	8.0			P
7440-50-8	Copper	28.8			P
7439-89-6	Iron	47600			P
7439-92-1	Lead	20.7			P
7439-95-4	Magnesium	2530			P
7439-96-5	Manganese	164		N	P
7439-97-6	Mercury	0.017	B		AV
7440-02-0	Nickel	19.9			P
7440-09-7	Potassium	2210			P
7782-49-2	Selenium	0.77	U		P
7440-22-4	Silver	0.26	U		P
7440-23-5	Sodium	256	U		P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	101			P
7440-66-6	Zinc	56.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB008 (4-5)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805095-12

Level (low/med): LOW Date Received: 05/09/08

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12800			P
7440-36-0	Antimony	1.1	U	N	P
7440-38-2	Arsenic	11.7			P
7440-39-3	Barium	174			P
7440-41-7	Beryllium	1.0	B		P
7440-43-9	Cadmium	0.30	B		P
7440-70-2	Calcium	771	B		P
7440-47-3	Chromium	13.7			P
7440-48-4	Cobalt	10.8			P
7440-50-8	Copper	13.6			P
7439-89-6	Iron	49300			P
7439-92-1	Lead	4.6			P
7439-95-4	Magnesium	768	B		P
7439-96-5	Manganese	1090		N	P
7439-97-6	Mercury	0.25			AV
7440-02-0	Nickel	10.5			P
7440-09-7	Potassium	735	B		P
7782-49-2	Selenium	0.65	U		P
7440-22-4	Silver	0.22	U		P
7440-23-5	Sodium	218	U		P
7440-28-0	Thallium	0.65	U		P
7440-62-2	Vanadium	37.1			P
7440-66-6	Zinc	26.6			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041SB003 (7-8)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805105-01

Level (low/med): LOW Date Received: 05/10/08

% Solids: 67.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	22000			P
7440-36-0	Antimony	1.5	U	N	P
7440-38-2	Arsenic	0.88	U		P
7440-39-3	Barium	35.5			P
7440-41-7	Beryllium	1.5			P
7440-43-9	Cadmium	0.29	U		P
7440-70-2	Calcium	645	B		P
7440-47-3	Chromium	16.8			P
7440-48-4	Cobalt	8.0			P
7440-50-8	Copper	4.0	B		P
7439-89-6	Iron	41600			P
7439-92-1	Lead	1.9			P
7439-95-4	Magnesium	1470			P
7439-96-5	Manganese	487		N	P
7439-97-6	Mercury	0.019	U		AV
7440-02-0	Nickel	14.5			P
7440-09-7	Potassium	2140			P
7782-49-2	Selenium	0.88	U		P
7440-22-4	Silver	0.29	U		P
7440-23-5	Sodium	293	U		P
7440-28-0	Thallium	0.88	U		P
7440-62-2	Vanadium	29.0			P
7440-66-6	Zinc	16.0			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041SB001 (7-8)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805105-02

Level (low/med): LOW Date Received: 05/10/08

% Solids: 66.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31800			P
7440-36-0	Antimony	1.4	U	N	P
7440-38-2	Arsenic	1.6	B		P
7440-39-3	Barium	146			P
7440-41-7	Beryllium	2.3			P
7440-43-9	Cadmium	0.54	B		P
7440-70-2	Calcium	994	B		P
7440-47-3	Chromium	29.4			P
7440-48-4	Cobalt	25.5			P
7440-50-8	Copper	5.0	B		P
7439-89-6	Iron	60500			P
7439-92-1	Lead	2.0			P
7439-95-4	Magnesium	8030			P
7439-96-5	Manganese	1530		N	P
7439-97-6	Mercury	0.020	U		AV
7440-02-0	Nickel	30.7			P
7440-09-7	Potassium	1390	B		P
7782-49-2	Selenium	0.86	U		P
7440-22-4	Silver	0.29	U		P
7440-23-5	Sodium	286	U		P
7440-28-0	Thallium	0.86	U		P
7440-62-2	Vanadium	45.3			P
7440-66-6	Zinc	64.2			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB006 (7-8)

ab Name: Empirical Laboratories Contract: Arcadis

ab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

atrix (soil/water): SOLID Lab Sample ID: 0805105-03

evel (low/med): LOW Date Received: 05/10/08

Solids: 80.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14600			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	3.8			P
7440-39-3	Barium	25.8			P
7440-41-7	Beryllium	0.67	B		P
7440-43-9	Cadmium	0.24	U		P
7440-70-2	Calcium	238	U		P
7440-47-3	Chromium	45.0			P
7440-48-4	Cobalt	5.5			P
7440-50-8	Copper	10.4			P
7439-89-6	Iron	25300			P
7439-92-1	Lead	8.1			P
7439-95-4	Magnesium	525	B		P
7439-96-5	Manganese	92.4		N	P
7439-97-6	Mercury	0.017	U		AV
7440-02-0	Nickel	9.8			P
7440-09-7	Potassium	598	B		P
7782-49-2	Selenium	0.71	U		P
7440-22-4	Silver	0.24	U		P
7440-23-5	Sodium	238	U		P
7440-28-0	Thallium	0.71	U		P
7440-62-2	Vanadium	39.5			P
7440-66-6	Zinc	27.0			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1034SB007 (7-8)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Lab Sample ID: 0805105-04

Level (low/med): LOW Date Received: 05/10/08

% Solids: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12600			P
7440-36-0	Antimony	1.1	U	N	P
7440-38-2	Arsenic	4.3			P
7440-39-3	Barium	48.7			P
7440-41-7	Beryllium	0.71	B		P
7440-43-9	Cadmium	0.22	U		P
7440-70-2	Calcium	218	U		P
7440-47-3	Chromium	30.1			P
7440-48-4	Cobalt	10.4			P
7440-50-8	Copper	6.3			P
7439-89-6	Iron	23500			P
7439-92-1	Lead	4.5			P
7439-95-4	Magnesium	467	B		P
7439-96-5	Manganese	356		N	P
7439-97-6	Mercury	0.015	U		AV
7440-02-0	Nickel	10.1			P
7440-09-7	Potassium	549	B		P
7782-49-2	Selenium	0.65	U		P
7440-22-4	Silver	0.22	U		P
7440-23-5	Sodium	218	U		P
7440-28-0	Thallium	0.65	U		P
7440-62-2	Vanadium	27.2			P
7440-66-6	Zinc	18.0			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Lead	1000.0	1026.37	102.6	1000.0	1033.86	103.4	1027.19	102.7	P
Mercury	4.0	3.73	93.2	4.0	3.87	96.8	3.71	92.8	AV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Lead				1000.0	1031.41	103.1			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Aluminum	10000.0	10608.50	106.1	10000.0	10770.16	107.7	10823.05	108.2	P
Antimony	1000.0	1011.27	101.1	1000.0	1010.43	101.0	1008.56	100.9	P
Arsenic	1000.0	1016.44	101.6	1000.0	1015.84	101.6	1029.23	102.9	P
Barium	1000.0	987.67	98.8	1000.0	994.89	99.5	992.10	99.2	P
Beryllium	1000.0	1034.12	103.4	1000.0	1057.56	105.8	1072.23	107.2	P
Cadmium	1000.0	1025.58	102.6	1000.0	1020.86	102.1	1058.69	105.9	P
Calcium	1000.0	919.01	91.9	1000.0	980.62	98.1	966.70	96.7	P
Chromium	1000.0	1000.59	100.1	1000.0	1001.51	100.2	1010.03	101.0	P
Cobalt	1000.0	966.87	96.7	1000.0	990.05	99.0	1016.05	101.6	P
Copper	1000.0	1002.76	100.3	1000.0	1016.33	101.6	1023.69	102.4	P
Iron	10000.0	10391.11	103.9	10000.0	10427.53	104.3	10498.25	105.0	P
Lead	1000.0	978.87	97.9	1000.0	998.31	99.8	1013.82	101.4	P
Magnesium	1000.0	997.21	99.7	1000.0	997.14	99.7	1004.25	100.4	P
Manganese	1000.0	1024.36	102.4	1000.0	1029.62	103.0	1046.12	104.6	P
Nickel	1000.0	1003.30	100.3	1000.0	998.82	99.9	1014.26	101.4	P
Potassium	10000.0	10539.98	105.4	10000.0	10651.05	106.5	10593.05	105.9	P
Selenium	1000.0	984.08	98.4	1000.0	1003.74	100.4	1021.55	102.2	P
Silver	500.0	479.85	96.0	500.0	490.69	98.1	491.19	98.2	P
Sodium	11000.0	11000.85	100.0	11000.0	11441.80	104.0	11485.83	104.4	P
Thallium	1000.0	984.77	98.5	1000.0	988.29	98.8	963.87	96.4	P
Vanadium	1000.0	993.75	99.4	1000.0	996.32	99.6	1003.38	100.3	P
Zinc	1000.0	1000.15	100.0	1000.0	1003.90	100.4	1024.75	102.5	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum				10000.0	10761.44	107.6	10464.30	104.6	P
Antimony				1000.0	999.77	100.0	973.27	97.3	P
Arsenic				1000.0	1016.97	101.7	992.36	99.2	P
Barium				1000.0	986.84	98.7	957.25	95.7	P
Beryllium				1000.0	1056.10	105.6	1043.26	104.3	P
Cadmium				1000.0	1043.52	104.4	1023.29	102.3	P
Calcium				1000.0	943.08	94.3	941.84	94.2	P
Chromium				1000.0	996.87	99.7	977.20	97.7	P
Cobalt				1000.0	1001.73	100.2	985.30	98.5	P
Copper				1000.0	1018.50	101.8	989.30	98.9	P
Iron				10000.0	10359.00	103.6	10158.55	101.6	P
Lead				1000.0	1003.32	100.3	986.17	98.6	P
Magnesium				1000.0	999.82	100.0	972.54	97.3	P
Manganese				1000.0	1033.15	103.3	1012.72	101.3	P
Nickel				1000.0	1002.21	100.2	981.08	98.1	P
Potassium				10000.0	10562.77	105.6	10229.39	102.3	P
Selenium				1000.0	1030.42	103.0	1002.95	100.3	P
Silver				500.0	491.38	98.3	479.46	95.9	P
Sodium				11000.0	11460.39	104.2	11200.45	101.8	P
Thallium				1000.0	955.36	95.5	932.77	93.3	P
Vanadium				1000.0	991.03	99.1	968.09	96.8	P
Zinc				1000.0	1004.53	100.5	995.06	99.5	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2B-IN

CRDL STANDARD FOR AA AND ICP

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

AA CRDL Standard Source: _____

ICP CRDL Standard Source: Spex

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	Initial True	Initial Found	Initial %R	Final Found	Final %R
Lead				6.0	6.31	105.2		

Control Limits: no limits have been established by EPA at this time

USEPA - CLP

2B-IN

CRDL STANDARD FOR AA AND ICP

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

AA CRDL Standard Source: _____

ICP CRDL Standard Source: Spex

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	Initial True	Initial Found	Initial %R	Final Found	Final %R
Aluminum								
Antimony				120.0	119.87	99.9		
Arsenic				20.0	17.66	88.3		
Barium								
Beryllium				10.0	10.71	107.1		
Cadmium				10.0	10.40	104.0		
Calcium								
Chromium				20.0	20.17	100.8		
Cobalt				100.0	98.27	98.3		
Copper				50.0	49.54	99.1		
Iron								
Lead				6.0	6.06	101.0		
Magnesium								
Manganese				30.0	30.93	103.1		
Nickel				80.0	79.27	99.1		
Potassium								
Selenium				10.0	11.83	118.3		
Silver				20.0	20.03	100.2		
Sodium								
Thallium				20.0	19.18	95.9		
Vanadium				100.0	99.16	99.2		
Zinc				40.0	39.83	99.6		

Control Limits: no limits have been established by EPA at this time

USEPA - CLP

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Lead	1.5	U	1.5	U	1.5	U	1.5	U	0.300	U	P
Mercury	0.080	U	0.080	U	0.080	U			0.013	U	AV

USEPA - CLP

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	50.0	U	50.0	U	50.0	U	50.0	U	10.000	U	P
Antimony	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P
Barium	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	0.200	U	P
Cadmium	1.0	U	1.0	U	1.0	U	1.0	U	0.200	U	P
Calcium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Chromium	2.0	U	2.0	U	2.0	U	2.0	U	0.400	U	P
Cobalt	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Copper	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Iron	30.0	U	30.0	U	30.0	U	30.0	U	6.000	U	P
Lead	1.5	U	1.5	U	1.5	U	1.5	U			P
Magnesium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Manganese	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P
Nickel	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Selenium	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P
Silver	1.0	U	1.0	U	1.0	U	1.0	U	0.200	U	P
Sodium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	200.000	U	P
Thallium	3.0	U	3.0	U	3.0	U	3.0	U	0.600	U	P
Vanadium	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	1.000	U	P

USEPA - CLP

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum			50.0	U							P
Antimony			5.0	U							P
Arsenic			3.0	U							P
Barium			5.0	U							P
Beryllium			1.0	U							P
Cadmium			1.0	U							P
Calcium			1000.0	U							P
Chromium			2.0	U							P
Cobalt			5.0	U							P
Copper			5.0	U							P
Iron			30.0	U							P
Lead			1.5	U							P
Magnesium			1000.0	U							P
Manganese			3.0	U							P
Nickel			5.0	U							P
Potassium			1000.0	U							P
Selenium			3.0	U							P
Silver			1.0	U							P
Sodium			1000.0	U							P
Thallium			3.0	U							P
Vanadium			5.0	U							P
Zinc			5.0	U							P

USEPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

ICP ID Number: TJA61E TRACE ICP ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Lead	0	50	5	51.6	103.2			

USEPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

ICP ID Number: TJA61E TRACE ICP ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	500000	500000	511682	519620.1	103.9			
Antimony	0	600	0	621.8	103.6			
Arsenic	0	100	0	102.5	102.5			
Barium	0	500	2	539.1	107.8			
Beryllium	0	500	0	523.9	104.8			
Cadmium	0	1000	4	975.6	97.6			
Calcium	500000	500000	448339	456389.1	91.3			
Chromium	0	500	2	492.8	98.6			
Cobalt	0	500	0	478.0	95.6			
Copper	0	500	1	557.0	111.4			
Iron	200000	200000	196992	200303.0	100.2			
Lead	0	50	3	49.5	99.0			
Magnesium	500000	500000	515134	520924.2	104.2			
Manganese	0	500	-1	509.0	101.8			
Nickel	0	1000	-1	943.0	94.3			
Potassium	0	0	63	59.8				
Selenium	0	50	-6	41.1	82.2			
Silver	0	200	0	214.6	107.3			
Sodium	0	0	265	180.3				
Thallium	0	100	-4	90.0	90.0			
Vanadium	0	500	1	494.9	99.0			
Zinc	0	1000	-15	912.6	91.3			

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB007 (7-8)S

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Level (low/med): LOW

% Solids for Sample: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		12533.4300		12556.2800		431.50	-5.3		P
Antimony	75 - 125	18.2687		1.0893	U	53.94	33.9	N	P
Arsenic	75 - 125	52.0636		4.2585		53.94	88.6		P
Barium	75 - 125	485.2171		48.6813		431.50	101.2		P
Beryllium	75 - 125	12.2415		0.7106	B	10.79	106.9		P
Cadmium	75 - 125	27.9100		0.2179	U	26.97	103.5		P
Calcium	75 - 125	1324.9000		217.8649	U	1078.75	122.8		P
Chromium	75 - 125	68.3874		30.1150		43.15	88.7		P
Cobalt	75 - 125	121.1127		10.3717		107.87	102.7		P
Copper	75 - 125	63.3168		6.2832		53.94	105.7		P
Iron		22231.4700		23474.4800		215.75	-576.1		P
Lead	75 - 125	60.0528		4.4835		53.94	103.0		P
Magnesium	75 - 125	1681.1950		467.1917	B	1078.75	112.5		P
Manganese	75 - 125	598.7615		356.2969		107.87	224.8	N	P
Nickel	75 - 125	116.4893		10.0671		107.87	98.7		P
Potassium	75 - 125	1644.3450		548.5381	B	1078.75	101.6		P
Selenium	75 - 125	48.1388		0.6536	U	53.94	89.2		P
Silver	75 - 125	54.8909		0.2179	U	53.94	101.8		P
Sodium	75 - 125	1136.1430		217.8649	U	1078.75	105.3		P
Thallium	75 - 125	51.2300		0.6536	U	53.94	95.0		P
Vanadium	75 - 125	137.6273		27.1731		107.87	102.4		P
Zinc	75 - 125	131.6315		17.9635		107.87	105.4		P

Comments:

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB007 (7-8)SD

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Level (low/med): LOW

% Solids for Sample: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum		10469.3900		12556.2800		427.35	-488.3		P
Antimony	75 - 125	20.2272		1.0893	U	53.42	37.9	N	P
Arsenic	75 - 125	53.7396		4.2585		53.42	92.6		P
Barium	75 - 125	492.1291		48.6813		427.35	103.8		P
Beryllium	75 - 125	11.9280		0.7106	B	10.68	105.0		P
Cadmium	75 - 125	27.7307		0.2179	U	26.71	103.8		P
Calcium	75 - 125	1185.5450		217.8649	U	1068.38	111.0		P
Chromium	75 - 125	80.2414		30.1150		42.74	117.3		P
Cobalt	75 - 125	123.4460		10.3717		106.84	105.8		P
Copper	75 - 125	63.0842		6.2832		53.42	106.3		P
Iron		25516.4800		23474.4800		213.68	955.6		P
Lead	75 - 125	60.4640		4.4835		53.42	104.8		P
Magnesium	75 - 125	1409.0130		467.1917	B	1068.38	88.2		P
Manganese		690.7465		356.2969		106.84	313.0	N	P
Nickel	75 - 125	113.5474		10.0671		106.84	96.9		P
Potassium	75 - 125	1542.9080		548.5381	B	1068.38	93.1		P
Selenium	75 - 125	47.6111		0.6536	U	53.42	89.1		P
Silver	75 - 125	53.9786		0.2179	U	53.42	101.0		P
Sodium	75 - 125	1113.1480		217.8649	U	1068.38	104.2		P
Thallium	75 - 125	50.9790		0.6536	U	53.42	95.4		P
Vanadium	75 - 125	135.1875		27.1731		106.84	101.1		P
Zinc	75 - 125	126.1533		17.9635		106.84	101.3		P

Comments:

USEPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.

1034SB007 (7-8)A

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS _____ SDG No.: Radford003

Matrix (soil/water): SOLID Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added(SA)	%R	Q	M
Aluminum		59151.80		57633.31		2000.0	75.9		P
Antimony		239.06		5.00	U	250.0	95.6		P
Arsenic		284.39		19.55		250.0	105.9		P
Barium		2340.61		223.45		2000.0	105.9		P
Beryllium		58.67		3.26	B	50.0	110.8		P
Cadmium		136.24		1.00	U	125.0	109.0		P
Calcium		5968.19		1000.00	U	5000.0	119.4		P
Chromium		348.59		138.23		200.0	105.2		P
Cobalt		568.87		47.61		500.0	104.3		P
Copper		301.66		28.84		250.0	109.1		P
Iron		107274.80		107747.86		1000.0	-47.3		P
Lead		281.63		20.58		250.0	104.4		P
Magnesium		7252.75		2144.41	B	5000.0	102.2		P
Manganese		2148.11		1635.40		500.0	102.5		P
Nickel		565.32		46.21		500.0	103.8		P
Potassium		8434.06		2517.79	B	5000.0	118.3		P
Selenium		253.61		3.00	U	250.0	101.4		P
Silver		264.16		1.00	U	250.0	105.7		P
Sodium		5440.65		1000.00	U	5000.0	108.8		P
Thallium		246.63		3.00	U	250.0	98.7		P
Vanadium		641.49		124.72		500.0	103.4		P
Zinc		607.66		82.45		500.0	105.0		P

Comments: _____

6
DUPLICATES

SAMPLE NO.

1034SB007 (7-8)SD

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Matrix (soil/water): SOLID Level (low/med): LOW

% Solids for Sample: 90.0 % Solids for Duplicate: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		12533.4300		10469.3900		17.9		P
Antimony		18.2687		20.2272		10.2		P
Arsenic		52.0636		53.7396		3.2		P
Barium		485.2171		492.1291		1.4		P
Beryllium		12.2415		11.9280		2.6		P
Cadmium		27.9100		27.7307		0.6		P
Calcium		1324.9000		1185.5450		11.1		P
Chromium		68.3874		80.2414		16.0		P
Cobalt		121.1127		123.4460		1.9		P
Copper		63.3168		63.0842		0.4		P
Iron		22231.4700		25516.4800		13.8		P
Lead		60.0528		60.4640		0.7		P
Magnesium		1681.1950		1409.0130		17.6		P
Manganese		598.7615		690.7465		14.3		P
Nickel		116.4893		113.5474		2.6		P
Potassium		1644.3450		1542.9080		6.4		P
Selenium		48.1388		47.6111		1.1		P
Silver		54.8909		53.9786		1.7		P
Sodium		1136.1430		1113.1480		2.0		P
Thallium		51.2300		50.9790		0.5		P
Vanadium		137.6273		135.1875		1.8		P
Zinc		131.6316		126.1533		4.3		P

7
LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Solid LCS Source: HighPurity

Aqueous LCS Source: _____

	Aqueous (ug/L)			Solid (mg/kg)				
Analyte	True	Found	%R	True	Found	C	Limits	%R
Mercury				0.33	0.27		0.3 0.4	81.8

7
LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: Radford003

Solid LCS Source: HighPurity

Aqueous LCS Source: _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum				400.0	435.3		320.0	480.0	108.8
Antimony				50.0	48.7		40.0	60.0	97.4
Arsenic				50.0	49.0		40.0	60.0	98.0
Barium				400.0	395.1		320.0	480.0	98.8
Beryllium				10.0	10.4		8.0	12.0	104.0
Cadmium				25.0	25.4		20.0	30.0	101.6
Calcium				1000.0	973.1	B	800.0	1200.0	97.3
Chromium				40.0	39.8		32.0	48.0	99.5
Cobalt				100.0	97.2		80.0	120.0	97.2
Copper				50.0	49.8		40.0	60.0	99.6
Iron				200.0	209.9		160.0	240.0	105.0
Lead				50.0	49.8		40.0	60.0	99.6
Magnesium				1000.0	962.2	B	800.0	1200.0	96.2
Manganese				100.0	101.4		80.0	120.0	101.4
Nickel				100.0	97.0		80.0	120.0	97.0
Potassium				1000.0	1094.4		800.0	1200.0	109.4
Selenium				50.0	47.1		40.0	60.0	94.2
Silver				50.0	49.5		40.0	60.0	99.0
Sodium				1000.0	1014.4		800.0	1200.0	101.4
Thallium				50.0	46.1		40.0	60.0	92.2
Vanadium				100.0	97.3		80.0	120.0	97.3
Zinc				100.0	99.8		80.0	120.0	99.8

ORGANIC CASE NARRATIVE - PCBs
Arcadis - Radford
Workorder: 0806275

Date Sampled	Date Received	Lab ID	Client ID
25-Jun-2008	26-Jun-2008	0806275-01	1041015 (12-12.5)
25-Jun-2008	26-Jun-2008	0806275-02	1041015 (18-18.5)
25-Jun-2008	26-Jun-2008	0806275-03	1041006 (0.5-1)
25-Jun-2008	26-Jun-2008	0806275-04	1041007 (0.5-1)
25-Jun-2008	26-Jun-2008	0806275-05	1041008 (0.5-1)

Method: The samples were extracted/analyzed by USEPA SW-846 Method 3541/8082 (automated soxhlet extraction followed by dual capillary column GC/ECD) for soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Note: Samples 1041015 (12-12.5) and 1041015 (18-18.5) were received for VOA extract and hold. E-mail documentation canceling these analyses is attached.
- Calibration Criteria: All method calibration criteria were met.
- Blank Results: No target analytes were detected.
- Surrogate Recoveries: All recoveries were within limits.
- LCS Results: All recoveries were within limits.
- MS/MSD results: Not applicable.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

(soil)

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Project Number/Name GP08RAAP.0047.DF000 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck (410-987-0032)

Sampler(s)/Affiliation MC, SG / ARCADIS

806275

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs (8260) encore	Moisture Content none	PCBs (8082) 4oz glass jar	PCBs (8082) none	PCBs (8082) 4oz glass jar				Remarks	Total
-01 104|019(12-12.5)	SO	6/25/08 13:10		X	X	Cancelled per client 2/2						⊗extract and hold	4
-02 104|015(18-18.5)	SO	6/25/08 13:30		X	X	cancelled per client 2/2						⊗extract and hold	4
-03 104|006(0.5-1)	SO	6/25/08 16:25				X							1
-04 104|007 (0.5-1)	SO	6/25/08 16:55				X							1
-05 104|008 (0.5-1)	SO	6/25/08 16:30				X							1

Total No. of Bottles/Containers: 11

Sample Matrix: L = Liquid; S = Solid; A = Air SO=soil

2.70C

Relinquished by: Sandra Grabarczyk	Organization: ARCADIS	Date 6/25/08	Time 17:50	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: Empirical	Date 6/26/08	Time 09:00	Yes	No N/A

Special Instructions/Remarks: ⊗ Please contact w/ questions

Delivery Method: ☐ In Person ☒ Common Carrier Fed EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

Renee Vogel

From: Marcia McGinnity [MMcGinnity@EmpirLabs.com]
Sent: Wednesday, July 02, 2008 10:48 AM
To: eoverby@empirlabs.com; wschwab@empirlabs.com; Antonio Monteiro
Cc: RVogel@EmpirLabs.com; 'Kennedy, Jane'
Subject: FW: Hold Samples in 0806275
Importance: High

EJ/Will - please reflect this in the login for 0806275. Renee - please reflect on the original COC.

Thanks,
Marcia
-----Original Message-----
From: Kennedy, Jane [mailto:Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, July 02, 2008 10:39 AM
To: 'Marcia McGinnity'; RVogel@EmpirLabs.com
Cc: Powell, Jace'que; Sharpe, Christopher; Wisbeck, Diane; Borne, Rachelle
Subject: Hold Samples in 0806275
Importance: High

Hi Marcia and Renee

The 2 soils listed for VOCs "extract and hold" should be cancelled. We don't need the data for these

1041015(12-1205)

1041015(18-18.5)

Please let me know if you have any questions

Thanks
jane

Jane Kennedy
Principal Scientist
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EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0806275 COC ID(s): 062508-2 (soil)

Client Arcadis Project Radford

Sample Custodian WS Today's Date 6/26/08

Date/Time Samples Received 6/26/08 09:00

Airbill Number Fedex

Cooler Opened: Date 6/26/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 6/25/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓

Frozen _____

# of Coolers 1 Temp. of Coolers 2.7°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

Marcia McGinnity

From: Kennedy, Jane [Jane.Kennedy@arcadis-us.com]
Sent: Wednesday, July 02, 2008 10:39 AM
To: 'Marcia McGinnity'; RVogel@EmpirLabs.com
Cc: Powell, Jace'que; Sharpe, Christopher; Wisbeck, Diane; Borne, Rachelle
Subject: Hold Samples in 0806275
Importance: High

Hi Marcia and Renee

The 2 soils listed for VOCs "extract and hold" should be cancelled. We don't need the data for these

041015(12-1205)

041015(18-18.5)

Please let me know if you have any questions

Thanks
Jane

Jane Kennedy
Principal Scientist
ARCADIS US, Inc.
850 N. Causeway Blvd.
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FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041006 (0.5-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P06275

Matrix: (soil/water) SOIL Lab Sample ID: 0806275-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 033F3301

% Moisture: 18 decanted: (Y/N) N Date Sampled: 06/25/08 16:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/27/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/28/08 16:33

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.1	20		U
11104-28-2	PCB-1221	5.1	20		U
11141-16-5	PCB-1232	5.1	20		U
53469-21-9	PCB-1242	5.1	20		U
12672-29-6	PCB-1248	5.1	20		U
11097-69-1	PCB-1254	5.1	20		U
11096-82-5	PCB-1260	5.1	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041007 (0.5-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P06275

Matrix: (soil/water) SOIL Lab Sample ID: 0806275-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 034F3401

% Moisture: 19 decanted: (Y/N) N Date Sampled: 06/25/08 16:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/27/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/28/08 16:52

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	5.1	20		U
11104-28-2	PCB-1221	5.1	20		U
11141-16-5	PCB-1232	5.1	20		U
53469-21-9	PCB-1242	5.1	20		U
12672-29-6	PCB-1248	5.1	20		U
11097-69-1	PCB-1254	5.1	20		U
11096-82-5	PCB-1260	5.1	20		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041008 (0.5-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P06275

Matrix: (soil/water) SOIL Lab Sample ID: 0806275-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 035F3501

% Moisture: 15 decanted: (Y/N) N Date Sampled: 06/25/08 16:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/27/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/28/08 17:10

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.9	20		U
11104-28-2	PCB-1221	4.9	20		U
11141-16-5	PCB-1232	4.9	20		U
53469-21-9	PCB-1242	4.9	20		U
12672-29-6	PCB-1248	4.9	20		U
11097-69-1	PCB-1254	4.9	20		U
11096-82-5	PCB-1260	4.9	20		U

FORM 2
SOIL PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P06275

Column(1): ZB MR-1 ID: 0.32 (mm) Column(2): ZB MR-2 ID: 0.32 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PS1BLK0627	80	78	96	103			0
02	PS1BLK0627LC	79	76	95	101			0
03	PS1BLK0627LC	77	73	96	102			0
04	1041006 (0.5	76	76	90	97			0
05	1041007 (0.5	74	75	75	96			0
06	1041008 (0.5	81	80	88	98			0
07								
08								
09								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		EL QC LIMITS	SPIKE CONC (ug/Kg)
S1	= TCMX	(30-120)	17
S2	= DCB	(35-140)	17

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
SOIL PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P06275

Matrix Spike - Client Sample No.: PS1BLK0627

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PCB-1016	166.7	0.0000	156.9	94	45-120
PCB-1260	166.7	0.0000	162.9	98	40-125

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	166.7	148.9	89	5	50	45-120
PCB-1260	166.7	158.4	95	3	50	40-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

8 Revised 7/25/05

FORM 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PS1BLK0627

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P06275

Lab Sample ID: PS1BLK0627 Lab File ID: 025F2501PCB

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SOXH

Sulfur Cleanup (Y/N) N Date Extracted: 06/27/08

Date Analyzed (1): 06/28/08 Date Analyzed (2): 06/28/08

Time Analyzed (1): 1405 Time Analyzed (2): 1405

Instrument ID (1): ECD3 Instrument ID (2): ECD3

Column (1): ZB MR-1 ID: 0.32(mm) Column (2): ZB MR-2 ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PS1BLK0627LC	PS1BLK0627LCS	06/28/08	06/28/08
02	PS1BLK0627LC	PS1BLK0627LCSD	06/28/08	06/28/08
03	1041006 (0.5	0806275-03	06/28/08	06/28/08
04	1041007 (0.5	0806275-04	06/28/08	06/28/08
05	1041008 (0.5	0806275-05	06/28/08	06/28/08
06				
07				
08				
09				
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11				
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17				
18				
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22				
23				
24				
25				
26				

COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PS1BLK0627

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P06275

Matrix: (soil/water) SOIL Lab Sample ID: PS1BLK0627

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 025F2501PCB

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/27/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 06/28/08 14:05

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
12674-11-2	PCB-1016	4.2	17		U
11104-28-2	PCB-1221	4.2	17		U
11141-16-5	PCB-1232	4.2	17		U
53469-21-9	PCB-1242	4.2	17		U
12672-29-6	PCB-1248	4.2	17		U
11097-69-1	PCB-1254	4.2	17		U
11096-82-5	PCB-1260	4.2	17		U

ORGANIC CASE NARRATIVE - VOLATILES
Arcadis – Radford - 0806303

Date Sampled	Date Received	Lab ID	Client ID
26-Jun-2008	27-Jun-2008	0806303-01	1041SB011(8-9)
26-Jun-2008	27-Jun-2008	0806303-02	1041DUP001(8-9)
26-Jun-2008	27-Jun-2008	0806303-03	1041SB009(7-8)
26-Jun-2008	27-Jun-2008	0806303-04	1041SB010(7-8)
26-Jun-2008	27-Jun-2008	0806303-05	1041SB014(6-7)

Method: The samples were extracted/analyzed for client specified analyte lists by 5035/8260B (encore field sampling with laboratory preservation then purge and trap followed by capillary column GC/MS) for soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- BFB Tuning: All method tuning criteria were met.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded in the calibration verification standard for 1,4-dioxane which exceeded with a negative bias of 33%. Results in the associated samples are qualified with a "Y" for a potential negative bias.
- Method Blank Results: Cyclohexane, methylene chloride and toluene were detected in the method. Reported concentrations in the associated sample are qualified with a "B".
- Surrogate Recoveries: All recoveries were within limits.
- LCS results: All recoveries were within limits.
- MS/MSD results: Not applicable.
- Internal Standard Area Counts: All internal standard area counts were within limits.
- Dilutions: Not applicable.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name GP08RAAP.0047.DF000

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation MC, SG / AREADS

0806303

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOCs 8260 encores	Moisture none	none 4oz jar					Remarks	Total
-01	1041SB011(8-9)	SO	6/26/08 15:10		X	X							4
-02	1041DUP001(8-9)	SO	6/26/08 15:10		X	X							4
-03	1041SB009(7-8)	SO	6/26/08 15:25		X	X							4
-04	1041SB010(7-8)	SO	6/26/08 15:45		X	X							4
-05	1041SB014(6-7)	SO	6/26/08 16:10		X	X							4

Sample Matrix: L = Liquid; S = Solid; A = Air SO = Soil

4.9°C

Total No. of Bottles/Containers 20

Relinquished by: Sandra Grabowski	Organization: AREADS	Date 6/26/08	Time 18:00	Seal Intact?		
Received by:	Organization:	Date / /	Time	Yes	No	N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?		
Received by:	Organization: Empirical Labs	Date 6/27/08	Time 1145	(Yes)	No	N/A

Special Instructions/Remarks: (1) Please contact with any questions

Delivery Method: ☐ In Person ☒ Common Carrier Fed EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0806303 COC ID(s): 062608-1

Client Arcadis Project Radford

Sample Custodian WS Today's Date 6/27/08

Date/Time Samples Received 6/27/08 11:45
Airbill Number Fedex
Cooler Opened: Date 6/27/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 6/26/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 1 Temp. of Coolers 4.9°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB011(8-9)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-01

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 0630301A

Level: (low/med) LOW Date Sampled: 06/26/08 15:10

% Moisture: not dec. 28 Date Analyzed: 07/02/08 11:14

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.8	14		U
71-43-2	Benzene	0.65	7.0		U
74-97-5	Bromochloromethane	0.58	7.0		U
75-27-4	Bromodichloromethane	0.42	7.0		U
75-25-2	Bromoform	1.4	7.0		U
74-83-9	Bromomethane	1.0	7.0		U
78-93-3	2-Butanone	1.9	14		U
75-15-0	Carbon disulfide	1.8	7.0		U
56-23-5	Carbon tetrachloride	1.2	7.0		U
108-90-7	Chlorobenzene	0.47	7.0		U
75-00-3	Chloroethane	1.5	7.0		U
67-66-3	Chloroform	0.76	7.0		U
74-87-3	Chloromethane	0.72	7.0		U
110-82-7	Cyclohexane	0.75	7.0		U
124-48-1	Dibromochloromethane	0.47	7.0		U
96-12-8	1,2-Dibromo-3-chloropropane	1.7	7.0		U
106-93-4	1,2-Dibromoethane	0.60	7.0		U
95-50-1	1,2-Dichlorobenzene	0.51	7.0		U
541-73-1	1,3-Dichlorobenzene	1.2	7.0		U
106-46-7	1,4-Dichlorobenzene	0.76	7.0		U
75-71-8	Dichlorodifluoromethane	1.5	7.0		U
75-34-3	1,1-Dichloroethane	0.75	7.0		U
107-06-2	1,2-Dichloroethane	0.64	7.0		U
75-35-4	1,1-Dichloroethene	1.7	7.0		U
156-59-2	cis-1,2-Dichloroethene	1.7	7.0		U
156-60-5	trans-1,2-Dichloroethene	1.5	7.0		U
78-87-5	1,2-Dichloropropane	0.64	7.0		U
10061-01-5	cis-1,3-Dichloropropene	0.70	7.0		U
10061-02-6	trans-1,3-Dichloropropene	0.44	7.0		U
123-91-1	1,4-Dioxane	0.70	70	7/8/08	U Y
100-41-4	Ethylbenzene	1.0	7.0		U
591-78-6	2-Hexanone	3.2	14		U
98-82-8	Isopropylbenzene	1.2	7.0		U
79-20-9	Methyl acetate	2.2	7.0		U
108-87-2	Methyl cyclohexane	0.42	7.0		U
75-09-2	Methylene chloride	0.86	7.0	15	B
108-10-1	4-Methyl-2-pentanone	0.81	14		U
1634-04-4	Methyl-tert-butyl ether	0.44	7.0		U
100-42-5	Styrene	0.49	7.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB011(8-9)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-01

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 0630301A

Level: (low/med) LOW Date Sampled: 06/26/08 15:10

% Moisture: not dec. 28 Date Analyzed: 07/02/08 11:14

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.60	7.0		U
127-18-4	Tetrachloroethene	1.3	7.0		U
108-88-3	Toluene	1.2	7.0		U
87-61-6	1,2,3-Trichlorobenzene	0.58	7.0		U
120-82-1	1,2,4-Trichlorobenzene	0.25	7.0		U
71-55-6	1,1,1-Trichloroethane	1.2	7.0		U
79-00-5	1,1,2-Trichloroethane	0.49	7.0		U
79-01-6	Trichloroethene	1.2	7.0		U
76-13-1	Trichlorotrifluoroethane	0.76	7.0		U
75-69-4	Trichlorofluoromethane	1.3	7.0		U
75-01-4	Vinyl chloride	1.5	7.0		U
1330-20-7	Xylene(total)	0.97	7.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041DUP001(8-9)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-02

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 0630302A

Level: (low/med) LOW Date Sampled: 06/26/08 15:10

% Moisture: not dec. 30 Date Analyzed: 07/02/08 11:53

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.8	14		U
71-43-2	Benzene	0.66	7.0		U
74-97-5	Bromochloromethane	0.59	7.0		U
75-27-4	Bromodichloromethane	0.42	7.0		U
75-25-2	Bromoform	1.4	7.0		U
74-83-9	Bromomethane	1.0	7.0		U
78-93-3	2-Butanone	2.0	14		U
75-15-0	Carbon disulfide	1.8	7.0		U
56-23-5	Carbon tetrachloride	1.2	7.0		U
108-90-7	Chlorobenzene	0.48	7.0		U
75-00-3	Chloroethane	1.5	7.0		U
67-66-3	Chloroform	0.77	7.0		U
74-87-3	Chloromethane	0.73	7.0		U
110-82-7	Cyclohexane	0.76	7.0		U
124-48-1	Dibromochloromethane	0.48	7.0		U
96-12-8	1,2-Dibromo-3-chloropropane	1.7	7.0		U
106-93-4	1,2-Dibromoethane	0.60	7.0		U
95-50-1	1,2-Dichlorobenzene	0.52	7.0		U
541-73-1	1,3-Dichlorobenzene	1.2	7.0		U
106-46-7	1,4-Dichlorobenzene	0.77	7.0		U
75-71-8	Dichlorodifluoromethane	1.5	7.0		U
75-34-3	1,1-Dichloroethane	0.76	7.0		U
107-06-2	1,2-Dichloroethane	0.64	7.0		U
75-35-4	1,1-Dichloroethene	1.7	7.0		U
156-59-2	cis-1,2-Dichloroethene	1.7	7.0		U
156-60-5	trans-1,2-Dichloroethene	1.5	7.0		U
78-87-5	1,2-Dichloropropane	0.64	7.0		U
10061-01-5	cis-1,3-Dichloropropene	0.70	7.0		U
10061-02-6	trans-1,3-Dichloropropene	0.45	7.0		U
123-91-1	1,4-Dioxane	0.70	70	7/28/09	UJ
100-41-4	Ethylbenzene	1.0	7.0		U
591-78-6	2-Hexanone	3.2	14		U
98-82-8	Isopropylbenzene	1.2	7.0		U
79-20-9	Methyl acetate	2.2	7.0		U
108-87-2	Methyl cyclohexane	0.42	7.0		U
75-09-2	Methylene chloride	0.87	7.0	11	B
108-10-1	4-Methyl-2-pentanone	0.81	14		U
1634-04-4	Methyl-tert-butyl ether	0.45	7.0		U
100-42-5	Styrene	0.49	7.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041DUP001(8-9)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-02

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 0630302A

Level: (low/med) LOW Date Sampled: 06/26/08 15:10

% Moisture: not dec. 30 Date Analyzed: 07/02/08 11:53

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.60	7.0		U
127-18-4	Tetrachloroethene	1.4	7.0		U
108-88-3	Toluene	1.2	7.0		U
87-61-6	1,2,3-Trichlorobenzene	0.59	7.0		U
120-82-1	1,2,4-Trichlorobenzene	0.25	7.0		U
71-55-6	1,1,1-Trichloroethane	1.3	7.0		U
79-00-5	1,1,2-Trichloroethane	0.49	7.0		U
79-01-6	Trichloroethene	1.2	7.0		U
76-13-1	Trichlorotrifluoroethane	0.77	7.0		U
75-69-4	Trichlorofluoromethane	1.3	7.0		U
75-01-4	Vinyl chloride	1.5	7.0		U
1330-20-7	Xylene(total)	0.98	7.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB009(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-03

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0630303A

Level: (low/med) LOW Date Sampled: 06/26/08 15:25

% Moisture: not dec. 30 Date Analyzed: 07/02/08 12:33

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.7	14		U
71-43-2	Benzene	0.64	6.9		U
74-97-5	Bromochloromethane	0.58	6.9		U
75-27-4	Bromodichloromethane	0.41	6.9		U
75-25-2	Bromoform	1.4	6.9		U
74-83-9	Bromomethane	0.99	6.9		U
78-93-3	2-Butanone	1.9	14		U
75-15-0	Carbon disulfide	1.8	6.9		U
56-23-5	Carbon tetrachloride	1.2	6.9		U
108-90-7	Chlorobenzene	0.47	6.9		U
75-00-3	Chloroethane	1.5	6.9		U
67-66-3	Chloroform	0.76	6.9		U
74-87-3	Chloromethane	0.71	6.9		U
110-82-7	Cyclohexane	0.74	6.9		U
124-48-1	Dibromochloromethane	0.47	6.9		U
96-12-8	1,2-Dibromo-3-chloropropane	1.6	6.9		U
106-93-4	1,2-Dibromoethane	0.59	6.9		U
95-50-1	1,2-Dichlorobenzene	0.51	6.9		U
541-73-1	1,3-Dichlorobenzene	1.2	6.9		U
106-46-7	1,4-Dichlorobenzene	0.76	6.9		U
75-71-8	Dichlorodifluoromethane	1.5	6.9		U
75-34-3	1,1-Dichloroethane	0.74	6.9		U
107-06-2	1,2-Dichloroethane	0.63	6.9		U
75-35-4	1,1-Dichloroethene	1.6	6.9		U
156-59-2	cis-1,2-Dichloroethene	1.6	6.9		U
156-60-5	trans-1,2-Dichloroethene	1.5	6.9		U
78-87-5	1,2-Dichloropropane	0.63	6.9		U
10061-01-5	cis-1,3-Dichloropropene	0.69	6.9		U
10061-02-6	trans-1,3-Dichloropropene	0.44	6.9		U
123-91-1	1,4-Dioxane	0.69	69		U Y
100-41-4	Ethylbenzene	1.0	6.9	~2/1563	U
591-78-6	2-Hexanone	3.2	14		U
98-82-8	Isopropylbenzene	1.2	6.9		U
79-20-9	Methyl acetate	2.2	6.9		U
108-87-2	Methyl cyclohexane	0.41	6.9		U
75-09-2	Methylene chloride	0.85	6.9	12	B
108-10-1	4-Methyl-2-pentanone	0.80	14		U
1634-04-4	Methyl-tert-butyl ether	0.44	6.9		U
100-42-5	Styrene	0.48	6.9		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB009(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-03

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0630303A

Level: (low/med) LOW Date Sampled: 06/26/08 15:25

% Moisture: not dec. 30 Date Analyzed: 07/02/08 12:33

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.59	6.9		U
127-18-4	Tetrachloroethene	1.3	6.9		U
108-88-3	Toluene	1.2	6.9		U
87-61-6	1,2,3-Trichlorobenzene	0.58	6.9		U
120-82-1	1,2,4-Trichlorobenzene	0.25	6.9		U
71-55-6	1,1,1-Trichloroethane	1.2	6.9		U
79-00-5	1,1,2-Trichloroethane	0.48	6.9		U
79-01-6	Trichloroethene	1.2	6.9		U
76-13-1	Trichlorotrifluoroethane	0.76	6.9		U
75-69-4	Trichlorofluoromethane	1.3	6.9		U
75-01-4	Vinyl chloride	1.5	6.9		U
1330-20-7	Xylene(total)	0.96	6.9		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB010(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-04

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0630304A

Level: (low/med) LOW Date Sampled: 06/26/08 15:45

% Moisture: not dec. 29 Date Analyzed: 07/02/08 13:12

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.9	14		U
71-43-2	Benzene	0.68	7.2		U
74-97-5	Bromochloromethane	0.61	7.2		U
75-27-4	Bromodichloromethane	0.43	7.2		U
75-25-2	Bromoform	1.4	7.2		U
74-83-9	Bromomethane	1.0	7.2		U
78-93-3	2-Butanone	2.0	14		U
75-15-0	Carbon disulfide	1.9	7.2		U
56-23-5	Carbon tetrachloride	1.3	7.2		U
108-90-7	Chlorobenzene	0.49	7.2		U
75-00-3	Chloroethane	1.6	7.2		U
67-66-3	Chloroform	0.79	7.2		U
74-87-3	Chloromethane	0.75	7.2		U
110-82-7	Cyclohexane	0.78	7.2		U
124-48-1	Dibromochloromethane	0.49	7.2		U
96-12-8	1,2-Dibromo-3-chloropropane	1.7	7.2		U
106-93-4	1,2-Dibromoethane	0.62	7.2		U
95-50-1	1,2-Dichlorobenzene	0.53	7.2		U
541-73-1	1,3-Dichlorobenzene	1.2	7.2		U
106-46-7	1,4-Dichlorobenzene	0.79	7.2		U
75-71-8	Dichlorodifluoromethane	1.6	7.2		U
75-34-3	1,1-Dichloroethane	0.78	7.2		U
107-06-2	1,2-Dichloroethane	0.66	7.2		U
75-35-4	1,1-Dichloroethene	1.7	7.2		U
156-59-2	cis-1,2-Dichloroethene	1.7	7.2		U
156-60-5	trans-1,2-Dichloroethene	1.6	7.2		U
78-87-5	1,2-Dichloropropane	0.66	7.2		U
10061-01-5	cis-1,3-Dichloropropene	0.72	7.2		U
10061-02-6	trans-1,3-Dichloropropene	0.46	7.2		U
123-91-1	1,4-Dioxane	0.72	72		U
100-41-4	Ethylbenzene	1.1	7.2		U
591-78-6	2-Hexanone	3.3	14		U
98-82-8	Isopropylbenzene	1.3	7.2		U
79-20-9	Methyl acetate	2.3	7.2		U
108-87-2	Methyl cyclohexane	0.43	7.2		U
75-09-2	Methylene chloride	0.89	7.2	11	B
108-10-1	4-Methyl-2-pentanone	0.84	14		U
1634-04-4	Methyl-tert-butyl ether	0.46	7.2		U
100-42-5	Styrene	0.50	7.2		U

Y

~7/3/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB010(7-8)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-04

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0630304A

Level: (low/med) LOW Date Sampled: 06/26/08 15:45

% Moisture: not dec. 29 Date Analyzed: 07/02/08 13:12

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.62	7.2		U
127-18-4	Tetrachloroethene	1.4	7.2		U
108-88-3	Toluene	1.2	7.2		U
87-61-6	1,2,3-Trichlorobenzene	0.61	7.2		U
120-82-1	1,2,4-Trichlorobenzene	0.26	7.2		U
71-55-6	1,1,1-Trichloroethane	1.3	7.2		U
79-00-5	1,1,2-Trichloroethane	0.50	7.2		U
79-01-6	Trichloroethene	1.2	7.2		U
76-13-1	Trichlorotrifluoroethane	0.79	7.2		U
75-69-4	Trichlorofluoromethane	1.4	7.2		U
75-01-4	Vinyl chloride	1.6	7.2		U
1330-20-7	Xylene(total)	1.0	7.2		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB014(6-7)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-05

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0630305A

Level: (low/med) LOW Date Sampled: 06/26/08 16:10

% Moisture: not dec. 30 Date Analyzed: 07/02/08 13:52

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.7	14		U
71-43-2	Benzene	0.64	6.8		U
74-97-5	Bromochloromethane	0.58	6.8		U
75-27-4	Bromodichloromethane	0.41	6.8		U
75-25-2	Bromoform	1.4	6.8		U
74-83-9	Bromomethane	0.99	6.8		U
78-93-3	2-Butanone	1.9	14		U
75-15-0	Carbon disulfide	1.8	6.8		U
56-23-5	Carbon tetrachloride	1.2	6.8		U
108-90-7	Chlorobenzene	0.47	6.8		U
75-00-3	Chloroethane	1.5	6.8		U
67-66-3	Chloroform	0.75	6.8		U
74-87-3	Chloromethane	0.71	6.8		U
110-82-7	Cyclohexane	0.74	6.8		U
124-48-1	Dibromochloromethane	0.47	6.8		U
96-12-8	1,2-Dibromo-3-chloropropane	1.6	6.8		U
106-93-4	1,2-Dibromoethane	0.59	6.8		U
95-50-1	1,2-Dichlorobenzene	0.51	6.8		U
541-73-1	1,3-Dichlorobenzene	1.2	6.8		U
106-46-7	1,4-Dichlorobenzene	0.75	6.8		U
75-71-8	Dichlorodifluoromethane	1.5	6.8		U
75-34-3	1,1-Dichloroethane	0.74	6.8		U
107-06-2	1,2-Dichloroethane	0.63	6.8		U
75-35-4	1,1-Dichloroethene	1.6	6.8		U
156-59-2	cis-1,2-Dichloroethene	1.6	6.8		U
156-60-5	trans-1,2-Dichloroethene	1.5	6.8		U
78-87-5	1,2-Dichloropropane	0.63	6.8		U
10061-01-5	cis-1,3-Dichloropropene	0.68	6.8		U
10061-02-6	trans-1,3-Dichloropropene	0.44	6.8		U
123-91-1	1,4-Dioxane	0.68	68		U Y
100-41-4	Ethylbenzene	1.0	6.8		U
591-78-6	2-Hexanone	3.2	14		U
98-82-8	Isopropylbenzene	1.2	6.8		U
79-20-9	Methyl acetate	2.2	6.8		U
108-87-2	Methyl cyclohexane	0.41	6.8		U
75-09-2	Methylene chloride	0.85	6.8	9.8	B
108-10-1	4-Methyl-2-pentanone	0.80	14		U
1634-04-4	Methyl-tert-butyl ether	0.44	6.8		U
100-42-5	Styrene	0.48	6.8		U

7/3/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB014(6-7)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: 0806303-05

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0630305A

Level: (low/med) LOW Date Sampled: 06/26/08 16:10

% Moisture: not dec. 30 Date Analyzed: 07/02/08 13:52

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.59	6.8		U
127-18-4	Tetrachloroethene	1.3	6.8		U
108-88-3	Toluene	1.2	6.8		U
87-61-6	1,2,3-Trichlorobenzene	0.58	6.8		U
120-82-1	1,2,4-Trichlorobenzene	0.25	6.8		U
71-55-6	1,1,1-Trichloroethane	1.2	6.8		U
79-00-5	1,1,2-Trichloroethane	0.48	6.8		U
79-01-6	Trichloroethene	1.2	6.8		U
76-13-1	Trichlorotrifluoroethane	0.75	6.8		U
75-69-4	Trichlorofluoromethane	1.3	6.8		U
75-01-4	Vinyl chloride	1.5	6.8		U
1330-20-7	Xylene(total)	0.96	6.8		U

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Level:(low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V1BLK0702LCS	97	96	98	100	0
02	V1BLK0702	106	102	100	100	0
03	1041SB011(8-	103	109	99	98	0
04	1041DUP001(8	108	106	98	100	0
05	1041SB009(7-	105	102	100	101	0
06	1041SB010(7-	102	98	98	97	0
07	1041SB014(6-	108	106	99	100	0
08						
09						
10						
11						
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27						
28						
29						
30						

		EL QC LIMITS	SPIKE CONC (ug/Kg)
SMC1 (DFM)	= Dibromofluoromethane	(80-125)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(75-140)	30
SMC3 (TOL)	= Toluene-d8	(80-120)	30
SMC4 (BFB)	= Bromofluorobenzene	(80-125)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix Spike - Client Sample No.: V1BLK0702 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	90.40	90	20-160
Benzene	50.00	0.0000	50.83	102	75-125
Bromochloromethane	50.00	0.0000	51.84	104	70-125
Bromodichloromethane	50.00	0.0000	50.21	100	70-130
Bromoform	50.00	0.0000	53.78	108	55-135
Bromomethane	50.00	0.0000	44.23	88	30-160
2-Butanone	100.0	0.0000	97.56	98	30-160
Carbon disulfide	50.00	0.0000	49.46	99	45-160
Carbon tetrachloride	50.00	0.0000	50.90	102	65-135
Chlorobenzene	50.00	0.0000	50.21	100	75-125
Chloroethane	50.00	0.0000	50.41	101	40-155
Chloroform	50.00	0.0000	51.16	102	70-125
Chloromethane	50.00	0.0000	52.76	106	50-130
Cyclohexane	50.00	0.8143	49.34	97	65-140
Dibromochloromethane	50.00	0.0000	52.07	104	65-130
1,2-Dibromo-3-chloropro	50.00	0.0000	47.40	95	40-135
1,2-Dibromoethane	50.00	0.0000	50.24	100	70-125
1,2-Dichlorobenzene	50.00	0.0000	50.74	101	75-120
1,3-Dichlorobenzene	50.00	0.0000	50.91	102	70-125
1,4-Dichlorobenzene	50.00	0.0000	48.37	97	70-125
Dichlorodifluoromethane	50.00	0.0000	51.52	103	35-135
1,1-Dichloroethane	50.00	0.0000	50.46	101	75-125
1,2-Dichloroethane	50.00	0.0000	51.67	103	70-125
1,1-Dichloroethene	50.00	0.0000	47.37	95	65-135
cis-1,2-Dichloroethene	50.00	0.0000	50.40	101	65-125
trans-1,2-Dichloroethen	50.00	0.0000	48.43	97	65-135
1,2-Dichloropropane	50.00	0.0000	50.66	101	70-120
cis-1,3-Dichloropropene	50.00	0.0000	52.48	105	70-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix Spike - Client Sample No.: V1BLK0702 Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	51.49	103	65-125
1,4-Dioxane	1000	0.0000	754.8	75	50-150
Ethylbenzene	50.00	0.0000	49.53	99	75-125
2-Hexanone	100.0	0.0000	103.2	103	45-145
Isopropylbenzene	50.00	0.0000	50.12	100	75-130
Methyl acetate	50.00	0.0000	50.44	101	45-265
Methyl cyclohexane	50.00	0.0000	51.24	102	65-135
Methylene chloride	50.00	8.620	43.18	69	55-140
4-Methyl-2-pentanone	100.0	0.0000	100.6	101	45-145
Methyl-tert-butyl ether	50.00	0.0000	49.48	99	55-150
Styrene	50.00	0.0000	50.48	101	75-125
1,1,2,2-Tetrachloroetha	50.00	0.0000	50.36	101	55-130
Tetrachloroethene	55.00	0.0000	54.94	100	65-140
Toluene	50.00	0.8783	48.15	94	70-125
1,2,3-Trichlorobenzene	50.00	0.0000	50.19	100	60-135
1,2,4-Trichlorobenzene	50.00	0.0000	49.00	98	65-130
1,1,1-Trichloroethane	50.00	0.0000	48.97	98	70-135
1,1,2-Trichloroethane	50.00	0.0000	51.22	102	60-125
Trichloroethene	50.00	0.0000	51.33	103	75-125
Trichlorotrifluoroethan	50.00	0.0000	50.73	101	60-140
Trichlorofluoromethane	50.00	0.0000	48.85	98	25-185
Vinyl chloride	50.00	0.0000	49.64	99	60-125
Xylene(total)	150.0	0.0000	144.5	96	70-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 51 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V1BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Lab File ID: V1PBLK01 Lab Sample ID: V1BLK0702

Date Analyzed: 07/02/08 Time Analyzed: 0955

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

Instrument ID: VOA1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V1BLK0702LCS	V1BLK0702LCS	V1LCS01	0836
02	1041SB011(8-	0806303-01	0630301A	1114
03	1041DUP001(8	0806303-02	0630302A	1153
04	1041SB009(7-	0806303-03	0630303A	1233
05	1041SB010(7-	0806303-04	0630304A	1312
06	1041SB014(6-	0806303-05	0630305A	1352
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0702

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1PBLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 07/02/08 09:55

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.0	10		U
71-43-2	Benzene	0.47	5.0		U
74-97-5	Bromochloromethane	0.42	5.0		U
75-27-4	Bromodichloromethane	0.30	5.0		U
75-25-2	Bromoform	1.0	5.0		U
74-83-9	Bromomethane	0.72	5.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	1.3	5.0		U
56-23-5	Carbon tetrachloride	0.88	5.0		U
108-90-7	Chlorobenzene	0.34	5.0		U
75-00-3	Chloroethane	1.1	5.0		U
67-66-3	Chloroform	0.55	5.0		U
74-87-3	Chloromethane	0.52	5.0		U
110-82-7	Cyclohexane	0.54	5.0	0.81	J
124-48-1	Dibromochloromethane	0.34	5.0		U
96-12-8	1,2-Dibromo-3-chloropropane	1.2	5.0		U
106-93-4	1,2-Dibromoethane	0.43	5.0		U
95-50-1	1,2-Dichlorobenzene	0.37	5.0		U
541-73-1	1,3-Dichlorobenzene	0.84	5.0		U
106-46-7	1,4-Dichlorobenzene	0.55	5.0		U
75-71-8	Dichlorodifluoromethane	1.1	5.0		U
75-34-3	1,1-Dichloroethane	0.54	5.0		U
107-06-2	1,2-Dichloroethane	0.46	5.0		U
75-35-4	1,1-Dichloroethene	1.2	5.0		U
156-59-2	cis-1,2-Dichloroethene	1.2	5.0		U
156-60-5	trans-1,2-Dichloroethene	1.1	5.0		U
78-87-5	1,2-Dichloropropane	0.46	5.0		U
10061-01-5	cis-1,3-Dichloropropene	0.50	5.0		U
10061-02-6	trans-1,3-Dichloropropene	0.32	5.0		U
123-91-1	1,4-Dioxane	0.50	50		U
100-41-4	Ethylbenzene	0.75	5.0		U
591-78-6	2-Hexanone	2.3	10		U
98-82-8	Isopropylbenzene	0.88	5.0		U
79-20-9	Methyl acetate	1.6	5.0		U
108-87-2	Methyl cyclohexane	0.30	5.0		U
75-09-2	Methylene chloride	0.62	5.0	8.6	
108-10-1	4-Methyl-2-pentanone	0.58	10		U
1634-04-4	Methyl-tert-butyl ether	0.32	5.0		U
100-42-5	Styrene	0.35	5.0		U

7/8/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0702

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1PBLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 07/02/08 09:55

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.43	5.0		U
127-18-4	Tetrachloroethene	0.97	5.0		U
108-88-3	Toluene	0.86	5.0	0.88	J
87-61-6	1,2,3-Trichlorobenzene	0.42	5.0		U
120-82-1	1,2,4-Trichlorobenzene	0.18	5.0		U
71-55-6	1,1,1-Trichloroethane	0.90	5.0		U
79-00-5	1,1,2-Trichloroethane	0.35	5.0		U
79-01-6	Trichloroethene	0.85	5.0		U
76-13-1	Trichlorotrifluoroethane	0.55	5.0		U
75-69-4	Trichlorofluoromethane	0.95	5.0		U
75-01-4	Vinyl chloride	1.1	5.0		U
1330-20-7	Xylene(total)	0.70	5.0		U

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA88279

Lab File ID: V1BFB01 BFB Injection Date: 02/15/08

Instrument ID: VOA1 BFB Injection Time: 0954

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.6
75	30.0 - 60.0% of mass 95	49.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	73.6
175	5.0 - 9.0% of mass 174	5.5 (7.5)1
176	95.0 - 101.0% of mass 174	71.0 (96.5)1
177	5.0 - 9.0% of mass 176	5.1 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1AP9CAL	V1AP9CAL	V1ASTD7	02/15/08	1530
02	V1AP9CAL	V1AP9CAL	V1ASTD6	02/15/08	1605
03	V1AP9CAL	V1AP9CAL	V1ASTD5	02/15/08	1640
04	V1BLK0215LCS	V1BLK0215LCS	V1ICVAP9	02/15/08	1715
05	V1AP9CAL	V1AP9CAL	V1ASTD4	02/15/08	1750
06	V1AP9CAL	V1AP9CAL	V1ASTD3	02/15/08	1825
07	V1AP9CAL	V1AP9CAL	V1ASTD2	02/15/08	1900
08	V1AP9CAL	V1AP9CAL	V1ASTD1	02/15/08	1935
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA90517

Lab File ID: V1BFB01 BFB Injection Date: 07/01/08

Instrument ID: VOA1 BFB Injection Time: 1359

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	24.1
75	30.0 - 60.0% of mass 95	49.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	61.0
175	5.0 - 9.0% of mass 174	4.3 (7.0)1
176	95.0 - 101.0% of mass 174	58.1 (95.2)1
177	5.0 - 9.0% of mass 176	3.5 (6.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		V1STD200PPB	V1STD07	07/01/08	1510
02		V1STD100PPB	V1STD06	07/01/08	1550
03		V1STD50PPB	V1STD05	07/01/08	1629
04		V1BLK0701LCS	V1ICV01	07/01/08	1709
05		V1STD20PPB	V1STD04	07/01/08	1749
06		V1STD10PPB	V1STD03	07/01/08	1828
07		V1STD5PPB	V1STD02	07/01/08	1908
08		V1STD2PPB	V1STD01	07/01/08	1947
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Lab File ID: V1BFB01 BFB Injection Date: 07/02/08

Instrument ID: VOA1 BFB Injection Time: 0645

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	24.7
75	30.0 - 60.0% of mass 95	48.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.1
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	54.6
175	5.0 - 9.0% of mass 174	4.1 (7.4)1
176	95.0 - 101.0% of mass 174	54.3 (99.4)1
177	5.0 - 9.0% of mass 176	3.8 (7.0)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1STD50PPB	V1STD50PPB	V1CCV01	07/02/08	0717
02		V1AP9CCV	V1CCVA9	07/02/08	0757
03	V1BLK0702LCS	V1BLK0702LCS	V1LCS01	07/02/08	0836
04	V1BLK0702	V1BLK0702	V1PBLK01	07/02/08	0955
05	1041SB011(8-	0806303-01	0630301A	07/02/08	1114
06	1041DUP001(8	0806303-02	0630302A	07/02/08	1153
07	1041SB009(7-	0806303-03	0630303A	07/02/08	1233
08	1041SB010(7-	0806303-04	0630304A	07/02/08	1312
09	1041SB014(6-	0806303-05	0630305A	07/02/08	1352
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FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06303

Lab File ID (Standard): V1CCV01 Date Analyzed: 07/02/08

Instrument ID: VOA1 Time Analyzed: 0717

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	1100782	16.37	529643	22.27	419569	26.81
	UPPER LIMIT	2201564	16.87	1059286	22.77	839138	27.31
	LOWER LIMIT	550391	15.87	264822	21.77	209785	26.31
	CLIENT SAMPLE NO.						
01	V1BLK0702LCS	1073205	16.36	534835	22.26	410028	26.82
02	V1BLK0702	1055293	16.36	527539	22.25	398628	26.81
03	1041SB011(8-	1050125	16.38	535189	22.27	396957	26.82
04	1041DUP001(8	1039939	16.38	528849	22.27	393024	26.84
05	1041SB009(7-	1039185	16.38	522003	22.27	388313	26.84
06	1041SB010(7-	1027664	16.38	520454	22.27	379905	26.84
07	1041SB014(6-	1016254	16.38	515123	22.28	386516	26.83
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

ORGANIC CASE NARRATIVE - VOLATILES
Arcadis – Radford - 0806310

Date Sampled	Date Received	Lab ID	Client ID
27-Jun-2008	28-Jun-2008	0806310-01	1041HP017 (30-33) (062708)
27-Jun-2008	28-Jun-2008	0806310-02	1041HP017 (22-25) (062708)
27-Jun-2008	28-Jun-2008	0806310-03	1041HP018 (31-34) (062708)
27-Jun-2008	28-Jun-2008	0806310-04	1041HP018 (22-25) (062708)
27-Jun-2008	28-Jun-2008	0806310-05	1041DUP001(22-25) (062708)
27-Jun-2008	28-Jun-2008	0806310-06	TB-3 (062708)
27-Jun-2008	28-Jun-2008	0806310-07	1041HP016(17-28) (062708)
27-Jun-2008	28-Jun-2008	0806310-08	1041HP015 (062708)

Method: The samples were extracted/analyzed for client specified analyte lists by USEPA SW-846 Methods 5030B/8260B (purge and trap followed by capillary column GC/MS) for waters upon receipt to the laboratory in satisfactory condition.
Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- BFB Tuning: All method tuning criteria were met.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded in the calibration verification standard for 1,4-dioxane which exceeded with a negative bias of 40.1% and 36.6%. Results in the associated blanks and samples are qualified with a "Y" for a possible negative bias.
- Method Blank Results: Isopropyl benzene and/or methylene chloride were detected in the method blanks. Reported concentrations in the associated sample are qualified with a "B".
- Surrogate Recoveries: All recoveries were within limits.
- V4BLK0630LCS results: All recoveries were within limits.
- V4BLK0702LCS results: Recoveries of chloromethane and toluene exceeded the respective limits of 125% and 120% at 164% and 126%, respectively. All other recoveries were within limits.
- 1041HP018(31-34)MS/MSD results: 7 of 102 recoveries were outside the established limits with all relative percent differences within limits. See form 3.
- Internal Standard Area Counts: All internal standard area counts were within limits.
- Dilutions: Not applicable.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

ARCADIS

062708-1 (GW)

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name GP08RAAP.0047.DF000 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation MCISG / ARCADIS

0806310

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOCs (8260) VOA HCl	Remarks	Total
-01	1041HP017(30-33)(062708)	GW	6/27/08 7:45	-01	X	⑧high turbidity, please centrifuge	4
-02	1041HP017(22-25)(062708)	GW	6/27/08 7:55	-02	X	⑧high turbidity, please centrifuge	4
-03	1041HP018(31-34)(062708)	GW	6/27/08 13:15	-03	X	⑧high turbidity, please centrifuge	4
-04	1041HP018(22-25)(062708)	GW	6/27/08 17:00	-04	X	⑧MS/MSD ⑧high turbidity; centrifuge	12
-05	1041HP001(22-25)(062708)	GW	6/27/08 17:00	-05	X	⑧high turbidity; centrifuge	4
-06	1041HP015( )(062708)	GW	6/27/08 17:15	-08	X	⑧high turbidity; please centrifuge	4
-07	TB-3(062708)	L	6/27/08 —	-06	X		2
-08	1041HP016(17-28)(062708)	GW	6/27/08 16:05	-07	X	⑧high turbidity, please centrifuge	4
WS							

Sample Matrix: L = Liquid; S = Solid; A = Air GW = groundwater 5.8°C Total No. of Bottles/Containers 38

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 6/27/08	Time 18:00	Seal Intact?	Yes No N/A
Received by:	Organization:	Date / /	Time		
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	Yes No N/A
Received by:	Organization: Empirical	Date 6/28/08	Time 09:00		

Special Instructions/Remarks: ① Please contact with any questions ② Please centrifuge samples (high turbidity)

③ *24-hr TAT* on all groundwater samples

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0806310 COC ID(s): R 062708-1(6W)

Client Arcadis Project Radford

Sample Custodian WS Today's Date 6/28/08

Date/Time Samples Received 6/28/08 09:00
Airbill Number Fedex
Cooler Opened: Date 6/28/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 6/WS 1 Seal Date(s): 6/27/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 1 Temp. of Coolers 5.8°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP017
(30-33)(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631001

Level: (low/med) LOW Date Sampled: 06/27/08 07:45

% Moisture: not dec. _____ Date Analyzed: 06/30/08 10:34

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	13	
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	52	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

mm 7/18/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP017
(30-33)(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631001

Level: (low/med) LOW Date Sampled: 06/27/08 07:45

% Moisture: not dec. _____ Date Analyzed: 06/30/08 10:34

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP017
(22-25)(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631002

Level: (low/med) LOW Date Sampled: 06/27/08 07:55

% Moisture: not dec. _____ Date Analyzed: 06/30/08 11:04

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	15	
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	38	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0	~7.6/08	UJ
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041HP017
(22-25)(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631002

Level: (low/med) LOW Date Sampled: 06/27/08 07:55

% Moisture: not dec. _____ Date Analyzed: 06/30/08 11:04

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041HP01
8 (31-34)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631003

Level: (low/med) LOW Date Sampled: 06/27/08 13:15

% Moisture: not dec. _____ Date Analyzed: 06/30/08 11:33

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	19	
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	48	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

m 7/9/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP01
8 (31-34)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631003

Level: (low/med) LOW Date Sampled: 06/27/08 13:15

% Moisture: not dec. _____ Date Analyzed: 06/30/08 11:33

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0	0.32	J
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP018
(22-25)(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631004

Level: (low/med) LOW Date Sampled: 06/27/08 17:00

% Moisture: not dec. _____ Date Analyzed: 06/30/08 12:03

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	9.7	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	38	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UJ
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

mw 7/3/09

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP018
(22-25)(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631004

Level: (low/med) LOW Date Sampled: 06/27/08 17:00

% Moisture: not dec. _____ Date Analyzed: 06/30/08 12:03

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041DUP001(22--25) (062708

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631005

Level: (low/med) LOW Date Sampled: 06/27/08 17:00

% Moisture: not dec. _____ Date Analyzed: 06/30/08 12:32

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	8.6	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	37	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0	~7/9/08	UJ
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041DUP001(22--25) (062708

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631005

Level: (low/med) LOW Date Sampled: 06/27/08 17:00

% Moisture: not dec. _____ Date Analyzed: 06/30/08 12:32

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-3 (062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631006

Level: (low/med) LOW Date Sampled: 06/27/08 :

% Moisture: not dec. _____ Date Analyzed: 06/30/08 09:35

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	2.8	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0	m 7/3/08	UJ
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.48	JB
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-3 (062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631006

Level: (low/med) LOW Date Sampled: 06/27/08 :

% Moisture: not dec. _____ Date Analyzed: 06/30/08 09:35

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP016
(17-28) (062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631007

Level: (low/med) LOW Date Sampled: 06/27/08 16:05

% Moisture: not dec. _____ Date Analyzed: 06/30/08 13:02

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	1.4	J
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	51	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		U
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

7/8/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP016
(17-28)(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631007

Level: (low/med) LOW Date Sampled: 06/27/08 16:05

% Moisture: not dec. _____ Date Analyzed: 06/30/08 13:02

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP015
(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-08

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631008

Level: (low/med) LOW Date Sampled: 06/27/08 17:15

% Moisture: not dec. _____ Date Analyzed: 06/30/08 13:31

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10	45	
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10	8.7	J
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0	1.1	
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UJ
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0		U
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

7/8/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP015
(062708)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: 0806310-08

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0631008

Level: (low/med) LOW Date Sampled: 06/27/08 17:15

% Moisture: not dec. _____ Date Analyzed: 06/30/08 13:31

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V4BLK0630LCS	100	94	97	106	0
02	V4BLK0630	104	102	101	103	0
03	TB-3 (062708	110	105	101	102	0
04	1041HP017 (3	109	102	103	104	0
05	1041HP017 (2	105	96	102	105	0
06	1041HP018 (3	106	107	101	102	0
07	1041HP018 (2	113	106	103	106	0
08	1041DUP001(2	108	101	101	104	0
09	1041HP016(17	114	107	104	105	0
10	1041HP015 (0	109	100	103	102	0
11	V4BLK0702LCS	96	96	102	100	0
12	1041HP018 (3	96	96	105	102	0
13	1041HP018 (3	102	104	102	101	0
14	V4BLK0702	98	102	103	104	0
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		EL QC LIMITS	SPIKE CONC (ug/L)
SMC1 (DFM)	= Dibromofluoromethane	(85-120)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(80-135)	30
SMC3 (TOL)	= Toluene-d8	(85-115)	30
SMC4 (BFB)	= Bromofluorobenzene	(85-120)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: V4BLK0630

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	109.6	110	40-140
Benzene	50.00	0.0000	44.07	88	80-120
Bromochloromethane	50.00	0.0000	47.54	95	65-130
Bromodichloromethane	50.00	0.0000	46.70	93	75-120
Bromoform	50.00	0.0000	49.68	99	70-130
Bromomethane	50.00	0.0000	45.09	90	30-145
2-Butanone	100.0	0.0000	92.61	93	30-150
Carbon disulfide	50.00	0.0000	53.67	107	35-160
Carbon tetrachloride	50.00	0.0000	52.32	105	65-140
Chlorobenzene	50.00	0.0000	47.24	94	80-120
Chloroethane	50.00	0.0000	44.04	88	60-135
Chloroform	50.00	0.0000	43.49	87	65-135
Chloromethane	50.00	0.0000	58.14	116	40-125
Cyclohexane	50.00	0.0000	49.90	100	60-130
Dibromochloromethane	50.00	0.0000	50.87	102	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	43.26	86	50-130
1,2-Dibromoethane	50.00	0.0000	47.26	94	80-120
1,2-Dichlorobenzene	50.00	0.0000	44.54	89	70-120
1,3-Dichlorobenzene	50.00	0.0000	47.19	94	75-125
1,4-Dichlorobenzene	50.00	0.0000	44.34	89	75-125
Dichlorodifluoromethane	50.00	0.0000	49.08	98	30-155
1,1-Dichloroethane	50.00	0.0000	42.95	86	70-135
1,2-Dichloroethane	50.00	0.0000	50.42	101	70-130
1,1-Dichloroethene	50.00	0.0000	42.62	85	70-130
cis-1,2-Dichloroethene	50.00	0.0000	40.62	81	70-125
trans-1,2-Dichloroethen	50.00	0.0000	40.53	81	60-140
1,2-Dichloropropane	50.00	0.0000	45.16	90	75-125
cis-1,3-Dichloropropene	50.00	0.0000	45.90	92	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: V4BLK0630

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	49.64	99	55-140
1,4-Dioxane	1000	0.0000	731.1	73	50-150
Ethylbenzene	50.00	0.0000	45.82	92	75-125
2-Hexanone	100.0	0.0000	88.77	89	55-130
Isopropylbenzene	50.00	0.05135	53.02	106	75-125
Methyl acetate	50.00	0.0000	45.61	91	55-150
Methyl cyclohexane	50.00	0.0000	49.64	99	60-125
Methylene chloride	50.00	0.4304	45.79	91	55-140
4-Methyl-2-pentanone	100.0	0.0000	82.02	82	60-135
Methyl-tert-butyl ether	50.00	0.0000	43.66	87	65-125
Styrene	50.00	0.0000	49.94	100	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	40.98	82	65-130
Tetrachloroethene	55.00	0.0000	54.36	99	45-150
Toluene	50.00	0.0000	55.18	110	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	38.41	77	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	38.44	77	65-135
1,1,1-Trichloroethane	50.00	0.0000	46.69	93	65-130
1,1,2-Trichloroethane	50.00	0.0000	45.40	91	75-125
Trichloroethene	50.00	0.0000	44.16	88	70-125
Trichlorotrifluoroethan	50.00	0.0000	60.13	120	60-130
Trichlorofluoromethane	50.00	0.0000	55.14	110	60-145
Vinyl chloride	50.00	0.0000	53.37	107	50-145
Xylene(total)	150.0	0.0000	135.4	90	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 51 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: V4BLK0702

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	111.9	112	40-140
Benzene	50.00	0.0000	47.79	96	80-120
Bromochloromethane	50.00	0.0000	44.75	90	65-130
Bromodichloromethane	50.00	0.0000	45.78	92	75-120
Bromoform	50.00	0.0000	43.65	87	70-130
Bromomethane	50.00	0.0000	45.35	91	30-145
2-Butanone	100.0	0.0000	102.9	103	30-150
Carbon disulfide	50.00	0.0000	61.36	123	35-160
Carbon tetrachloride	50.00	0.0000	46.97	94	65-140
Chlorobenzene	50.00	0.0000	48.74	97	80-120
Chloroethane	50.00	0.0000	51.82	104	60-135
Chloroform	50.00	0.0000	42.97	86	65-135
Chloromethane	50.00	0.0000	81.84	164*	40-125
Cyclohexane	50.00	0.0000	60.22	120	60-130
Dibromochloromethane	50.00	0.0000	49.37	99	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	44.69	89	50-130
1,2-Dibromoethane	50.00	0.0000	47.74	95	80-120
1,2-Dichlorobenzene	50.00	0.0000	45.46	91	70-120
1,3-Dichlorobenzene	50.00	0.0000	41.57	83	75-125
1,4-Dichlorobenzene	50.00	0.0000	50.37	101	75-125
Dichlorodifluoromethane	50.00	0.0000	42.10	84	30-155
1,1-Dichloroethane	50.00	0.0000	51.05	102	70-135
1,2-Dichloroethane	50.00	0.0000	48.46	97	70-130
1,1-Dichloroethene	50.00	0.0000	47.69	95	70-130
cis-1,2-Dichloroethene	50.00	0.0000	43.26	86	70-125
trans-1,2-Dichloroethen	50.00	0.0000	45.61	91	60-140
1,2-Dichloropropane	50.00	0.0000	51.81	104	75-125
cis-1,3-Dichloropropene	50.00	0.0000	48.50	97	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: V4BLK0702

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	52.92	106	55-140
1,4-Dioxane	1000	0.0000	808.3	81	50-150
Ethylbenzene	50.00	0.0000	46.63	93	75-125
2-Hexanone	100.0	0.0000	106.0	106	55-130
Isopropylbenzene	50.00	0.0000	50.36	101	75-125
Methyl acetate	50.00	0.0000	61.17	122	55-150
Methyl cyclohexane	50.00	0.0000	51.95	104	60-125
Methylene chloride	50.00	0.6781	50.88	100	55-140
4-Methyl-2-pentanone	100.0	0.0000	101.4	101	60-135
Methyl-tert-butyl ether	50.00	0.0000	47.93	96	65-125
Styrene	50.00	0.0000	50.09	100	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	54.29	108	65-130
Tetrachloroethene	55.00	0.0000	50.18	91	45-150
Toluene	50.00	0.0000	62.87	126*	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	38.55	77	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	38.61	77	65-135
1,1,1-Trichloroethane	50.00	0.0000	44.88	90	65-130
1,1,2-Trichloroethane	50.00	0.0000	51.09	102	75-125
Trichloroethene	50.00	0.0000	44.23	88	70-125
Trichlorotrifluoroethan	50.00	0.0000	60.49	121	60-130
Trichlorofluoromethane	50.00	0.0000	50.06	100	60-145
Vinyl chloride	50.00	0.0000	70.30	141	50-145
Xylene(total)	150.0	0.0000	136.9	91	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 2 out of 51 outside limits

COMMENTS: _____

FORM 3

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: 1041HP018 (31-34 Lab Sample ID: 0806310-03

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Acetone	100.0	19.14	113.3	94	40-140
Benzene	50.00	0.0000	47.54	95	80-120
Bromochloromethane	50.00	0.0000	46.40	93	65-130
Bromodichloromethane	50.00	0.0000	45.33	91	75-120
Bromoform	50.00	0.0000	44.38	89	70-130
Bromomethane	50.00	0.0000	44.80	90	30-145
2-Butanone	100.0	0.0000	97.85	98	30-150
Carbon disulfide	50.00	0.0000	60.36	121	35-160
Carbon tetrachloride	50.00	0.0000	45.80	92	65-140
Chlorobenzene	50.00	0.0000	48.96	98	80-120
Chloroethane	50.00	0.0000	52.15	104	60-135
Chloroform	50.00	47.95	82.99	70	65-135
Chloromethane	50.00	0.0000	81.73	163*	40-125
Cyclohexane	50.00	0.0000	59.42	119	60-130
Dibromochloromethane	50.00	0.0000	49.53	99	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	43.83	88	50-130
1,2-Dibromoethane	50.00	0.0000	49.80	100	80-120
1,2-Dichlorobenzene	50.00	0.0000	43.05	86	70-120
1,3-Dichlorobenzene	50.00	0.0000	42.74	85	75-125
1,4-Dichlorobenzene	50.00	0.0000	45.89	92	75-125
Dichlorodifluoromethane	50.00	0.0000	44.04	88	30-155
1,1-Dichloroethane	50.00	0.0000	49.28	98	70-135
1,2-Dichloroethane	50.00	0.0000	48.58	97	70-130
1,1-Dichloroethene	50.00	0.0000	46.69	93	70-130
cis-1,2-Dichloroethene	50.00	0.0000	44.48	89	70-125
trans-1,2-Dichloroethen	50.00	0.0000	44.52	89	60-140
1,2-Dichloropropane	50.00	0.0000	52.92	106	75-125
cis-1,3-Dichloropropene	50.00	0.0000	41.83	84	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: 1041HP018 (31-34 Lab Sample ID: 0806310-03

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	47.18	94	55-140
1,4-Dioxane	1000	0.0000	816.2	82	50-150
Ethylbenzene	50.00	0.0000	47.43	95	75-125
2-Hexanone	100.0	0.0000	104.0	104	55-130
Isopropylbenzene	50.00	0.0000	50.54	101	75-125
Methyl acetate	50.00	0.0000	23.76	48*	55-150
Methyl cyclohexane	50.00	0.0000	48.23	96	60-125
Methylene chloride	50.00	0.0000	49.33	99	55-140
4-Methyl-2-pentanone	100.0	0.0000	103.1	103	60-135
Methyl-tert-butyl ether	50.00	0.0000	47.14	94	65-125
Styrene	50.00	0.0000	45.09	90	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	53.01	106	65-130
Tetrachloroethene	55.00	0.0000	45.78	83	45-150
Toluene	50.00	0.0000	62.97	126*	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	39.42	79	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	37.03	74	65-135
1,1,1-Trichloroethane	50.00	0.0000	43.31	87	65-130
1,1,2-Trichloroethane	50.00	0.0000	51.80	104	75-125
Trichloroethene	50.00	0.3152	46.08	92	70-125
Trichlorotrifluoroethan	50.00	0.0000	59.24	118	60-130
Trichlorofluoromethane	50.00	0.0000	48.84	98	60-145
Vinyl chloride	50.00	0.0000	71.22	142	50-145
Xylene(total)	150.0	0.0000	126.8	84	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: 1041HP018 (31-34 Lab Sample ID: 0806310-03

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acetone	100.0	103.6	84	9	30	40-140
Benzene	50.00	48.14	96	1	30	80-120
Bromochloromethane	50.00	45.90	92	1	30	65-130
Bromodichloromethane	50.00	46.79	94	3	30	75-120
Bromoform	50.00	43.90	88	1	30	70-130
Bromomethane	50.00	47.04	94	5	30	30-145
2-Butanone	100.0	93.55	94	4	30	30-150
Carbon disulfide	50.00	61.20	122	1	30	35-160
Carbon tetrachloride	50.00	47.31	95	3	30	65-140
Chlorobenzene	50.00	47.33	95	3	30	80-120
Chloroethane	50.00	52.08	104	0	30	60-135
Chloroform	50.00	87.95	80	6	30	65-135
Chloromethane	50.00	78.01	156*	5	30	40-125
Cyclohexane	50.00	60.54	121	2	30	60-130
Dibromochloromethane	50.00	48.99	98	1	30	60-135
1,2-Dibromo-3-chloropro	50.00	46.19	92	5	30	50-130
1,2-Dibromoethane	50.00	47.83	96	4	30	80-120
1,2-Dichlorobenzene	50.00	43.83	88	2	30	70-120
1,3-Dichlorobenzene	50.00	37.16	74*	14	30	75-125
1,4-Dichlorobenzene	50.00	42.02	84	9	30	75-125
Dichlorodifluoromethane	50.00	45.74	91	4	30	30-155
1,1-Dichloroethane	50.00	50.21	100	2	30	70-135
1,2-Dichloroethane	50.00	49.32	99	2	30	70-130
1,1-Dichloroethene	50.00	46.00	92	1	30	70-130
cis-1,2-Dichloroethene	50.00	44.88	90	1	30	70-125
trans-1,2-Dichloroethen	50.00	44.82	90	1	30	60-140
1,2-Dichloropropane	50.00	51.69	103	2	30	75-125
cis-1,3-Dichloropropene	50.00	43.53	87	4	30	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix Spike - Client Sample No.: 1041HP018 (31-34 Lab Sample ID: 0806310-03

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
trans-1,3-Dichloroprope	50.00	48.40	97	2	30	55-140
1,4-Dioxane	1000	863.0	86	6	30	50-150
Ethylbenzene	50.00	45.71	91	4	30	75-125
2-Hexanone	100.0	102.8	103	1	30	55-130
Isopropylbenzene	50.00	49.50	99	2	30	75-125
Methyl acetate	50.00	22.00	44*	8	30	55-150
Methyl cyclohexane	50.00	50.92	102	5	30	60-125
Methylene chloride	50.00	50.70	101	3	30	55-140
4-Methyl-2-pentanone	100.0	105.6	106	2	30	60-135
Methyl-tert-butyl ether	50.00	46.44	93	1	30	65-125
Styrene	50.00	45.79	92	2	30	65-135
1,1,2,2-Tetrachloroetha	50.00	52.25	104	1	30	65-130
Tetrachloroethene	55.00	44.62	81	2	30	45-150
Toluene	50.00	60.46	121*	4	30	75-120
1,2,3-Trichlorobenzene	50.00	38.72	77	2	30	55-140
1,2,4-Trichlorobenzene	50.00	35.91	72	3	30	65-135
1,1,1-Trichloroethane	50.00	44.28	88	2	30	65-130
1,1,2-Trichloroethane	50.00	50.56	101	2	30	75-125
Trichloroethene	50.00	45.66	91	1	30	70-125
Trichlorotrifluoroethan	50.00	59.72	119	1	30	60-130
Trichlorofluoromethane	50.00	50.56	101	3	30	60-145
Vinyl chloride	50.00	71.73	143	1	30	50-145
Xylene(total)	150.0	130.8	87	3	30	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 51 outside limits
Spike Recovery: 7 out of 102 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V4BLK0630

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Lab File ID: V4BLKA9 Lab Sample ID: V4BLK0630

Date Analyzed: 06/30/08 Time Analyzed: 0906

Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA4

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V4BLK0630LCS	V4BLK0630LCS	V4LCSAP9	0740
02	TB-3 (062708	0806310-06	0631006	0935
03	1041HP017 (3	0806310-01	0631001	1034
04	1041HP017 (2	0806310-02	0631002	1104
05	1041HP018 (3	0806310-03	0631003	1133
06	1041HP018 (2	0806310-04	0631004	1203
07	1041DUP001(2	0806310-05	0631005	1232
08	1041HP016(17	0806310-07	0631007	1302
09	1041HP015 (0	0806310-08	0631008	1331
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0630

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0630

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLKA9

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 06/30/08 09:06

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0	0.051	J
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.43	J
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

7/16/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0630

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0630

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLKA9

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 06/30/08 09:06

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V4BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Lab File ID: V4BLKA9 Lab Sample ID: V4BLK0702

Date Analyzed: 07/02/08 Time Analyzed: 1346

Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA4

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V4BLK0702LCS	V4BLK0702LCS	V4LCSAP9	1121
02	1041HP018 (3	0806310-03MS	0631003M	1150
03	1041HP018 (3	0806310-03MSD	0631003S	1220
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0702

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLKA9

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 07/02/08 13:46

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.1	10		U
71-43-2	Benzene	0.11	1.0		U
74-97-5	Bromochloromethane	0.31	1.0		U
75-27-4	Bromodichloromethane	0.086	1.0		U
75-25-2	Bromoform	0.24	1.0		U
74-83-9	Bromomethane	0.33	1.0		U
78-93-3	2-Butanone	1.2	10		U
75-15-0	Carbon disulfide	0.13	1.0		U
56-23-5	Carbon tetrachloride	0.14	1.0		U
108-90-7	Chlorobenzene	0.28	1.0		U
75-00-3	Chloroethane	0.38	1.0		U
67-66-3	Chloroform	0.10	1.0		U
74-87-3	Chloromethane	0.40	1.0		U
110-82-7	Cyclohexane	0.18	1.0		U
124-48-1	Dibromochloromethane	0.080	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.28	1.0		U
106-93-4	1,2-Dibromoethane	0.070	1.0		U
95-50-1	1,2-Dichlorobenzene	0.17	1.0		U
541-73-1	1,3-Dichlorobenzene	0.21	1.0		U
106-46-7	1,4-Dichlorobenzene	0.12	1.0		U
75-71-8	Dichlorodifluoromethane	0.24	1.0		U
75-34-3	1,1-Dichloroethane	0.15	1.0		U
107-06-2	1,2-Dichloroethane	0.15	1.0		U
75-35-4	1,1-Dichloroethene	0.42	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.44	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.40	1.0		U
78-87-5	1,2-Dichloropropane	0.18	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.13	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.22	1.0		U
123-91-1	1,4-Dioxane	0.20	5.0		UY
100-41-4	Ethylbenzene	0.14	1.0		U
591-78-6	2-Hexanone	0.83	5.0		U
98-82-8	Isopropylbenzene	0.034	1.0		U
79-20-9	Methyl acetate	0.87	1.0		U
108-87-2	Methyl cyclohexane	0.20	1.0		U
75-09-2	Methylene chloride	0.26	1.0	0.68	J
108-10-1	4-Methyl-2-pentanone	1.4	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.17	1.0		U
100-42-5	Styrene	0.22	1.0		U

m 7/8/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Matrix: (soil/water) WATER Lab Sample ID: V4BLK0702

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLKA9

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 07/02/08 13:46

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.070	1.0		U
127-18-4	Tetrachloroethene	0.14	1.0		U
108-88-3	Toluene	0.18	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.16	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.14	1.0		U
71-55-6	1,1,1-Trichloroethane	0.15	1.0		U
79-00-5	1,1,2-Trichloroethane	0.17	1.0		U
79-01-6	Trichloroethene	0.28	1.0		U
76-13-1	Trichlorotrifluoroethane	0.22	1.0		U
75-69-4	Trichlorofluoromethane	0.15	1.0		U
75-01-4	Vinyl chloride	0.19	1.0		U
1330-20-7	Xylene(total)	0.21	1.0		U

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: CITY

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA25189

Lab File ID: V4BFB01 BFB Injection Date: 04/02/08

Instrument ID: VOA4 BFB Injection Time: 1352

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.3
75	30.0 - 60.0% of mass 95	41.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	82.0
175	5.0 - 9.0% of mass 174	6.1 (7.4)1
176	95.0 - 101.0% of mass 174	78.2 (95.4)1
177	5.0 - 9.0% of mass 176	5.3 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		V4CALIB	V4ASTD09	04/02/08	1649
02		V4CALIB	V4ASTD08	04/02/08	1718
03		V4CALIB	V4ASTD07	04/02/08	1748
04		V4CALIB	V4ASTD06	04/02/08	1847
05		V4CALIB	V4ASTD05	04/02/08	1916
06		V4CALIB	V4ASTD04	04/02/08	1946
07		V4CALIB	V4ASTD03	04/02/08	2015
08		V4CALIB	V4ASTD02	04/02/08	2044
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA25189

Lab File ID: V4BFB01 BFB Injection Date: 05/20/08

Instrument ID: VOA4 BFB Injection Time: 1254

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.2
75	30.0 - 60.0% of mass 95	44.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	81.6
175	5.0 - 9.0% of mass 174	6.0 (7.4)1
176	95.0 - 101.0% of mass 174	78.3 (96.0)1
177	5.0 - 9.0% of mass 176	5.7 (7.2)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD200PPB	V4STD200PPB	V4STD09A	05/20/08	1324
02	V4STD100PPB	V4STD100PPB	V4STD08	05/20/08	1423
03	V4STD50PPB	V4STD50PPB	V4STD07	05/20/08	1452
04	V4STD20PPB	V4STD20PPB	V4STD06	05/20/08	1551
05	V4STD10PPB	V4STD10PPB	V4STD05	05/20/08	1621
06	V4STD2PPB	V4STD2PPB	V4STD04	05/20/08	1650
07	V4STD1PPB	V4STD1PPB	V4STD03	05/20/08	1720
08	V4STD0.5PPB	V4STD0.5PPB	V4STD02	05/20/08	1749
09	V4STD0.25PPB	V4STD0.25PPB	V4STD01	05/20/08	1819
10	V4BLK0520LCS	V4BLK0520LCS	V4LCS01	05/20/08	1848
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Lab File ID: V4BFB01 BFB Injection Date: 06/30/08

Instrument ID: VOA4 BFB Injection Time: 0611

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.1
75	30.0 - 60.0% of mass 95	42.2
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	78.0
175	5.0 - 9.0% of mass 174	6.3 (8.1)1
176	95.0 - 101.0% of mass 174	75.9 (97.4)1
177	5.0 - 9.0% of mass 176	5.4 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD50PPB	V4STD50PPB	V4CCV01	06/30/08	0641
02	V4STD50PPB	V4STD50PPB	V4CCVA9	06/30/08	0710
03	V4BLK0630LCS	V4BLK0630LCS	V4LCSAP9	06/30/08	0740
04	V4BLK0630	V4BLK0630	V4BLKA9	06/30/08	0906
05	TB-3 (062708	0806310-06	0631006	06/30/08	0935
06	1041HP017 (3	0806310-01	0631001	06/30/08	1034
07	1041HP017 (2	0806310-02	0631002	06/30/08	1104
08	1041HP018 (3	0806310-03	0631003	06/30/08	1133
09	1041HP018 (2	0806310-04	0631004	06/30/08	1203
10	1041DUP001(2	0806310-05	0631005	06/30/08	1232
11	1041HP016(17	0806310-07	0631007	06/30/08	1302
12	1041HP015 (0	0806310-08	0631008	06/30/08	1331
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Lab File ID: V4BFB01 BFB Injection Date: 07/02/08

Instrument ID: VOA4 BFB Injection Time: 0851

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.0
75	30.0 - 60.0% of mass 95	36.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	84.2
175	5.0 - 9.0% of mass 174	6.0 (7.1)1
176	95.0 - 101.0% of mass 174	82.3 (97.8)1
177	5.0 - 9.0% of mass 176	5.6 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V4STD50PPB	V4STD50PPB	V4CCV01	07/02/08	1005
02	V4STD50PPB	V4STD50PPB	V4CCVA9	07/02/08	1051
03	V4BLK0702LCS	V4BLK0702LCS	V4LCSAP9	07/02/08	1121
04	1041HP018 (3	0806310-03MS	0631003M	07/02/08	1150
05	1041HP018 (3	0806310-03MSD	0631003S	07/02/08	1220
06	V4BLK0702	V4BLK0702	V4BLKA9	07/02/08	1346
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FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Lab File ID (Standard): V4CCV01 Date Analyzed: 06/30/08

Instrument ID: VOA4 Time Analyzed: 0641

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1(FLB) AREA	#	RT	#	IS2(CBZ) AREA	#	RT	#	IS3(DCB) AREA	#	RT	#
	12 HOUR STD	1018906		13.29		432141		16.63		558324		18.59	
	UPPER LIMIT	2037812		13.79		864282		17.13		1116648		19.09	
	LOWER LIMIT	509453		12.79		216071		16.13		279162		18.09	
	CLIENT SAMPLE NO.												
01	V4BLK0630LCS	1014995		13.30		435161		16.63		549157		18.58	
02	V4BLK0630	946386		13.30		397323		16.63		471540		18.58	
03	TB-3 (062708	925949		13.29		399278		16.62		468722		18.58	
04	1041HP017 (3	933475		13.29		394024		16.62		452286		18.58	
05	1041HP017 (2	956414		13.29		393711		16.63		464213		18.58	
06	1041HP018 (3	965573		13.29		402099		16.63		465852		18.58	
07	1041HP018 (2	913150		13.29		392519		16.63		463123		18.58	
08	1041DUP001(2	964831		13.29		395650		16.63		458715		18.58	
09	1041HP016(17	927387		13.29		391520		16.62		477198		18.58	
10	1041HP015 (0	996601		13.29		425695		16.63		482041		18.58	
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06310

Lab File ID (Standard): V4CCV01 Date Analyzed: 07/02/08

Instrument ID: VOA4 Time Analyzed: 1005

GC Column: DB-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1(FLB) AREA	#	RT	#	IS2(CBZ) AREA	#	RT	#	IS3(DCB) AREA	#	RT	#
	12 HOUR STD	996555		13.29		390439		16.63		419974		18.58	
	UPPER LIMIT	1993110		13.79		780878		17.13		839948		19.08	
	LOWER LIMIT	498278		12.79		195220		16.13		209987		18.08	
	CLIENT SAMPLE NO.												
01	V4BLK0702LCS	986171		13.30		392305		16.62		415154		18.58	
02	1041HP018 (3	969875		13.29		379629		16.63		411180		18.58	
03	1041HP018 (3	915935		13.29		371671		16.62		399228		18.58	
04	V4BLK0702	903377		13.29		350631		16.63		358677		18.58	
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IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

ORGANIC CASE NARRATIVE - VOLATILES
Arcadis – Radford - 0806311

Date Sampled	Date Received	Lab ID	Client ID
27-Jun-2008	28-Jun-2008	0806311-01	1041SB018 (6-7)
27-Jun-2008	28-Jun-2008	0806311-02	1041SB019 (6-7)

Method: The samples were extracted/analyzed for client specified analyte lists by 5035/8260B (encore field sampling with laboratory preservation then purge and trap followed by capillary column GC/MS) for soils upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- BFB Tuning: All method tuning criteria were met.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded in the calibration verification standard for 1,4-dioxane which exceeded with a negative bias of 33%. Results in the associated samples are qualified with a "Y" for a potential negative bias.
- Method Blank Results: Cyclohexane, methylene chloride and toluene were detected in the method. Reported concentrations in the associated sample are qualified with a "B".
- Surrogate Recoveries: All recoveries were within limits.
- LCS results: All recoveries were within limits.
- MS/MSD results: Not applicable.
- Internal Standard Area Counts: All internal standard area counts were within limits.
- Dilutions: Not applicable.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name GP08 RAAP 0047. DF000 / RAAP

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation SG/MC | ARCADIS

806311

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOCs none	encores	Moisture none	wajar					Remarks	Total
01	1041SB018(6-7)	So	6/27/08 | 10:15		X	X								4
02	1041SB019(6-7)	So	6/27/08 | 14:30		X	X								4

Sample Matrix: L = Liquid; S = Solid; A = Air So = Soil

5.8°C

Total No. of Bottles/Containers: 8

						Seal Intact?
Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 6/27/08	Time 18:00	Yes No N/A
Received by:	Organization:	Date / /	Time	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by:	Organization: Empirical	Date 6/28/08	Time 09:00	Yes No N/A

Special Instructions/Remarks: ① standard TAT ② please contact with any questions

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0806311 COC ID(s): 062708-2 (10)

Client Arcadis Project Radford

Sample Custodian WS Today's Date 6/28/08

Date/Time Samples Received 6/28/08 09:00
Airbill Number Fedex
Cooler Opened: Date 6/28/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 6/27/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 1 Temp. of Coolers 5.8°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB018 (6-7)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix: (soil/water) SOIL Lab Sample ID: 0806311-01

Sample wt/vol: 4.4 (g/mL) G Lab File ID: 0631101A

Level: (low/med) LOW Date Sampled: 06/27/08 10:15

% Moisture: not dec. 31 Date Analyzed: 07/02/08 14:31

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	3.3	16		U
71-43-2	Benzene	0.78	8.3		U
74-97-5	Bromochloromethane	0.70	8.3		U
75-27-4	Bromodichloromethane	0.50	8.3		U
75-25-2	Bromoform	1.6	8.3		U
74-83-9	Bromomethane	1.2	8.3		U
78-93-3	2-Butanone	2.3	16		U
75-15-0	Carbon disulfide	2.2	8.3		U
56-23-5	Carbon tetrachloride	1.4	8.3		U
108-90-7	Chlorobenzene	0.56	8.3		U
75-00-3	Chloroethane	1.8	8.3		U
67-66-3	Chloroform	0.91	8.3	3.8	J
74-87-3	Chloromethane	0.86	8.3		U
110-82-7	Cyclohexane	0.89	8.3		U
124-48-1	Dibromochloromethane	0.56	8.3		U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	8.3		U
106-93-4	1,2-Dibromoethane	0.71	8.3		U
95-50-1	1,2-Dichlorobenzene	0.61	8.3		U
541-73-1	1,3-Dichlorobenzene	1.4	8.3		U
106-46-7	1,4-Dichlorobenzene	0.91	8.3		U
75-71-8	Dichlorodifluoromethane	1.8	8.3		U
75-34-3	1,1-Dichloroethane	0.89	8.3		U
107-06-2	1,2-Dichloroethane	0.76	8.3		U
75-35-4	1,1-Dichloroethene	2.0	8.3		U
156-59-2	cis-1,2-Dichloroethene	2.0	8.3		U
156-60-5	trans-1,2-Dichloroethene	1.8	8.3		U
78-87-5	1,2-Dichloropropane	0.76	8.3		U
10061-01-5	cis-1,3-Dichloropropene	0.83	8.3		U
10061-02-6	trans-1,3-Dichloropropene	0.53	8.3		U
123-91-1	1,4-Dioxane	0.83	83	7.8.08	UJ
100-41-4	Ethylbenzene	1.2	8.3		U
591-78-6	2-Hexanone	3.8	16		U
98-82-8	Isopropylbenzene	1.4	8.3		U
79-20-9	Methyl acetate	2.6	8.3		U
108-87-2	Methyl cyclohexane	0.50	8.3		U
75-09-2	Methylene chloride	1.0	8.3	6.5	JB
108-10-1	4-Methyl-2-pentanone	0.96	16		U
1634-04-4	Methyl-tert-butyl ether	0.53	8.3		U
100-42-5	Styrene	0.58	8.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB018 (6-7)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix: (soil/water) SOIL Lab Sample ID: 0806311-01

Sample wt/vol: 4.4 (g/mL) G Lab File ID: 0631101A

Level: (low/med) LOW Date Sampled: 06/27/08 10:15

% Moisture: not dec. 31 Date Analyzed: 07/02/08 14:31

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MDL	RL	CONC	UG/KG Q
79-34-5	1,1,2,2-Tetrachloroethane	0.71	8.3		U
127-18-4	Tetrachloroethene	1.6	8.3		U
108-88-3	Toluene	1.4	8.3		U
87-61-6	1,2,3-Trichlorobenzene	0.70	8.3		U
120-82-1	1,2,4-Trichlorobenzene	0.30	8.3		U
71-55-6	1,1,1-Trichloroethane	1.5	8.3		U
79-00-5	1,1,2-Trichloroethane	0.58	8.3		U
79-01-6	Trichloroethene	1.4	8.3		U
76-13-1	Trichlorotrifluoroethane	0.91	8.3		U
75-69-4	Trichlorofluoromethane	1.6	8.3		U
75-01-4	Vinyl chloride	1.8	8.3		U
1330-20-7	Xylene(total)	1.2	8.3		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB019 (6-7)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix: (soil/water) SOIL Lab Sample ID: 0806311-02

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0631102A

Level: (low/med) LOW Date Sampled: 06/27/08 14:30

% Moisture: not dec. 22 Date Analyzed: 07/02/08 15:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.3	11	3.4	J
71-43-2	Benzene	0.54	5.7		U
74-97-5	Bromochloromethane	0.48	5.7		U
75-27-4	Bromodichloromethane	0.34	5.7		U
75-25-2	Bromoform	1.1	5.7		U
74-83-9	Bromomethane	0.82	5.7		U
78-93-3	2-Butanone	1.6	11		U
75-15-0	Carbon disulfide	1.5	5.7		U
56-23-5	Carbon tetrachloride	1.0	5.7		U
108-90-7	Chlorobenzene	0.39	5.7		U
75-00-3	Chloroethane	1.2	5.7		U
67-66-3	Chloroform	0.63	5.7		U
74-87-3	Chloromethane	0.59	5.7		U
110-82-7	Cyclohexane	0.62	5.7		U
124-48-1	Dibromochloromethane	0.39	5.7		U
96-12-8	1,2-Dibromo-3-chloropropane	1.4	5.7		U
106-93-4	1,2-Dibromoethane	0.49	5.7		U
95-50-1	1,2-Dichlorobenzene	0.42	5.7		U
541-73-1	1,3-Dichlorobenzene	0.96	5.7		U
106-46-7	1,4-Dichlorobenzene	0.63	5.7		U
75-71-8	Dichlorodifluoromethane	1.2	5.7		U
75-34-3	1,1-Dichloroethane	0.62	5.7		U
107-06-2	1,2-Dichloroethane	0.52	5.7		U
75-35-4	1,1-Dichloroethene	1.4	5.7		U
156-59-2	cis-1,2-Dichloroethene	1.4	5.7		U
156-60-5	trans-1,2-Dichloroethene	1.2	5.7		U
78-87-5	1,2-Dichloropropane	0.52	5.7		U
10061-01-5	cis-1,3-Dichloropropene	0.57	5.7		U
10061-02-6	trans-1,3-Dichloropropene	0.36	5.7		U
123-91-1	1,4-Dioxane	0.57	57	7/8/08	UJ
100-41-4	Ethylbenzene	0.86	5.7		U
591-78-6	2-Hexanone	2.6	11		U
98-82-8	Isopropylbenzene	1.0	5.7		U
79-20-9	Methyl acetate	1.8	5.7		U
108-87-2	Methyl cyclohexane	0.34	5.7		U
75-09-2	Methylene chloride	0.71	5.7	4.9	JB
108-10-1	4-Methyl-2-pentanone	0.66	11		U
1634-04-4	Methyl-tert-butyl ether	0.36	5.7		U
100-42-5	Styrene	0.40	5.7		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041SB019 (6-7)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix: (soil/water) SOIL Lab Sample ID: 0806311-02

Sample wt/vol: 5.6 (g/mL) G Lab File ID: 0631102A

Level: (low/med) LOW Date Sampled: 06/27/08 14:30

% Moisture: not dec. 22 Date Analyzed: 07/02/08 15:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.49	5.7		U
127-18-4	Tetrachloroethene	1.1	5.7		U
108-88-3	Toluene	0.98	5.7		U
87-61-6	1,2,3-Trichlorobenzene	0.48	5.7		U
120-82-1	1,2,4-Trichlorobenzene	0.20	5.7		U
71-55-6	1,1,1-Trichloroethane	1.0	5.7		U
79-00-5	1,1,2-Trichloroethane	0.40	5.7		U
79-01-6	Trichloroethene	0.97	5.7		U
76-13-1	Trichlorotrifluoroethane	0.63	5.7		U
75-69-4	Trichlorofluoromethane	1.1	5.7		U
75-01-4	Vinyl chloride	1.2	5.7		U
1330-20-7	Xylene(total)	0.80	5.7		U

FORM 2
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Level:(low/med) LOW

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V1BLK0702LCS	97	96	98	100	0
02	V1BLK0702	102	97	102	102	0
03	1041SB018 (6	104	106	100	100	0
04	1041SB019 (6	103	101	101	100	0
05						
06						
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11						
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	EL QC LIMITS	SPIKE CONC (ug/Kg)
SMC1 (DFM) = Dibromofluoromethane	(80-125)	30
SMC2 (DCE) = 1,2-Dichloroethane-d4	(75-140)	30
SMC3 (TOL) = Toluene-d8	(80-120)	30
SMC4 (BFB) = Bromofluorobenzene	(80-125)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix Spike - Client Sample No.: V1BLK0702 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	90.40	90	20-160
Benzene	50.00	0.0000	50.83	102	75-125
Bromochloromethane	50.00	0.0000	51.84	104	70-125
Bromodichloromethane	50.00	0.0000	50.21	100	70-130
Bromoform	50.00	0.0000	53.78	108	55-135
Bromomethane	50.00	0.0000	44.23	88	30-160
2-Butanone	100.0	0.0000	97.56	98	30-160
Carbon disulfide	50.00	0.0000	49.46	99	45-160
Carbon tetrachloride	50.00	0.0000	50.90	102	65-135
Chlorobenzene	50.00	0.0000	50.21	100	75-125
Chloroethane	50.00	0.0000	50.41	101	40-155
Chloroform	50.00	0.0000	51.16	102	70-125
Chloromethane	50.00	0.0000	52.76	106	50-130
Cyclohexane	50.00	0.6325	49.34	97	65-140
Dibromochloromethane	50.00	0.0000	52.07	104	65-130
1,2-Dibromo-3-chloropro	50.00	0.0000	47.40	95	40-135
1,2-Dibromoethane	50.00	0.0000	50.24	100	70-125
1,2-Dichlorobenzene	50.00	0.0000	50.74	101	75-120
1,3-Dichlorobenzene	50.00	0.0000	50.91	102	70-125
1,4-Dichlorobenzene	50.00	0.0000	48.37	97	70-125
Dichlorodifluoromethane	50.00	0.0000	51.52	103	35-135
1,1-Dichloroethane	50.00	0.0000	50.46	101	75-125
1,2-Dichloroethane	50.00	0.0000	51.67	103	70-125
1,1-Dichloroethene	50.00	0.0000	47.37	95	65-135
cis-1,2-Dichloroethene	50.00	0.0000	50.40	101	65-125
trans-1,2-Dichloroethen	50.00	0.0000	48.43	97	65-135
1,2-Dichloropropane	50.00	0.0000	50.66	101	70-120
cis-1,3-Dichloropropene	50.00	0.0000	52.48	105	70-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
SOIL VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix Spike - Client Sample No.: V1BLK0702 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	51.49	103	65-125
1,4-Dioxane	1000	0.0000	754.8	75	50-150
Ethylbenzene	50.00	0.0000	49.53	99	75-125
2-Hexanone	100.0	0.0000	103.2	103	45-145
Isopropylbenzene	50.00	0.0000	50.12	100	75-130
Methyl acetate	50.00	0.0000	50.44	101	45-265
Methyl cyclohexane	50.00	0.0000	51.24	102	65-135
Methylene chloride	50.00	6.480	43.18	73	55-140
4-Methyl-2-pentanone	100.0	0.0000	100.6	101	45-145
Methyl-tert-butyl ether	50.00	0.0000	49.48	99	55-150
Styrene	50.00	0.0000	50.48	101	75-125
1,1,2,2-Tetrachloroetha	50.00	0.0000	50.36	101	55-130
Tetrachloroethene	55.00	0.0000	54.94	100	65-140
Toluene	50.00	0.0000	48.15	96	70-125
1,2,3-Trichlorobenzene	50.00	0.0000	50.19	100	60-135
1,2,4-Trichlorobenzene	50.00	0.0000	49.00	98	65-130
1,1,1-Trichloroethane	50.00	0.0000	48.97	98	70-135
1,1,2-Trichloroethane	50.00	0.0000	51.22	102	60-125
Trichloroethene	50.00	0.0000	51.33	103	75-125
Trichlorotrifluoroethan	50.00	0.0000	50.73	101	60-140
Trichlorofluoromethane	50.00	0.0000	48.85	98	25-185
Vinyl chloride	50.00	0.0000	49.64	99	60-125
Xylene(total)	150.0	0.0000	144.5	96	70-120

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 51 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V1BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Lab File ID: V1PBLK02 Lab Sample ID: V1BLK0702

Date Analyzed: 07/02/08 Time Analyzed: 1034

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

Instrument ID: VOA1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V1BLK0702LCS	V1BLK0702LCS	V1LCS01	0836
02	1041SB018 (6	0806311-01	0631101A	1431
03	1041SB019 (6	0806311-02	0631102A	1511
04				
05				
06				
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0702

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1PBLK02

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 07/02/08 10:34

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	2.0	10		U
71-43-2	Benzene	0.47	5.0		U
74-97-5	Bromochloromethane	0.42	5.0		U
75-27-4	Bromodichloromethane	0.30	5.0		U
75-25-2	Bromoform	1.0	5.0		U
74-83-9	Bromomethane	0.72	5.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	1.3	5.0		U
56-23-5	Carbon tetrachloride	0.88	5.0		U
108-90-7	Chlorobenzene	0.34	5.0		U
75-00-3	Chloroethane	1.1	5.0		U
67-66-3	Chloroform	0.55	5.0		U
74-87-3	Chloromethane	0.52	5.0		U
110-82-7	Cyclohexane	0.54	5.0	0.63	J
124-48-1	Dibromochloromethane	0.34	5.0		U
96-12-8	1,2-Dibromo-3-chloropropane	1.2	5.0		U
106-93-4	1,2-Dibromoethane	0.43	5.0		U
95-50-1	1,2-Dichlorobenzene	0.37	5.0		U
541-73-1	1,3-Dichlorobenzene	0.84	5.0		U
106-46-7	1,4-Dichlorobenzene	0.55	5.0		U
75-71-8	Dichlorodifluoromethane	1.1	5.0		U
75-34-3	1,1-Dichloroethane	0.54	5.0		U
107-06-2	1,2-Dichloroethane	0.46	5.0		U
75-35-4	1,1-Dichloroethene	1.2	5.0		U
156-59-2	cis-1,2-Dichloroethene	1.2	5.0		U
156-60-5	trans-1,2-Dichloroethene	1.1	5.0		U
78-87-5	1,2-Dichloropropane	0.46	5.0		U
10061-01-5	cis-1,3-Dichloropropene	0.50	5.0		U
10061-02-6	trans-1,3-Dichloropropene	0.32	5.0		U
123-91-1	1,4-Dioxane	0.50	50	mc 7/9/08	UJ
100-41-4	Ethylbenzene	0.75	5.0		U
591-78-6	2-Hexanone	2.3	10		U
98-82-8	Isopropylbenzene	0.88	5.0		U
79-20-9	Methyl acetate	1.6	5.0		U
108-87-2	Methyl cyclohexane	0.30	5.0		U
75-09-2	Methylene chloride	0.62	5.0	6.5	
108-10-1	4-Methyl-2-pentanone	0.58	10		U
1634-04-4	Methyl-tert-butyl ether	0.32	5.0		U
100-42-5	Styrene	0.35	5.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V1BLK0702

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Matrix: (soil/water) SOIL Lab Sample ID: V1BLK0702

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1PBLK02

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. 0 Date Analyzed: 07/02/08 10:34

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.43	5.0		U
127-18-4	Tetrachloroethene	0.97	5.0		U
108-88-3	Toluene	0.86	5.0		U
87-61-6	1,2,3-Trichlorobenzene	0.42	5.0		U
120-82-1	1,2,4-Trichlorobenzene	0.18	5.0		U
71-55-6	1,1,1-Trichloroethane	0.90	5.0		U
79-00-5	1,1,2-Trichloroethane	0.35	5.0		U
79-01-6	Trichloroethene	0.85	5.0		U
76-13-1	Trichlorotrifluoroethane	0.55	5.0		U
75-69-4	Trichlorofluoromethane	0.95	5.0		U
75-01-4	Vinyl chloride	1.1	5.0		U
1330-20-7	Xylene(total)	0.70	5.0		U

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA88279

Lab File ID: V1BFB01 BFB Injection Date: 02/15/08

Instrument ID: VOA1 BFB Injection Time: 0954

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.6
75	30.0 - 60.0% of mass 95	49.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	73.6
175	5.0 - 9.0% of mass 174	5.5 (7.5)1
176	95.0 - 101.0% of mass 174	71.0 (96.5)1
177	5.0 - 9.0% of mass 176	5.1 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1AP9CAL	V1AP9CAL	V1ASTD7	02/15/08	1530
02	V1AP9CAL	V1AP9CAL	V1ASTD6	02/15/08	1605
03	V1AP9CAL	V1AP9CAL	V1ASTD5	02/15/08	1640
04	V1BLK0215LCS	V1BLK0215LCS	V1ICVAP9	02/15/08	1715
05	V1AP9CAL	V1AP9CAL	V1ASTD4	02/15/08	1750
06	V1AP9CAL	V1AP9CAL	V1ASTD3	02/15/08	1825
07	V1AP9CAL	V1AP9CAL	V1ASTD2	02/15/08	1900
08	V1AP9CAL	V1AP9CAL	V1ASTD1	02/15/08	1935
09					
10					
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12					
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21					
22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: SAS No.: NA SDG No.: SDGA90517

Lab File ID: V1BFB01 BFB Injection Date: 07/01/08

Instrument ID: VOA1 BFB Injection Time: 1359

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	24.1
75	30.0 - 60.0% of mass 95	49.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	61.0
175	5.0 - 9.0% of mass 174	4.3 (7.0)1
176	95.0 - 101.0% of mass 174	58.1 (95.2)1
177	5.0 - 9.0% of mass 176	3.5 (6.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		V1STD200PPB	V1STD07	07/01/08	1510
02		V1STD100PPB	V1STD06	07/01/08	1550
03		V1STD50PPB	V1STD05	07/01/08	1629
04		V1BLK0701LCS	V1ICV01	07/01/08	1709
05		V1STD20PPB	V1STD04	07/01/08	1749
06		V1STD10PPB	V1STD03	07/01/08	1828
07		V1STD5PPB	V1STD02	07/01/08	1908
08		V1STD2PPB	V1STD01	07/01/08	1947
09					
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22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Lab File ID: V1BFB01 BFB Injection Date: 07/02/08

Instrument ID: VOA1 BFB Injection Time: 0645

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	24.7
75	30.0 - 60.0% of mass 95	48.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.1
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	54.6
175	5.0 - 9.0% of mass 174	4.1 (7.4)1
176	95.0 - 101.0% of mass 174	54.3 (99.4)1
177	5.0 - 9.0% of mass 176	3.8 (7.0)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V1STD50PPB	V1STD50PPB	V1CCV01	07/02/08	0717
02		V1AP9CCV	V1CCVA9	07/02/08	0757
03	V1BLK0702LCS	V1BLK0702LCS	V1LCS01	07/02/08	0836
04	V1BLK0702	V1BLK0702	V1PBLK02	07/02/08	1034
05	1041SB018 (6	0806311-01	0631101A	07/02/08	1431
06	1041SB019 (6	0806311-02	0631102A	07/02/08	1511
07					
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22					

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V06311

Lab File ID (Standard): V1CCV01 Date Analyzed: 07/02/08

Instrument ID: VOA1 Time Analyzed: 0717

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) Y

		IS1 (FLB) AREA #	RT #	IS2 (CBZ) AREA #	RT #	IS3 (DCB) AREA #	RT #
	12 HOUR STD	1100782	16.37	529643	22.27	419569	26.81
	UPPER LIMIT	2201564	16.87	1059286	22.77	839138	27.31
	LOWER LIMIT	550391	15.87	264822	21.77	209785	26.31
	CLIENT SAMPLE NO.						
01	V1BLK0702LCS	1073205	16.36	534835	22.26	410028	26.82
02	V1BLK0702	1059135	16.38	511801	22.27	393461	26.83
03	1041SB018 (6	1009499	16.38	509839	22.28	375870	26.84
04	1041SB019 (6	1014439	16.38	506051	22.28	375191	26.84
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22							

IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

ORGANIC CASE NARRATIVE
Arcadis - Radford
Workorder: 0807007

Date Sampled	Date Received	Lab ID	Client ID
28-Jun-2008	01-Jul-2008	0807007-01	5GP029(35-38)(062808)
28-Jun-2008	01-Jul-2008	0807007-02	5GP029(15-22)(062808)
28-Jun-2008	01-Jul-2008	0807007-03	5GP031(15-19.5)(062808)
28-Jun-2008	01-Jul-2008	0807007-04	5GPDUP001(15-19.5)(062808)
29-Jun-2008	01-Jul-2008	0807007-05	5GP033(17-24)(062908)
29-Jun-2008	01-Jul-2008	0807007-06	5GP031(35-38)(062908)
29-Jun-2008	01-Jul-2008	0807007-07	5GP030(14-23.5)(062908)
29-Jun-2008	01-Jul-2008	0807007-09	EB001(062908)
30-Jun-2008	01-Jul-2008	0807007-10	TB-4(063008)
30-Jun-2008	01-Jul-2008	0807007-11	5GP032(15-18.5)(0623008)
30-Jun-2008	01-Jul-2008	0807007-12	1041HP019(18-28)(0623008)
30-Jun-2008	01-Jul-2008	0807007-13	5GP034(27-30)(0623008)

Volatiles

Method: The samples were extracted/analyzed for client specified analyte lists by USEPA SW-846 Methods 5030B/8260B (purge and trap followed by capillary column GC/MS) for waters upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- BFB Tuning: All method tuning criteria were met.
- Initial Calibration Criteria: All method calibration criteria were met. Dichlorodifluoromethane exceeded 25% difference with a positive bias at 31.2% in the initial calibration verification. It was not detected in the associated samples.
- Continuing Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded with a positive bias for acetone, 2-butanone and dichlorodifluoromethane but not detected above the quantitation limits. Radford criteria were exceeded with a negative bias for bromomethane, 1,4-dioxane, 1,2,3-trichlorobenzene and 1,2,4-trichlorobenzene at -35.1%, -51.2%, -29.4% and -25.1%, respectively. Results for these analytes are qualified with a "Y" flag on the form Is and in the EDD.
- Method Blank Results: No target analytes were detected in the method blank.
- Surrogate Recoveries: All recoveries were within limits.
- V3BLK0707LCS results: Recovery of acetone exceeded the limit of 140% at 145%. All other recoveries were within limits.
- MS/MSD results: Recoveries of 1,4-dioxane were below the limit of 50% at 44%/(53%). The relative percent difference of chloromethane exceeded the limit of 30 at 37. All other recoveries and relative percent differences were within limits. Analyses of the MS/MSD were started 12 hours 7 minutes/12 hours 38 minutes after the associated tuning standard.
- Internal Standard Area Counts: All internal standard area counts were within limits.
- Dilutions: All samples analyzed without dilution.

Date Sampled	Date Received	Lab ID	Client ID
29-Jun-2008	01-Jul-2008	0807007-08	1041HP001A(062908)

PCBs

Method: The samples were extracted/analyzed by USEPA SW-846 Methods 3510C/8082 (separatory funnel extraction followed by dual capillary column GC/ECD) for waters upon receipt to the laboratory in satisfactory condition.

Comments: The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following notes/exceptions:

- Calibration Criteria: All calibration criteria were met.
- Method Blank Results: No target analytes were detected in the method blank.
- Surrogate Recoveries: All recoveries were within limits.
- LCS/LCSD Results: All recoveries and relative percent differences were within limits.
- MS/MSD results: Not applicable.
- Dilutions: All samples analyzed without dilution.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL) is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL.

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name GPCBRAAR 0047.DF000 / RAAP047

Project Location Radford, Va

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation MC, SG / ARCADIS

0807007

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	VOCs (8260) 40mL VOA	PCBs (8082) 1L Amber HCl	none				Remarks	Total
-01	5GP029(35-38)(062808)	GW	6/28/08 11:10		X						(*) v. turbid, please centerfuge	4
-02	5GP029(15-22)(062808)	GW	6/28/08 14:00		X							4
-03	5GP031(15-19.5)(062808)	GW	6/28/08 15:45		X						(*) turbid, please centerfuge	4
-04	5GPDUP001(15-19.5)(062808)	GW	6/28/08 15:45		X						(*) turbid, please centerfuge	4
-05	5GP033(17-24)(062908)	GW	6/29/08 7:15		X						(*) v. turbid, please centerfuge (*) MS/MSD	12
-06	5GP031(35-38)(062908)	GW	6/29/08 7:35		X						(*) v. turbid, please centerfuge	4
-07	5GP030(14-23.5)(062908)	GW	6/29/08 10:00		X						(*) turbid, please centerfuge	4
-08	1041HP001A(062908)	GW	6/29/08 ~~13:40~~ 14:05			X						2
	~~1041HP019(062908)~~	GW	6/29/08		X							Sg
-09	EB001(062908)	L	6/29/08 15:00		X							3
-10	TB-4(063008)	L	6/30/08 -		X							2
-11	5GP032(15-18.5)(063008)	GW	6/30/08 11:15		X						(*) v. turbid, please centerfuge	4
-12	1041HP019(18-28)(063008)	GW	6/30/08 12:25		X						(*) v. turbid, please centerfuge	4
-13	5GP034(27-30)(063008)	GW	6/30/08 13:00		X						(*) v. turbid, centerfuge	4

Total No. of Bottles/ Containers: 55

Sample Matrix: L = Liquid; S = Solid; A = Air GW = groundwater

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 6/30/08	Time 18:00	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical Labs	Date 7/1/08	Time 9:00	(Yes) No N/A	

Special Instructions/Remarks: (1) please centrifuge turbid samples (2) 24 TAT on all GW samples (3) please contact with any questions

5.1°C

Delivery Method: ☐ In Person ☒ Common Carrier FedEx ☐ Lab Courier ☐ Other

SPECIFY

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0807007 COC ID(s): 063008-1(GW)

Client Arcadis Project Radford

Sample Custodian WS Today's Date 7/1/08

Date/Time Samples Received 7/1/08 09:00
Airbill Number Fedex
Cooler Opened: Date 7/1/08

Chain of custody seal intact?	(Yes)	No
Chain of custody provided?	(Yes)	No
Sample labels present?	(Yes)	No
Bottle labels correspond w/COC	(Yes)	No

Number of Custody Seals on Cooler(s): 1 Seal Date(s): 6/30/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓
Frozen _____

# of Coolers 1 Temp. of Coolers 5.1°C

Condition of Bottles in Shipment: Broken Leaking (Intact) Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP029(35 -38)(062808)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700701

Level: (low/med) LOW Date Sampled: 06/28/08 11:10

% Moisture: not dec. _____ Date Analyzed: 07/01/08 13:07

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	5.7	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	1.1	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP029(35 -38)(062808)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700701

Level: (low/med) LOW Date Sampled: 06/28/08 11:10

% Moisture: not dec. _____ Date Analyzed: 07/01/08 13:07

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		UY
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		UY
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP029(15-22)(062808)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700702

Level: (low/med) LOW Date Sampled: 06/28/08 14:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 13:38

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	2.5	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	1.1	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP029(15-22)(062808)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700702

Level: (low/med) LOW Date Sampled: 06/28/08 14:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 13:38

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		UY
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		UY
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP031(15-19.5)(062808)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700703

Level: (low/med) LOW Date Sampled: 06/28/08 15:45

% Moisture: not dec. _____ Date Analyzed: 07/01/08 14:09

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	4.3	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	51	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP031(15-19.5)(062808)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700703

Level: (low/med) LOW Date Sampled: 06/28/08 15:45

% Moisture: not dec. _____ Date Analyzed: 07/01/08 14:09

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		UY
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		UY
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GPDUP001(15-19.5)(062808

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700704

Level: (low/med) LOW Date Sampled: 06/28/08 15:45

% Moisture: not dec. _____ Date Analyzed: 07/01/08 14:40

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10		U
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	53	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GPDUP001(15-19.5)(062808

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700704

Level: (low/med) LOW Date Sampled: 06/28/08 15:45

% Moisture: not dec. _____ Date Analyzed: 07/01/08 14:40

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP033(17-24)(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700705

Level: (low/med) LOW Date Sampled: 06/29/08 07:15

% Moisture: not dec. _____ Date Analyzed: 07/01/08 15:10

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	4.1	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	34	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/21/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP033(17-24)(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700705

Level: (low/med) LOW Date Sampled: 06/29/08 07:15

% Moisture: not dec. _____ Date Analyzed: 07/01/08 15:10

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP031(35-38)(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700706

Level: (low/med) LOW Date Sampled: 06/29/08 07:35

% Moisture: not dec. _____ Date Analyzed: 07/01/08 15:41

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	11	
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	18	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP031(35 -38)(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700706

Level: (low/med) LOW Date Sampled: 06/29/08 07:35

% Moisture: not dec. _____ Date Analyzed: 07/01/08 15:41

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP030(14-23.5)
(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700707

Level: (low/med) LOW Date Sampled: 06/29/08 10:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 16:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	2.4	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	5.2	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP030(14-23.5)
(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700707

Level: (low/med) LOW Date Sampled: 06/29/08 10:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 16:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB001(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-09

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700709

Level: (low/med) LOW Date Sampled: 06/29/08 15:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 12:06

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	2.3	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		UJ
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	0.19	J
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		UJ
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB001(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-09

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700709

Level: (low/med) LOW Date Sampled: 06/29/08 15:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 12:06

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0	1.5	
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-4(063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-10

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700710

Level: (low/med) LOW Date Sampled: 06/30/08 :

% Moisture: not dec. _____ Date Analyzed: 07/01/08 11:36

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	2.9	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0		U
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-4(063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-10

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700710

Level: (low/med) LOW Date Sampled: 06/30/08 :

% Moisture: not dec. _____ Date Analyzed: 07/01/08 11:36

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP032(15-18.5)(063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-11

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700711

Level: (low/med) LOW Date Sampled: 06/30/08 11:15

% Moisture: not dec. _____ Date Analyzed: 07/01/08 16:41

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	3.0	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	5.4	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP032(15-18.5)(063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-11

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700711

Level: (low/med) LOW Date Sampled: 06/30/08 11:15

% Moisture: not dec. _____ Date Analyzed: 07/01/08 16:41

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP019
(18-28)(063008

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-12

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700712

Level: (low/med) LOW Date Sampled: 06/30/08 12:25

% Moisture: not dec. _____ Date Analyzed: 07/01/08 17:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	2.7	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	31	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

1041HP019
(18-28)(063008

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-12

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700712

Level: (low/med) LOW Date Sampled: 06/30/08 12:25

% Moisture: not dec. _____ Date Analyzed: 07/01/08 17:11

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		UY
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		UY
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
5GP034(27-30)(063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-13

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700713

Level: (low/med) LOW Date Sampled: 06/30/08 13:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 17:42

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10	4.1	J
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		UJ
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0	1.1	
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		UJ
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

JK 7/24/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

5GP034(27-30)(063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-13

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0700713

Level: (low/med) LOW Date Sampled: 06/30/08 13:00

% Moisture: not dec. _____ Date Analyzed: 07/01/08 17:42

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		U?
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		U?
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0	0.26	J
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V3BLK0701LCS	111	106	97	98	0
02	V3BLK0701	118	112	98	100	0
03	TB-4(063008)	116	111	101	99	0
04	EB001(062908	116	114	101	99	0
05	5GP029(35-38	116	111	101	98	0
06	5GP029(15-22	117	114	100	97	0
07	5GP031(15-19	117	113	100	97	0
08	5GPDUP001(15	117	113	100	96	0
09	5GP033(17-24	118	114	100	99	0
10	5GP031(35-38	117	112	99	96	0
11	5GP030(14-23	116	112	100	96	0
12	5GP032(15-18	118	114	99	96	0
13	1041HP019(18	117	113	99	98	0
14	5GP034(27-30	118	116	99	96	0
15	5GP033(17-24	113	108	95	94	0
16	5GP033(17-24	112	105	97	96	0
17						
18						
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27						
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29						
30						

		EL QC LIMITS	SPIKE CONC (ug/L)
SMC1 (DFM)	= Dibromofluoromethane	(85-120)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(80-135)	30
SMC3 (TOL)	= Toluene-d8	(85-115)	30
SMC4 (BFB)	= Bromofluorobenzene	(85-120)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix Spike - Client Sample No.: V3BLK0701

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Acetone	100.0	0.0000	145.2	145*	40-140
Benzene	50.00	0.0000	46.64	93	80-120
Bromochloromethane	50.00	0.0000	50.10	100	65-130
Bromodichloromethane	50.00	0.0000	53.37	107	75-120
Bromoform	50.00	0.0000	43.44	87	70-130
Bromomethane	50.00	0.0000	35.31	71	30-145
2-Butanone	100.0	0.0000	137.5	138	30-150
Carbon disulfide	50.00	0.0000	61.02	122	35-160
Carbon tetrachloride	50.00	0.0000	51.30	103	65-140
Chlorobenzene	50.00	0.0000	43.25	86	80-120
Chloroethane	50.00	0.0000	52.96	106	60-135
Chloroform	50.00	0.0000	50.53	101	65-135
Chloromethane	50.00	0.0000	54.81	110	40-125
Cyclohexane	50.00	0.0000	57.99	116	60-130
Dibromochloromethane	50.00	0.0000	48.18	96	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	41.12	82	50-130
1,2-Dibromoethane	50.00	0.0000	41.77	84	80-120
1,2-Dichlorobenzene	50.00	0.0000	41.79	84	70-120
1,3-Dichlorobenzene	50.00	0.0000	44.85	90	75-125
1,4-Dichlorobenzene	50.00	0.0000	43.06	86	75-125
Dichlorodifluoromethane	50.00	0.0000	69.09	138	30-155
1,1-Dichloroethane	50.00	0.0000	51.90	104	70-135
1,2-Dichloroethane	50.00	0.0000	52.96	106	70-130
1,1-Dichloroethene	50.00	0.0000	51.44	103	70-130
cis-1,2-Dichloroethene	50.00	0.0000	47.92	96	70-125
trans-1,2-Dichloroethen	50.00	0.0000	47.88	96	60-140
1,2-Dichloropropane	50.00	0.0000	49.05	98	75-125
cis-1,3-Dichloropropene	50.00	0.0000	52.90	106	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix Spike - Client Sample No.: V3BLK0701

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	51.96	104	55-140
1,4-Dioxane	1000	0.0000	531.5	53	50-150
Ethylbenzene	50.00	0.0000	45.76	92	75-125
2-Hexanone	100.0	0.0000	110.7	111	55-130
Isopropylbenzene	50.00	0.0000	47.43	95	75-125
Methyl acetate	50.00	0.0000	50.00	100	55-150
Methyl cyclohexane	50.00	0.0000	52.31	105	60-125
Methylene chloride	50.00	0.0000	50.13	100	55-140
4-Methyl-2-pentanone	100.0	0.0000	102.4	102	60-135
Methyl-tert-butyl ether	50.00	0.0000	49.53	99	65-125
Styrene	50.00	0.0000	48.46	97	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	43.99	88	65-130
Tetrachloroethene	55.00	0.0000	52.40	95	45-150
Toluene	50.00	0.0000	44.05	88	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	39.30	79	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	40.29	80	65-135
1,1,1-Trichloroethane	50.00	0.0000	51.10	102	65-130
1,1,2-Trichloroethane	50.00	0.0000	43.04	86	75-125
Trichloroethene	50.00	0.0000	46.60	93	70-125
Trichlorotrifluoroethan	50.00	0.0000	59.19	118	60-130
Trichlorofluoromethane	50.00	0.0000	57.06	114	60-145
Vinyl chloride	50.00	0.0000	53.20	106	50-145
Xylene(total)	150.0	0.0000	133.9	89	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 1 out of 51 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix Spike - Client Sample No.: 5GP033(17-24)(06 Lab Sample ID: 0807007-05

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Acetone	100.0	4.089	95.67	92	40-140
Benzene	50.00	0.0000	48.99	98	80-120
Bromochloromethane	50.00	0.0000	52.38	105	65-130
Bromodichloromethane	50.00	0.0000	56.47	113	75-120
Bromoform	50.00	0.0000	44.54	89	70-130
Bromomethane	50.00	0.0000	25.37	51	30-145
2-Butanone	100.0	0.0000	121.8	122	30-150
Carbon disulfide	50.00	0.0000	65.00	130	35-160
Carbon tetrachloride	50.00	0.0000	55.15	110	65-140
Chlorobenzene	50.00	0.0000	44.66	89	80-120
Chloroethane	50.00	0.0000	56.37	113	60-135
Chloroform	50.00	34.03	89.52	111	65-135
Chloromethane	50.00	0.0000	60.97	122	40-125
Cyclohexane	50.00	0.0000	62.41	125	60-130
Dibromochloromethane	50.00	0.0000	48.79	98	60-135
1,2-Dibromo-3-chloropro	50.00	0.0000	45.53	91	50-130
1,2-Dibromoethane	50.00	0.0000	43.24	86	80-120
1,2-Dichlorobenzene	50.00	0.0000	44.77	90	70-120
1,3-Dichlorobenzene	50.00	0.0000	45.23	90	75-125
1,4-Dichlorobenzene	50.00	0.0000	46.85	94	75-125
Dichlorodifluoromethane	50.00	0.0000	76.04	152	30-155
1,1-Dichloroethane	50.00	0.0000	54.58	109	70-135
1,2-Dichloroethane	50.00	0.0000	56.94	114	70-130
1,1-Dichloroethene	50.00	0.0000	53.63	107	70-130
cis-1,2-Dichloroethene	50.00	0.0000	50.69	101	70-125
trans-1,2-Dichloroethen	50.00	0.0000	50.04	100	60-140
1,2-Dichloropropane	50.00	0.0000	51.06	102	75-125
cis-1,3-Dichloropropene	50.00	0.0000	53.77	108	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix Spike - Client Sample No.: 5GP033(17-24)(06 Lab Sample ID: 0807007-05

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
trans-1,3-Dichloroprope	50.00	0.0000	52.84	106	55-140
1,4-Dioxane	1000	0.0000	443.2	44*	50-150
Ethylbenzene	50.00	0.0000	47.25	94	75-125
2-Hexanone	100.0	0.0000	102.2	102	55-130
Isopropylbenzene	50.00	0.0000	49.50	99	75-125
Methyl acetate	50.00	0.0000	53.44	107	55-150
Methyl cyclohexane	50.00	0.0000	53.75	108	60-125
Methylene chloride	50.00	0.0000	54.36	109	55-140
4-Methyl-2-pentanone	100.0	0.0000	114.6	115	60-135
Methyl-tert-butyl ether	50.00	0.0000	52.01	104	65-125
Styrene	50.00	0.0000	49.92	100	65-135
1,1,2,2-Tetrachloroetha	50.00	0.0000	48.73	97	65-130
Tetrachloroethene	55.00	0.0000	53.20	97	45-150
Toluene	50.00	0.0000	45.88	92	75-120
1,2,3-Trichlorobenzene	50.00	0.0000	40.97	82	55-140
1,2,4-Trichlorobenzene	50.00	0.0000	41.70	83	65-135
1,1,1-Trichloroethane	50.00	0.0000	54.41	109	65-130
1,1,2-Trichloroethane	50.00	0.0000	45.08	90	75-125
Trichloroethene	50.00	0.0000	48.52	97	70-125
Trichlorotrifluoroethan	50.00	0.0000	64.90	130	60-130
Trichlorofluoromethane	50.00	0.0000	62.73	125	60-145
Vinyl chloride	50.00	0.0000	58.90	118	50-145
Xylene(total)	150.0	0.0000	139.6	93	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix Spike - Client Sample No.: 5GP033(17-24)(06 Lab Sample ID: 0807007-05

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acetone	100.0	90.20	86	6	30	40-140
Benzene	50.00	47.85	96	2	30	80-120
Bromochloromethane	50.00	51.86	104	1	30	65-130
Bromodichloromethane	50.00	55.45	111	2	30	75-120
Bromoform	50.00	46.29	92	4	30	70-130
Bromomethane	50.00	36.79	74	37*	30	30-145
2-Butanone	100.0	117.1	117	4	30	30-150
Carbon disulfide	50.00	62.42	125	4	30	35-160
Carbon tetrachloride	50.00	53.08	106	4	30	65-140
Chlorobenzene	50.00	44.83	90	0	30	80-120
Chloroethane	50.00	55.42	111	2	30	60-135
Chloroform	50.00	85.74	103	4	30	65-135
Chloromethane	50.00	58.32	117	4	30	40-125
Cyclohexane	50.00	58.85	118	6	30	60-130
Dibromochloromethane	50.00	49.92	100	2	30	60-135
1,2-Dibromo-3-chloropro	50.00	45.44	91	0	30	50-130
1,2-Dibromoethane	50.00	43.48	87	0	30	80-120
1,2-Dichlorobenzene	50.00	44.58	89	0	30	70-120
1,3-Dichlorobenzene	50.00	45.72	91	1	30	75-125
1,4-Dichlorobenzene	50.00	46.95	94	0	30	75-125
Dichlorodifluoromethane	50.00	70.63	141	7	30	30-155
1,1-Dichloroethane	50.00	53.79	108	1	30	70-135
1,2-Dichloroethane	50.00	55.33	111	3	30	70-130
1,1-Dichloroethene	50.00	51.44	103	4	30	70-130
cis-1,2-Dichloroethene	50.00	49.50	99	2	30	70-125
trans-1,2-Dichloroethen	50.00	48.88	98	2	30	60-140
1,2-Dichloropropane	50.00	50.41	101	1	30	75-125
cis-1,3-Dichloropropene	50.00	53.78	108	0	30	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix Spike - Client Sample No.: 5GP033(17-24)(06 Lab Sample ID: 0807007-05

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
trans-1,3-Dichloroprope	50.00	53.72	107	2	30	55-140
1,4-Dioxane	1000	533.0	53	18	30	50-150
Ethylbenzene	50.00	47.89	96	1	30	75-125
2-Hexanone	100.0	102.6	103	0	30	55-130
Isopropylbenzene	50.00	49.45	99	0	30	75-125
Methyl acetate	50.00	50.33	101	6	30	55-150
Methyl cyclohexane	50.00	51.63	103	4	30	60-125
Methylene chloride	50.00	53.03	106	2	30	55-140
4-Methyl-2-pentanone	100.0	113.6	114	1	30	60-135
Methyl-tert-butyl ether	50.00	51.79	104	0	30	65-125
Styrene	50.00	51.03	102	2	30	65-135
1,1,2,2-Tetrachloroetha	50.00	48.02	96	1	30	65-130
Tetrachloroethene	55.00	53.27	97	0	30	45-150
Toluene	50.00	46.00	92	0	30	75-120
1,2,3-Trichlorobenzene	50.00	42.31	85	3	30	55-140
1,2,4-Trichlorobenzene	50.00	41.62	83	0	30	65-135
1,1,1-Trichloroethane	50.00	52.55	105	3	30	65-130
1,1,2-Trichloroethane	50.00	45.46	91	1	30	75-125
Trichloroethene	50.00	47.17	94	3	30	70-125
Trichlorotrifluoroethan	50.00	60.50	121	7	30	60-130
Trichlorofluoromethane	50.00	58.90	118	6	30	60-145
Vinyl chloride	50.00	55.98	112	5	30	50-145
Xylene(total)	150.0	141.6	94	1	30	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 51 outside limits
Spike Recovery: 1 out of 102 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V3BLK0701

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Lab File ID: V3BLK01 Lab Sample ID: V3BLK0701

Date Analyzed: 07/01/08 Time Analyzed: 1005

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA3

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V3BLK0701LCS	V3BLK0701LCS	V3LCS01	0837
02	TB-4(063008)	0807007-10	0700710	1136
03	EB001(062908	0807007-09	0700709	1206
04	5GP029(35-38	0807007-01	0700701	1307
05	5GP029(15-22	0807007-02	0700702	1338
06	5GP031(15-19	0807007-03	0700703	1409
07	5GPDUP001(15	0807007-04	0700704	1440
08	5GP033(17-24	0807007-05	0700705	1510
09	5GP031(35-38	0807007-06	0700706	1541
10	5GP030(14-23	0807007-07	0700707	1611
11	5GP032(15-18	0807007-11	0700711	1641
12	1041HP019(18	0807007-12	0700712	1711
13	5GP034(27-30	0807007-13	0700713	1742
14	5GP033(17-24	0807007-05MS	0700705M	1914
15	5GP033(17-24	0807007-05MSD	0700705S	1945
16				
17				
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COMMENTS:

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V3BLK0701

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: V3BLK0701

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V3BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 07/01/08 10:05

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
67-64-1	Acetone	1.7	10		U
71-43-2	Benzene	0.12	1.0		U
74-97-5	Bromochloromethane	0.15	1.0		U
75-27-4	Bromodichloromethane	0.12	1.0		U
75-25-2	Bromoform	0.13	1.0		U
74-83-9	Bromomethane	0.13	1.0		U
78-93-3	2-Butanone	1.4	10		U
75-15-0	Carbon disulfide	0.15	1.0		U
56-23-5	Carbon tetrachloride	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
75-00-3	Chloroethane	0.14	1.0		U
67-66-3	Chloroform	0.13	1.0		U
74-87-3	Chloromethane	0.28	1.0		U
110-82-7	Cyclohexane	0.12	1.0		U
124-48-1	Dibromochloromethane	0.14	1.0		U
96-12-8	1,2-Dibromo-3-chloropropane	0.090	1.0		U
106-93-4	1,2-Dibromoethane	0.14	1.0		U
95-50-1	1,2-Dichlorobenzene	0.11	1.0		U
541-73-1	1,3-Dichlorobenzene	0.38	1.0		U
106-46-7	1,4-Dichlorobenzene	0.10	1.0		U
75-71-8	Dichlorodifluoromethane	0.25	1.0		U
75-34-3	1,1-Dichloroethane	0.11	1.0		U
107-06-2	1,2-Dichloroethane	0.13	1.0		U
75-35-4	1,1-Dichloroethene	0.13	1.0		U
156-59-2	cis-1,2-Dichloroethene	0.14	1.0		U
156-60-5	trans-1,2-Dichloroethene	0.15	1.0		U
78-87-5	1,2-Dichloropropane	0.11	1.0		U
10061-01-5	cis-1,3-Dichloropropene	0.080	1.0		U
10061-02-6	trans-1,3-Dichloropropene	0.12	1.0		U
123-91-1	1,4-Dioxane	0.20	10		U
100-41-4	Ethylbenzene	0.35	1.0		U
591-78-6	2-Hexanone	0.18	5.0		U
98-82-8	Isopropylbenzene	0.11	1.0		U
79-20-9	Methyl acetate	0.36	1.0		U
108-87-2	Methyl cyclohexane	0.12	1.0		U
75-09-2	Methylene chloride	0.23	1.0		U
108-10-1	4-Methyl-2-pentanone	0.35	5.0		U
1634-04-4	Methyl-tert-butyl ether	0.10	1.0		U
100-42-5	Styrene	0.090	1.0		U

7/2/08

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V3BLK0701

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Matrix: (soil/water) WATER Lab Sample ID: V3BLK0701

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V3BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 07/01/08 10:05

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
79-34-5	1,1,2,2-Tetrachloroethane	0.13	1.0		U
127-18-4	Tetrachloroethene	0.10	1.0		U
108-88-3	Toluene	0.16	1.0		U
87-61-6	1,2,3-Trichlorobenzene	0.57	1.0		UY
120-82-1	1,2,4-Trichlorobenzene	0.57	1.0		UY
71-55-6	1,1,1-Trichloroethane	0.12	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U
79-01-6	Trichloroethene	0.23	1.0		U
76-13-1	Trichlorotrifluoroethane	0.11	1.0		U
75-69-4	Trichlorofluoromethane	0.12	1.0		U
75-01-4	Vinyl chloride	0.20	1.0		U
1330-20-7	Xylene(total)	0.47	1.0		U

7/2/08

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: EL Case No.: NA SAS No.: NA SDG No.: SDGA04575

Lab File ID: V3BFB01 BFB Injection Date: 06/13/08

Instrument ID: VOA3 BFB Injection Time: 1004

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.5
75	30.0 - 60.0% of mass 95	42.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.2
173	Less than 2.0% of mass 174	0.6 (0.6)1
174	Greater than 50.0% of mass 95	88.2
175	5.0 - 9.0% of mass 174	6.3 (7.1)1
176	95.0 - 101.0% of mass 174	84.0 (95.3)1
177	5.0 - 9.0% of mass 176	5.9 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		V3STD200PPB	V3STD09	06/13/08	1105
02		V3STD100PPB	V3STD08	06/13/08	1135
03		V3STD50PPB	V3STD07	06/13/08	1204
04		V3STD20PPB	V3STD06	06/13/08	1305
05		V3STD10PPB	V3STD05	06/13/08	1335
06		V3STD2PPB	V3STD04	06/13/08	1405
07		V3STD1PPB	V3STD03	06/13/08	1435
08		V3STD0.5PPB	V3STD02	06/13/08	1504
09		V3STD0.25PPB	V3STD01	06/13/08	1534
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11					
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21					
22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Lab File ID: V3BFB01 BFB Injection Date: 07/01/08

Instrument ID: VOA3 BFB Injection Time: 0707

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.7
75	30.0 - 60.0% of mass 95	42.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.6 (0.6)1
174	Greater than 50.0% of mass 95	96.7
175	5.0 - 9.0% of mass 174	6.5 (6.8)1
176	95.0 - 101.0% of mass 174	92.8 (96.0)1
177	5.0 - 9.0% of mass 176	6.1 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	V3STD50PPB	V3STD50PPB	V3CCV01	07/01/08	0738
02	V3AP9CCV	V3AP9CCV	V3CCVA9	07/01/08	0807
03	V3BLK0701LCS	V3BLK0701LCS	V3LCS01	07/01/08	0837
04	V3BLK0701	V3BLK0701	V3BLK01	07/01/08	1005
05	TB-4(063008)	0807007-10	0700710	07/01/08	1136
06	EB001(062908	0807007-09	0700709	07/01/08	1206
07	5GP029(35-38	0807007-01	0700701	07/01/08	1307
08	5GP029(15-22	0807007-02	0700702	07/01/08	1338
09	5GP031(15-19	0807007-03	0700703	07/01/08	1409
10	5GPDUP001(15	0807007-04	0700704	07/01/08	1440
11	5GP033(17-24	0807007-05	0700705	07/01/08	1510
12	5GP031(35-38	0807007-06	0700706	07/01/08	1541
13	5GP030(14-23	0807007-07	0700707	07/01/08	1611
14	5GP032(15-18	0807007-11	0700711	07/01/08	1641
15	1041HP019(18	0807007-12	0700712	07/01/08	1711
16	5GP034(27-30	0807007-13	0700713	07/01/08	1742
17	5GP033(17-24	0807007-05MS	0700705M	07/01/08	1914
18	5GP033(17-24	0807007-05MSD	0700705S	07/01/08	1945
19					
20					
21					
22					

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.V07007

Lab File ID (Standard): V3CCV01 Date Analyzed: 07/01/08

Instrument ID: VOA3 Time Analyzed: 0738

GC Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1(FLB) AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	1043338	13.27	486010	16.74	627233	18.78
	UPPER LIMIT	2086676	13.77	972020	17.24	1254466	19.28
	LOWER LIMIT	521669	12.77	243005	16.24	313617	18.28
	CLIENT SAMPLE NO.						
01	V3BLK0701LCS	1049755	13.27	487315	16.73	616841	18.78
02	V3BLK0701	971918	13.27	455568	16.74	572602	18.78
03	TB-4(063008)	959218	13.27	427329	16.74	533922	18.78
04	EB001(062908	976994	13.27	427102	16.74	534415	18.78
05	5GP029(35-38	994681	13.27	434727	16.74	533089	18.78
06	5GP029(15-22	985711	13.27	434686	16.74	533631	18.78
07	5GP031(15-19	948765	13.27	436041	16.74	532211	18.79
08	5GPDUP001(15	964662	13.27	425794	16.74	527717	18.78
09	5GP033(17-24	950130	13.27	419652	16.74	527245	18.79
10	5GP031(35-38	948268	13.27	424590	16.74	518356	18.79
11	5GP030(14-23	936927	13.27	420613	16.74	518798	18.79
12	5GP032(15-18	935941	13.27	420766	16.74	517544	18.78
13	1041HP019(18	930217	13.27	430732	16.74	521213	18.79
14	5GP034(27-30	924089	13.27	417993	16.74	514762	18.79
15	5GP033(17-24	999044	13.27	470719	16.74	585809	18.79
16	5GP033(17-24	1039684	13.27	474678	16.74	597948	18.79
17							
18							
19							
20							
21							
22							

IS1 (FLB) = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 1
PESTA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
1041HP001 A(062908)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: EL Case No.: SAS No.: NA SDG No.: ARC.P07007

Matrix: (soil/water) WATER Lab Sample ID: 0807007-08

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 009F0901

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 06/29/08 14:05

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/01/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 07/01/08 18:41

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.50		U
11104-28-2	PCB-1221	0.12	0.50		U
11141-16-5	PCB-1232	0.12	0.50		U
53469-21-9	PCB-1242	0.12	0.50		U
12672-29-6	PCB-1248	0.12	0.50		U
11097-69-1	PCB-1254	0.12	0.50		U
11096-82-5	PCB-1260	0.12	0.50		U

FORM 2
WATER PESTICIDE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: EL Case No.: SAS No.: NA SDG No.: ARC.P07007

Column(1): ZB MR-1 ID: 0.32 (mm) Column(2): ZB MR-2 ID: 0.32 (mm)

	CLIENT SAMPLE NO.	S1 1 %REC #	S1 2 %REC #	S2 1 %REC #	S2 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PW1BLK0701	70	65	83	87			0
02	PW1BLK0701LC	73	68	94	102			0
03	PW1BLK0701LC	74	68	86	92			0
04	1041HP001A(0	76	73	77	84			0
05								
06								
07								
08								
09								
10								
11								
12								
13								
14								
15								
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30								

		EL QC LIMITS	SPIKE CONC (ug/L)
S1	= TCMX	(25-120)	0.50
S2	= DCB	(25-130)	0.50

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate results reported from a diluted analysis

FORM 3
WATER PESTICIDE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: EL Case No.: SAS No.: NA SDG No.: ARC.P07007

Matrix Spike - Client Sample No.: PW1BLK0701

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
PCB-1016	5.000	0.0000	4.645	93	30-140
PCB-1260	5.000	0.0000	4.946	99	40-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	5.000	4.504	90	3	30	30-140
PCB-1260	5.000	4.658	93	6	30	40-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 4
PESTICIDE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PW1BLK0701

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: EL Case No.: SAS No.: NA SDG No.: ARC.P07007

Lab Sample ID: PW1BLK0701 Lab File ID: 006F0601

Matrix (soil/water) WATER Extraction: (SepF/Cont/Sonc/Soxh) SEPF

Sulfur Cleanup (Y/N) N Date Extracted: 07/01/08

Date Analyzed (1): 07/01/08 Date Analyzed (2): 07/01/08

Time Analyzed (1): 1745 Time Analyzed (2): 1745

Instrument ID (1): ECD3 Instrument ID (2): ECD3

Column (1): ZB MR-1 ID: 0.32(mm) Column (2): ZB MR-2 ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	PW1BLK0701LC	PW1BLK0701LCS	07/01/08	07/01/08
02	PW1BLK0701LC	PW1BLK0701LCSD	07/01/08	07/01/08
03	1041HP001A(0	0807007-08	07/01/08	07/01/08
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

COMMENTS: _____

FORM 1
PESTA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW1BLK0701

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: EL Case No.: SAS No.: NA SDG No.: ARC.P07007

Matrix: (soil/water) WATER Lab Sample ID: PW1BLK0701

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 006F0601

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/01/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 07/01/08 17:45

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.50		U
11104-28-2	PCB-1221	0.12	0.50		U
11141-16-5	PCB-1232	0.12	0.50		U
53469-21-9	PCB-1242	0.12	0.50		U
12672-29-6	PCB-1248	0.12	0.50		U
11097-69-1	PCB-1254	0.12	0.50		U
11096-82-5	PCB-1260	0.12	0.50		U

Analytical Report

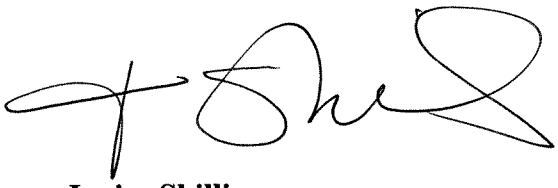
Main Data Package – Inorganic

Arcadis

Project # GP08RAAP.0047.DG001

WO #0907062

Empirical Laboratories, LLC.



Janice Shilling
Project Manager

July 24, 2009

THIS DOCUMENT MEETS NELAC STANDARDS
NELAC Certification #TN473

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WO #0907062

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INORGANIC CASE NARRATIVE
Arcadis
SDG# Radford
Work Order# 0907062
July, 2009

Empirical Laboratories ID	Client ID
0907062-01	1549HP010 (20-30) (070809)
0907062-02	1549HP009 (19-29) (070809)
0907062-03	1041HP020 (25-30) (070809)
0907062-04	1041HP021 (21-26) (070809)
0907062-05	1041HPDUP002 (21-36) (070809)

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Betty DeVille
Inorganic Lab Manager

Methods:

The samples were digested for total and soluble ICAP metals using USEPA SW846 method 3005A and analyzed by 6010B. Total and Soluble mercury was digested and analyzed by 7470A. Note: The "U" flag on the forms indicates that the analyte is reported down to the MDL. The "J" flag indicates that the analyte result is between the laboratory MDL and the laboratory RL.

NOTE: The total samples were 10 to 30% solid material and were received preserved.

Specific Comments:

All analyses performed by the Inorganic section were completed meeting satisfactorily the corresponding specifications for Quality Control with the following exceptions:

I. ICAP Metals

A. Initial Calibration Verification (ICV)
Specification Limits (90 to 110%)

1. The ICV in the first ICAP analysis was out of the specification limits for calcium at 112.5%. This ICV impacts the soluble samples.

B. Continuing Calibration Verification (CCV)
Specification Limits (90 to 110%)

1. The first through the third CCV was out of the specification limits for calcium at 113.6% in CCV1 and at 111.1% in CCV3, for iron at 113.5,

110.6 and 111.0%. These CCV's impacted the soluble samples.

2. The second and the fouth CCV in the second ICAP analysis was out of the specification limits for calcium at 111.5%, for manganese at 117.6% and for sodium at 113.7% in CCV2 and for silver at 88.5% in CCV4. The second CCV impacted the total samples. The fourth CCV impacted 1549HP009 (19-29) (070809).

C. Preparation Blank (PBW)
Specification Limits (<1/2 RL)

1. The preparation blank was out of the specification limits for zinc at 46.544 ug/L. All samples with concentrations less than the MDL were reported with this PBW. All impacted samples with concentrations above the MDL were redigested and reanalyzed.

0907062

Empirical Laboratories, LLC

Client: Arcadis (A285)
Project: Radford Army Ammunition Plant

Project Manager: Janice Shilling
Project Number: ARC_Radford

Report To:
Arcadis (A285)
Jace'que Powell
640 Plaza Drive Suite 130
Highlands Ranch, CO 80129
Phone: (720) 344-3500
Fax: (000) 000-0000

Invoice To:
Arcadis (A285)
Joyce Williams
640 Plaza Drive Suite 130
Highlands Ranch, CO 80129
Phone :(720) 344-3764
Fax: (000) 000-0000

Date Due: 07/23/2009 16:00 (10 day TAT)
Received By: William Schwab
Logged In By: William Schwab
Date Received: 07/09/2009 08:15
Date Logged In: 07/09/2009 14:21

Samples Received at: **4.3°C**
Custody Seals Yes Received On Ice Yes
Containers Intact Yes
COC/Labels Agree Yes
Preservation Confirm Yes

Analysis	Due	TAT	Expires	Comments
0907062-01 1549HP010(20-30)(070809) [Water] Sampled 07/08/2009 10:30				
Eastern				
MET_TAL_DISS_METALS_VAR	07/20/2009 14:00	10	01/04/2010 09:30	TAL. FIELD FILTERED & PRESERVED!
MET_TAL_METALS_VAR	07/20/2009 14:00	10	01/04/2010 09:30	TAL
0907062-02 1549HP009(19-29)(070809) [Water] Sampled 07/08/2009 11:15				
Eastern				
MET_TAL_DISS_METALS_VAR	07/20/2009 14:00	10	01/04/2010 10:15	TAL. FIELD FILTERED & PRESERVED!
MET_TAL_METALS_VAR	07/20/2009 14:00	10	01/04/2010 10:15	TAL
0907062-03 1041HP020(25-30)(070809) [Water] Sampled 07/08/2009 12:15				
Eastern				
MET_TAL_METALS_VAR	07/20/2009 14:00	10	01/04/2010 11:15	TAL. POSSIBLE HIGH TURBIDITY!!!
MET_TAL_DISS_METALS_VAR	07/20/2009 14:00	10	01/04/2010 11:15	TAL. FIELD FILTERED & PRESERVED!
0907062-04 1041HP021(21-26)(070809) [Water] Sampled 07/08/2009 13:00				
Eastern				
MET_TAL_DISS_METALS_VAR	07/20/2009 14:00	10	01/04/2010 12:00	TAL. FIELD FILTERED & PRESERVED!
MET_TAL_METALS_VAR	07/20/2009 14:00	10	01/04/2010 12:00	TAL
0907062-05 1041HPDUP002(21-26)(070809) [Water] Sampled 07/08/2009 12:00				
Eastern				
MET_TAL_DISS_METALS_VAR	07/20/2009 14:00	10	01/04/2010 11:00	TAL. FIELD FILTERED & PRESERVED!
MET_TAL_METALS_VAR	07/20/2009 14:00	10	01/04/2010 11:00	TAL

Reviewed By _____ Date _____

0907062

Empirical Laboratories, LLC

Client: Arcadis (A285)
Project: Radford Army Ammunition Plant

Project Manager: Janice Shilling
Project Number: ARC_Radford

Analysis groups included in this work order

MET TAL DISS METALS VAR

MET ICP 6010B DIS C(	MET 7470 DIS MERCU	MET ICP 6010B DIS TI	MET ICP 6010B DIS S(
MET ICP 6010B DIS SI	MET ICP 6010B DIS SI	MET ICP 6010B DIS P(	MET ICP 6010B DIS NI
MET ICP 6010B DIS M	MET ICP 6010B DIS M	MET ICP 6010B DIS V.	MET ICP 6010B DIS IR
MET ICP 6010B DIS ZI	MET ICP 6010B DIS C(	MET ICP 6010B DIS CI	MET ICP 6010B DIS C.
MET ICP 6010B DIS C.	MET ICP 6010B DIS BI	MET ICP 6010B DIS B.	MET ICP 6010B DIS AI
MET ICP 6010B DIS AI	MET ICP 6010B DIS AI	MET ICP 6010B DIS LI	

MET TAL METALS VAR

MET ICP 6010B COPPE	MET ICP 6010B VANAI	MET ICP 6010B THALI	MET ICP 6010B SODIU
MET ICP 6010B SILVEI	MET ICP 6010B SELEN	MET ICP 6010B POTAS	MET ICP 6010B NICKE
MET ICP 6010B MANG	MET ICP 6010B MAGN	MET 7470 MERCURY	MET ICP 6010B IRON
MET ICP 6010B ZINC	MET ICP 6010B COBAI	MET ICP 6010B CHROI	MET ICP 6010B CALCI
MET ICP 6010B CADM	MET ICP 6010B BERYI	MET ICP 6010B BARIU	MET ICP 6010B ARSEI
MET ICP 6010B ANTIM	MET ICP 6010B ALUM	MET ICP 6010B LEAD	

Reviewed By

Date

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name GP08RAAP.0047.DG001

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck (410.923.7834)

Sampler(s)/Affiliation SG / ARCADIS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: TAL Metals - total, 250mL plastic	TAL Metals - dissolved * field filtered *, HNO3, 250mL Plastic	HNO3				Remarks	Total
1549HP010(20-30)(070809)	GW	7/8/09 | 10:30		X	X					-01	2
1549HP009(19-29)(070809)	GW	7/8/09 | 11:15		X	X					-02	2
1041HP020(25-30)(070809)	GW	7/8/09 | 12:15		X	X				-03	Leave to settle turbidity, 2 unfiltered bottles submitted	3
1041HP021(24-26)(070809)	GW	7/8/09 | 13:00		X	X					-04	2
1041HPDUP002(21-26)(070809)	GW	7/8/09 | 12:00		X	X					-05	2
										0907062	

Total No. of Bottles/ Containers: 11

Sample Matrix: L = Liquid; S = Solid; A = Air GW = groundwater

					Seal Intact?
Relinquished by: Sandra Grasowski	Organization: ARCADIS	Date 7/8/09	Time 16:30		
Received by:	Organization:	Date / /	Time		Yes No N/A
Relinquished by:	Organization:	Date / /	Time		Seal Intact?
Received by:	Organization: Empirical	Date 7/9/09	Time 08:15		Yes No N/A

Special Instructions/Remarks: (1) 10 day turn around (2) Level II data validation (3) please contact Jacque Powell with questions

Delivery Method: ☐ In Person ☒ Common Carrier FedEx ☐ Lab Courier ☐ Other _____

SPECIFY

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0907062 Number of Coolers: 1 of 1

Client: Arcadis Project: Radford

Date/Time Received: **07/09/09 08:15** Date cooler(s) opened: **07/09/09**

Opened By (print): **WILLIAM SCHWAB** (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 6275

2. Were custody seals on outside of cooler(s)? ..... (Yes) No

How many: 1 Seal date: 7/8/09 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival?	(Yes)	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	(Yes)	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	(Yes)	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	(Yes)	No	N/A
7. Was project identifiable from custody papers?	(Yes)	No	N/A
8. If required, was enough ice present in the cooler(s)?	(Yes)	No	N/A

Type of Coolant: (WET) DRY BLUE NONE Temperature of Samples upon Receipt: 4.3°C

Dates samples were logged-in: **07/09/09**

9. Initial this form to acknowledge login of sample(s): (Name): **WILLIAM SCHWAB** (Initial): WS

10. Were all bottle lids intact and sealed tightly?	(Yes)	No	N/A
11. Did all bottles arrive unbroken?	(Yes)	No	N/A
12. Was all required bottle label information complete?	(Yes)	No	N/A
13. Did all bottle labels agree with custody papers?	(Yes)	No	N/A
14. Were correct containers used for the analyses indicated?	(Yes)	No	N/A
15. Were preservative levels correct in all applicable sample containers?	(Yes)	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	(N/A)
17. Was sufficient amount of sample sent for the analyses required?	(Yes)	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	(N/A)

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549HP010(20-30)(070809)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-01

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1460000			P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	935			P
7440-39-3	Barium	5320			P
7440-41-7	Beryllium	102			P
7440-43-9	Cadmium	21.7	J		P
7440-70-2	Calcium	212000			P
7440-47-3	Chromium	1690			P
7440-48-4	Cobalt	1090			P
7440-50-8	Copper	2450			P
7439-89-6	Iron	3530000			P
7439-92-1	Lead	786			P
7439-95-4	Magnesium	1080000			P
7439-96-5	Manganese	69100			P
7439-97-6	Mercury	2.6			AV
7440-02-0	Nickel	3050			P
7440-09-7	Potassium	55800			P
7782-49-2	Selenium	30.0	U		P
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	13300			P
7440-28-0	Thallium	30.0	U		P
7440-62-2	Vanadium	2930			P
7440-66-6	Zinc	12300			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549HP010(20-30)(070809) Soluble

SMO 2/23/09

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-01Soluble

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	50.0	U		P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	3.0	U		P
7440-39-3	Barium	84.4			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	71100			P
7440-47-3	Chromium	2.0	U		P
7440-48-4	Cobalt	5.0	U		P
7440-50-8	Copper	5.0	U		P
7439-89-6	Iron	30.0	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	29900			P
7439-96-5	Manganese	172			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	3.0	U		P
7440-09-7	Potassium	3380	J		P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	11900			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	5.0	U		P
7440-66-6	Zinc	8.4	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549HP009(19-29) (070809)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-02

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3600000			P
7440-36-0	Antimony	250	U		P
7440-38-2	Arsenic	1380			P
7440-39-3	Barium	11500			P
7440-41-7	Beryllium	212			P
7440-43-9	Cadmium	123	J		P
7440-70-2	Calcium	530000			P
7440-47-3	Chromium	5070			P
7440-48-4	Cobalt	2960			P
7440-50-8	Copper	4890			P
7439-89-6	Iron	6150000			P
7439-92-1	Lead	2100			P
7439-95-4	Magnesium	2780000			P
7439-96-5	Manganese	95700			P
7439-97-6	Mercury	5.0			AV
7440-02-0	Nickel	6390			P
7440-09-7	Potassium	180000			P
7782-49-2	Selenium	150	U		P
7440-22-4	Silver	50.0	U		P
7440-23-5	Sodium	30200			P
7440-28-0	Thallium	150	U		P
7440-62-2	Vanadium	5950			P
7440-66-6	Zinc	4990			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1549HP009(19-29)(070809) Soluble

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-02Soluble

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	50.0	U		P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	3.0	U		P
7440-39-3	Barium	96.5			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	60200			P
7440-47-3	Chromium	2.0	U		P
7440-48-4	Cobalt	5.0	U		P
7440-50-8	Copper	5.0	U		P
7439-89-6	Iron	30.0	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	28600			P
7439-96-5	Manganese	164			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	3.8	J		P
7440-09-7	Potassium	3570	J		P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	21600			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	5.0	U		P
7440-66-6	Zinc	5.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP020(25-30)(070809)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-03

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	349000			P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	124			P
7440-39-3	Barium	4220			P
7440-41-7	Beryllium	42.0			P
7440-43-9	Cadmium	10.2	J		P
7440-70-2	Calcium	67200			P
7440-47-3	Chromium	716			P
7440-48-4	Cobalt	1080			P
7440-50-8	Copper	1040			P
7439-89-6	Iron	2000000			P
7439-92-1	Lead	220			P
7439-95-4	Magnesium	186000			P
7439-96-5	Manganese	57800			P
7439-97-6	Mercury	0.47			AV
7440-02-0	Nickel	2340			P
7440-09-7	Potassium	23700			P
7782-49-2	Selenium	30.0	U		P
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	20700			P
7440-28-0	Thallium	30.0	U		P
7440-62-2	Vanadium	1390			P
7440-66-6	Zinc	1800			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP020(25-30)(070809) Soluble

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-03Soluble

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13100			P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	12.9			P
7440-39-3	Barium	184			P
7440-41-7	Beryllium	1.4	J		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	18800			P
7440-47-3	Chromium	24.0			P
7440-48-4	Cobalt	33.0			P
7440-50-8	Copper	37.0			P
7439-89-6	Iron	82600			P
7439-92-1	Lead	7.5			P
7439-95-4	Magnesium	13000			P
7439-96-5	Manganese	2180			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	83.5			P
7440-09-7	Potassium	8210			P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	19400			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	53.0			P
7440-66-6	Zinc	61.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP021(21-26)(070809)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

SDG 7/23/09

Matrix (soil/water): WATER Lab Sample ID: 0907062-04

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1090000			P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	188			P
7440-39-3	Barium	6420			P
7440-41-7	Beryllium	54.4			P
7440-43-9	Cadmium	14.6	J		P
7440-70-2	Calcium	348000			P
7440-47-3	Chromium	2720			P
7440-48-4	Cobalt	1090			P
7440-50-8	Copper	852			P
7439-89-6	Iron	2570000			P
7439-92-1	Lead	230			P
7439-95-4	Magnesium	823000			P
7439-96-5	Manganese	41300			P
7439-97-6	Mercury	0.52			AV
7440-02-0	Nickel	3220			P
7440-09-7	Potassium	134000			P
7782-49-2	Selenium	30.0	U		P
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	15500			P
7440-28-0	Thallium	30.0	U		P
7440-62-2	Vanadium	2700			P
7440-66-6	Zinc	2190			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HP021(21-26)(070809) Soluble

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-04Soluble

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	50.0	U		P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	3.0	U		P
7440-39-3	Barium	52.9			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	20900			P
7440-47-3	Chromium	2.0	U		P
7440-48-4	Cobalt	5.0	U		P
7440-50-8	Copper	5.0	U		P
7439-89-6	Iron	30.0	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	11400			P
7439-96-5	Manganese	133			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	3.0	U		P
7440-09-7	Potassium	6840			P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	14800			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	5.0	U		P
7440-66-6	Zinc	5.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HPDUP002(21-26)(070809)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

SDG 7/23/09

Matrix (soil/water): WATER Lab Sample ID: 0907062-05

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1020000			P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	157			P
7440-39-3	Barium	5880			P
7440-41-7	Beryllium	50.7			P
7440-43-9	Cadmium	16.8	J		P
7440-70-2	Calcium	317000			P
7440-47-3	Chromium	2520			P
7440-48-4	Cobalt	994			P
7440-50-8	Copper	826			P
7439-89-6	Iron	2330000			P
7439-92-1	Lead	219			P
7439-95-4	Magnesium	747000			P
7439-96-5	Manganese	37800			P
7439-97-6	Mercury	0.47			AV
7440-02-0	Nickel	2860			P
7440-09-7	Potassium	128000			P
7782-49-2	Selenium	30.0	U		P
7440-22-4	Silver	10.0	U		P
7440-23-5	Sodium	16000			P
7440-28-0	Thallium	30.0	U		P
7440-62-2	Vanadium	2510			P
7440-66-6	Zinc	1950			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1041HPDUP002(21-26)(070809) Soluble

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Matrix (soil/water): WATER Lab Sample ID: 0907062-05Soluble

Level (low/med): LOW Date Received: 07/09/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	50.0	U		P
7440-36-0	Antimony	5.0	U		P
7440-38-2	Arsenic	3.0	U		P
7440-39-3	Barium	53.8			P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	1.0	U		P
7440-70-2	Calcium	20600			P
7440-47-3	Chromium	2.0	U		P
7440-48-4	Cobalt	5.0	U		P
7440-50-8	Copper	5.0	U		P
7439-89-6	Iron	30.0	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	11400			P
7439-96-5	Manganese	130			P
7439-97-6	Mercury	0.080	U		AV
7440-02-0	Nickel	3.8	J		P
7440-09-7	Potassium	6960			P
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	1.0	U		P
7440-23-5	Sodium	15100			P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	5.0	U		P
7440-66-6	Zinc	5.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum	10000.0	9772.80	97.7	10000.0	10284.00	102.8	10020.00	100.2	P
Antimony	1000.0	989.94	99.0	1000.0	1006.50	100.6	993.80	99.4	P
Arsenic	1000.0	981.77	98.2	1000.0	1037.40	103.7	1019.60	102.0	P
Barium	1000.0	1020.70	102.1	1000.0	1020.80	102.1	1004.20	100.4	P
Beryllium	1000.0	1031.20	103.1	1000.0	1081.70	108.2	1053.80	105.4	P
Cadmium	1000.0	978.67	97.9	1000.0	1020.50	102.0	1002.70	100.3	P
Calcium	50000.0	56228.00	112.5	50000.0	56810.00	113.6	54915.00	109.8	P
Chromium	1000.0	996.46	99.6	1000.0	1019.40	101.9	999.54	100.0	P
Cobalt	1000.0	975.83	97.6	1000.0	995.27	99.5	980.24	98.0	P
Copper	1000.0	1061.30	106.1	1000.0	1052.80	105.3	1034.90	103.5	P
Iron	10000.0	11039.00	110.4	10000.0	11352.00	113.5	11062.00	110.6	P
Lead	1000.0	949.45	94.9	1000.0	987.42	98.7	972.74	97.3	P
Magnesium	50000.0	49049.00	98.1	50000.0	50741.00	101.5	49077.00	98.2	P
Manganese	1000.0	1051.20	105.1	1000.0	1089.00	108.9	1060.80	106.1	P
Mercury	4.0	3.84	96.0	4.0	4.13	103.2	4.10	102.5	AV
Nickel	1000.0	1013.30	101.3	1000.0	1026.70	102.7	1012.90	101.3	P
Potassium	10000.0	9650.60	96.5	10000.0	9909.80	99.1	9719.70	97.2	P
Selenium	1000.0	950.21	95.0	1000.0	999.10	99.9	979.51	98.0	P
Silver	500.0	484.70	96.9	500.0	486.90	97.4	478.89	95.8	P
Sodium	50000.0	53881.00	107.8	50000.0	54200.00	108.4	52622.00	105.2	P
Thallium	1000.0	970.25	97.0	1000.0	1019.30	101.9	1004.40	100.4	P
Vanadium	1000.0	992.01	99.2	1000.0	1023.10	102.3	1001.20	100.1	P
Zinc	1000.0	923.69	92.4	1000.0	990.80	99.1	973.53	97.4	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Aluminum				10000.0	10222.00	102.2			P
Antimony				1000.0	1013.20	101.3			P
Arsenic				1000.0	1032.70	103.3			P
Barium				1000.0	1035.70	103.6			P
Beryllium				1000.0	1068.10	106.8			P
Cadmium				1000.0	1038.80	103.9			P
Calcium				50000.0	55558.00	111.1			P
Chromium				1000.0	1005.60	100.6			P
Cobalt				1000.0	996.02	99.6			P
Copper				1000.0	1045.50	104.6			P
Iron				10000.0	11101.00	111.0			P
Lead				1000.0	994.95	99.5			P
Magnesium				50000.0	50182.00	100.4			P
Manganese				1000.0	1079.10	107.9			P
Mercury				2.0	2.01	100.5	2.03	101.5	AV
Nickel				1000.0	1017.20	101.7			P
Potassium				10000.0	10000.00	100.0			P
Selenium				1000.0	1018.30	101.8			P
Silver				500.0	487.24	97.4			P
Sodium				50000.0	53824.00	107.6			P
Thallium				1000.0	1012.10	101.2			P
Vanadium				1000.0	1017.90	101.8			P
Zinc				1000.0	1002.90	100.3			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Aluminum	10000.0	10284.00	102.8	10000.0	10114.00	101.1	10647.00	106.5	P
Antimony	1000.0	991.19	99.1	1000.0	1010.30	101.0	981.63	98.2	P
Arsenic	1000.0	1024.80	102.5	1000.0	1017.00	101.7	1005.20	100.5	P
Barium	1000.0	1076.80	107.7	1000.0	1043.40	104.3	1059.90	106.0	P
Beryllium	1000.0	1034.60	103.5	1000.0	1040.70	104.1	1096.60	109.7	P
Cadmium	1000.0	1069.60	107.0	1000.0	1063.40	106.3	1065.40	106.5	P
Calcium	50000.0	51118.00	102.2	50000.0	50460.00	100.9	55771.00	111.5	P
Chromium	1000.0	987.51	98.8	1000.0	992.99	99.3	1004.40	100.4	P
Cobalt	1000.0	1002.40	100.2	1000.0	998.72	99.9	971.44	97.1	P
Copper	1000.0	1050.00	105.0	1000.0	1039.40	103.9	1059.30	105.9	P
Iron	10000.0	10555.00	105.6	10000.0	10485.00	104.8	10962.00	109.6	P
Lead	1000.0	1009.50	101.0	1000.0	1007.40	100.7	957.76	95.8	P
Magnesium	50000.0	50378.00	100.8	50000.0	49658.00	99.3	52393.00	104.8	P
Manganese	1000.0	1056.10	105.6	1000.0	1077.30	107.7	1175.90	117.6	P
Mercury	4.0	3.96	99.0	4.0	3.81	95.2	3.90	97.5	AV
Nickel	1000.0	1004.10	100.4	1000.0	1004.50	100.4	1001.40	100.1	P
Potassium	10000.0	9856.90	98.6	10000.0	9943.20	99.4	10586.00	105.9	P
Selenium	1000.0	1036.60	103.7	1000.0	1027.40	102.7	1037.70	103.8	P
Silver	500.0	483.11	96.6	500.0	482.18	96.4	514.32	102.9	P
Sodium	50000.0	53500.00	107.0	50000.0	52978.00	106.0	56856.00	113.7	P
Thallium	1000.0	958.72	95.9	1000.0	1007.70	100.8	996.01	99.6	P
Vanadium	1000.0	990.13	99.0	1000.0	1006.50	100.6	1082.20	108.2	P
Zinc	1000.0	1006.90	100.7	1000.0	1021.80	102.2	1045.70	104.6	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum				10000.0	10245.00	102.4	10844.00	108.4	P
Antimony				1000.0	1048.70	104.9	1034.80	103.5	P
Arsenic				1000.0	1031.10	103.1	1011.00	101.1	P
Barium				1000.0	1025.50	102.6	1008.50	100.8	P
Beryllium				1000.0	1020.60	102.1	1027.00	102.7	P
Cadmium				1000.0	1055.60	105.6	1054.30	105.4	P
Calcium				50000.0	47622.00	95.2	48896.00	97.8	P
Chromium				1000.0	979.16	97.9	992.40	99.2	P
Cobalt				1000.0	1024.60	102.5	1035.10	103.5	P
Copper				1000.0	1054.40	105.4	1080.30	108.0	P
Iron				10000.0	10073.00	100.7	9894.70	98.9	P
Lead				1000.0	1051.80	105.2	1072.90	107.3	P
Magnesium				50000.0	48923.00	97.8	50191.00	100.4	P
Manganese				1000.0	998.12	99.8	1003.20	100.3	P
Mercury				2.0	1.84	92.0			AV
Nickel				1000.0	1006.10	100.6	998.90	99.9	P
Potassium				10000.0	9597.50	96.0	9149.10	91.5	P
Selenium				1000.0	1022.80	102.3	996.14	99.6	P
Silver				500.0	450.98	90.2	442.29	88.5	P
Sodium				50000.0	53628.00	107.3	54592.00	109.2	P
Thallium				1000.0	1018.10	101.8	1012.40	101.2	P
Vanadium				1000.0	945.32	94.5	935.81	93.6	P
Zinc				1000.0	989.71	99.0	988.24	98.8	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Zinc	1000.0	983.01	98.3	1000.0	968.94	96.9	954.31	95.4	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Initial Calibration Source: Accustandard,HighPurity

Continuing Calibration Source: Spex

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Zinc				1000.0	956.79	95.7			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	50.0	U	50.0	U	50.0	U	50.0	U	50.000	U	P
Antimony	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Barium	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Calcium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Chromium	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	P
Cobalt	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Copper	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Iron	30.0	U	30.0	U	30.0	U	30.0	U	36.393	J	P
Lead	1.5	U	1.5	U	1.5	U	1.5	U	1.500	U	P
Magnesium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Manganese	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Mercury	0.080	U	0.080	U	0.080	U	0.080	U	0.080	U	AV
Nickel	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Selenium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Silver	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Sodium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.000	U	P
Thallium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Vanadium	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum									50.000	U	P
Antimony									5.000	U	P
Arsenic									3.000	U	P
Barium									5.000	U	P
Beryllium									1.000	U	P
Cadmium									1.000	U	P
Calcium									1000.000	U	P
Chromium									2.000	U	P
Cobalt									5.000	U	P
Copper									5.000	U	P
Iron									30.000	U	P
Lead									1.500	U	P
Magnesium									1000.000	U	P
Manganese									3.000	U	P
Mercury			0.080	U							AV
Nickel									3.000	U	P
Potassium									1000.000	U	P
Selenium									3.000	U	P
Silver									1.000	U	P
Sodium									1000.000	U	P
Thallium									3.000	U	P
Vanadium									5.000	U	P
Zinc									46.544		P

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum	50.0	U	81.3	J	50.0	U	50.0	U			P
Antimony	5.0	U	5.0	U	5.0	U	5.0	U			P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U			P
Barium	5.0	U	5.0	U	5.0	U	5.0	U			P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U			P
Cadmium	1.0	U	1.0	U	1.0	U	1.2	J			P
Calcium	1000.0	U	1000.0	U	1000.0	U	1000.0	U			P
Chromium	2.0	U	2.0	U	2.0	U	2.0	U			P
Cobalt	5.0	U	5.0	U	5.0	U	5.0	U			P
Copper	5.0	U	5.0	U	5.0	U	5.0	U			P
Iron	30.0	U	33.4	J	30.0	U	67.4	J			P
Lead	1.5	U	1.5	U	1.5	U	1.5	U			P
Magnesium	1000.0	U	1000.0	U	1000.0	U	1000.0	U			P
Manganese	3.0	U	3.0	U	3.0	U	3.0	U			P
Mercury	0.080	U	0.080	U	0.080	U	0.080	U	0.080	U	AV
Nickel	3.0	U	3.0	U	3.0	U	3.0	U			P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U			P
Selenium	3.0	U	3.0	U	3.0	U	3.0	U			P
Silver	1.0	U	1.0	U	1.0	U	1.0	U			P
Sodium	1000.0	U	1000.0	U	1000.0	U	1000.0	U			P
Thallium	3.0	U	3.0	U	3.0	U	3.0	U			P
Vanadium	5.0	U	5.0	U	5.0	U	5.0	U			P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U			P

USEPA - CLP

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BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum			50.0	U							P
Antimony			5.0	U							P
Arsenic			3.0	U							P
Barium			5.0	U							P
Beryllium			1.0	U							P
Cadmium			1.0	U							P
Calcium			1000.0	U							P
Chromium			2.0	U							P
Cobalt			5.0	U							P
Copper			5.0	U							P
Iron			30.0	U							P
Lead			1.5	U							P
Magnesium			1000.0	U							P
Manganese			3.0	U							P
Nickel			3.0	U							P
Potassium			1000.0	U							P
Selenium			3.0	U							P
Silver			1.0	U							P
Sodium			1000.0	U							P
Thallium			3.0	U							P
Vanadium			5.0	U							P
Zinc			5.0	U							P

3

BLANKS

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

ICP ID Number: Thermo ICP 6500 ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	500000	500000	520050	531270.0	106.3			
Antimony	0	600	-3	690.4	115.1			
Arsenic	0	100	-3	117.9	117.9			
Barium	0	500	0	580.3	116.1			
Beryllium	0	500	0	522.4	104.5			
Cadmium	0	1000	0	1194.4	119.4			
Calcium	500000	500000	521900	542520.0	108.5			
Chromium	0	500	-2	481.7	96.3			
Cobalt	0	500	0	516.4	103.3			
Copper	0	500	0	566.8	113.4			
Iron	200000	200000	211110	216520.0	108.3			
Lead	0	50	2	52.9	105.8			
Magnesium	500000	500000	516350	534210.0	106.8			
Manganese	0	500	2	509.9	102.0			
Nickel	0	1000	-1	1031.6	103.2			
Potassium	0	0	-39	-28.1				
Selenium	0	50	-4	59.2	118.4			
Silver	0	200	0	215.1	107.6			
Sodium	0	0	56	27.9				
Thallium	0	100	0	94.9	94.9			
Vanadium	0	500	1	490.1	98.0			
Zinc	0	1000	-4	994.8	99.5			

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

ICP ID Number: Thermo ICP 6500 ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	500000	500000	584340	520220.0	104.0			
Antimony	0	600	0	656.2	109.4			
Arsenic	0	100	-3	109.3	109.3			
Barium	0	500	2	551.6	110.3			
Beryllium	0	500	0	459.8	92.0			
Cadmium	0	1000	2	1189.2	118.9			
Calcium	500000	500000	526140	467370.0	93.5			
Chromium	0	500	-3	416.7	83.3			
Cobalt	0	500	4	474.7	94.9			
Copper	0	500	1	507.1	101.4			
Iron	200000	200000	213850	188290.0	94.1			
Lead	0	50	0	48.7	97.4			
Magnesium	500000	500000	549230	480570.0	96.1			
Manganese	0	500	0	443.9	88.8			
Nickel	0	1000	-4	904.9	90.5			
Potassium	0	0	-25	7.5				
Selenium	0	50	5	59.1	118.2			
Silver	0	200	0	195.5	97.8			
Sodium	0	0	111	74.4				
Thallium	0	100	-2	81.0	81.0			
Vanadium	0	500	2	427.8	85.6			
Zinc	0	1000	-2	956.4	95.6			

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

ICP ID Number: Thermo ICP 6500 ICS Source: Spex, CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Zinc	0	1000	-4	902.0	90.2			

USEPA - CLP

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Arcadis **SDG No.:** 0907062

Contract: Arcadis **Lab Code:** **Case No.:** **SAS No.:**

Aqueous LCS Source: HighPurity **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSW9G15011								
	Aluminum	ug/L	2000.0	2024.30		101.2	80.0 - 120.0	P
	Antimony	ug/L	250.0	238.84		95.5	80.0 - 120.0	P
	Arsenic	ug/L	250.0	240.75		96.3	80.0 - 120.0	P
	Barium	ug/L	2000.0	2024.60		101.2	80.0 - 120.0	P
	Beryllium	ug/L	50.0	54.86		109.7	80.0 - 120.0	P
	Cadmium	ug/L	125.0	122.35		97.9	80.0 - 120.0	P
	Calcium	ug/L	5000.0	5725.60		114.5	80.0 - 120.0	P
	Chromium	ug/L	200.0	206.97		103.5	80.0 - 120.0	P
	Cobalt	ug/L	500.0	482.19		96.4	80.0 - 120.0	P
	Copper	ug/L	250.0	274.18		109.7	80.0 - 120.0	P
	Iron	ug/L	1000.0	1181.00		118.1	80.0 - 120.0	P
	Lead	ug/L	250.0	247.76		99.1	80.0 - 120.0	P
	Magnesium	ug/L	5000.0	5034.40		100.7	80.0 - 120.0	P
	Manganese	ug/L	500.0	558.94		111.8	80.0 - 120.0	P
	Nickel	ug/L	500.0	496.73		99.3	80.0 - 120.0	P
	Potassium	ug/L	5000.0	4906.30	J	98.1	80.0 - 120.0	P
	Selenium	ug/L	250.0	233.78		93.5	80.0 - 120.0	P
	Silver	ug/L	250.0	245.52		98.2	80.0 - 120.0	P
	Sodium	ug/L	5000.0	5526.30		110.5	80.0 - 120.0	P
	Thallium	ug/L	250.0	249.70		99.9	80.0 - 120.0	P
	Vanadium	ug/L	500.0	510.79		102.2	80.0 - 120.0	P
	Zinc	ug/L	500.0	464.88		93.0	80.0 - 120.0	P

USEPA - CLP

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Arcadis **SDG No.:** 0907062

Contract: Arcadis **Lab Code:** **Case No.:** **SAS No.:**

Aqueous LCS Source: HighPurity **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSW9G15020								
	Aluminum	ug/L	2000.0	1964.00		98.2	80.0 - 120.0	P
	Antimony	ug/L	250.0	236.70		94.7	80.0 - 120.0	P
	Arsenic	ug/L	250.0	240.65		96.3	80.0 - 120.0	P
	Barium	ug/L	2000.0	1985.90		99.3	80.0 - 120.0	P
	Beryllium	ug/L	50.0	53.42		106.8	80.0 - 120.0	P
	Cadmium	ug/L	125.0	119.13		95.3	80.0 - 120.0	P
	Calcium	ug/L	5000.0	5525.30		110.5	80.0 - 120.0	P
	Chromium	ug/L	200.0	206.05		103.0	80.0 - 120.0	P
	Cobalt	ug/L	500.0	475.73		95.1	80.0 - 120.0	P
	Copper	ug/L	250.0	266.41		106.6	80.0 - 120.0	P
	Iron	ug/L	1000.0	1149.40		114.9	80.0 - 120.0	P
	Lead	ug/L	250.0	244.98		98.0	80.0 - 120.0	P
	Magnesium	ug/L	5000.0	4838.90	J	96.8	80.0 - 120.0	P
	Manganese	ug/L	500.0	540.35		108.1	80.0 - 120.0	P
	Nickel	ug/L	500.0	493.90		98.8	80.0 - 120.0	P
	Potassium	ug/L	5000.0	4794.10	J	95.9	80.0 - 120.0	P
	Selenium	ug/L	250.0	231.05		92.4	80.0 - 120.0	P
	Silver	ug/L	250.0	240.50		96.2	80.0 - 120.0	P
	Sodium	ug/L	5000.0	5337.60		106.8	80.0 - 120.0	P
	Thallium	ug/L	250.0	246.92		98.8	80.0 - 120.0	P
	Vanadium	ug/L	500.0	498.27		99.7	80.0 - 120.0	P
	Zinc	ug/L	500.0	453.21		90.6	80.0 - 120.0	P

USEPA - CLP

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Arcadis **SDG No.:** 0907062

Contract: Arcadis **Lab Code:** **Case No.:** **SAS No.:**

Aqueous LCS Source: HighPurity **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSW9G15020A								
	Zinc	ug/L	500.0	433.08		86.6	80.0 - 120.0	P

USEPA - CLP

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Arcadis **SDG No.:** 0907062

Contract: Arcadis **Lab Code:** **Case No.:** **SAS No.:**

Aqueous LCS Source: Spex **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSW9G14006								
	Mercury	ug/L	2.00	2.17		108.5	80.0 - 120.0	AV

USEPA - CLP

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Arcadis **SDG No.:** 0907062

Contract: Arcadis **Lab Code:** **Case No.:** **SAS No.:**

Aqueous LCS Source: Spex **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
LCSW9G15028								
	Mercury	ug/L	2.00	2.04		102.0	80.0 - 120.0	AV

USEPA - CLP

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METHOD DETECTION LIMITS

Client: Arcadis **SDG No.:** 0907062

Contract: Arcadis **Lab Code:** **Case No.:** **SAS No.:**

Analyte	Wave- length (nm)	MDL ug/L	RDL ug/L
PE CVAA			**Date:** 05/18/09
Mercury	253.70	0.08	0.20
Thermo ICP 6500			**Date:** 02/09/09
Aluminum	396.1	50.0	200.0
Antimony	206.8	5.0	15.0
Arsenic	189.0	3.0	10.0
Barium	233.5	5.0	40.0
Beryllium	313.0	1.0	5.0
Cadmium	228.8	1.0	5.0
Calcium	317.9	1000.0	5000.0
Chromium	267.7	2.0	10.0
Cobalt	228.6	5.0	15.0
Copper	324.7	5.0	10.0
Iron	261.1	30.0	100.0
Lead	220.3	1.5	3.0
Magnesium	279.0	1000.0	5000.0
Manganese	257.6	3.0	15.0
Nickel	231.6	3.0	10.0
Potassium	766.4	1000.0	5000.0
Selenium	196.0	3.0	5.0
Silver	328.0	1.0	10.0
Sodium	589.5	1000.0	5000.0
Thallium	190.8	3.0	10.0
Vanadium	292.4	5.0	15.0
Zinc	206.2	5.0	20.0

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PREPARATION LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Method: P

EPA Sample No.	Preparation Date	Initial Volume mL	Volume (mL)
PBW9G15011	07/15/09	50.0	50.0
LCSW9G15011	07/15/09	50.0	50.0
1549HP010(20-30)(070809)	07/15/09	50.0	50.0
1549HP009(19-29)(070809)	07/15/09	50.0	50.0
1041HP020(25-30)(070809)	07/15/09	50.0	50.0
1041HP021(21-26)(070809)	07/15/09	50.0	50.0
1041HPDUP002(21-26)(070809)	07/15/09	50.0	50.0

SMO 7/23/09

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PREPARATION LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Method: P

EPA Sample No.	Preparation Date	Initial Volume mL	Volume (mL)
PBW9G15020	07/15/09	50.0	50.0
LCSW9G15020	07/15/09	50.0	50.0
1549HP010(20-30) (070809) Soluble	07/15/09	50.0	50.0
1549HP009(19-29) (070809) Soluble	07/15/09	50.0	50.0
1041HP020(25-30) (070809) Soluble	07/15/09	50.0	50.0
1041HP021(21-26) (070809) Soluble	07/15/09	50.0	50.0
1041HPDUP002(21-26) (070809) Soluble	07/15/09	50.0	50.0

SMP 7/23/09

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PREPARATION LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Method: P

EPA Sample No.	Preparation Date	Initial Volume mL	Volume (mL)
PBW9G15020A	07/21/09	50.0	50.0
LCSW9G15020A	07/21/09	50.0	50.0
1549HP010(20-30)(070	809) Soluble 07/21/09	50.0	50.0
1041HP020(25-30)(070	809) Soluble 07/21/09	50.0	50.0

SNO 7/23/09

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PREPARATION LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Method: CV

EPA Sample No.	Preparation Date	Initial Volume mL	Volume (mL)
LCSW9G14006	07/14/09	30.0	30.0
PBW9G14006	07/14/09	30.0	30.0
1549HP010(20-30)(070809)	07/14/09	30.0	30.0
1549HP009(19-29)(070809)	07/14/09	30.0	30.0
1041HP020(25-30)(070809)	07/14/09	30.0	30.0
1041HP021(21-26)(070809)	07/14/09	30.0	30.0
1041HPDUP002(21-26)(070809)	07/14/09	30.0	30.0

SMO 7/23/09

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PREPARATION LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Method: CV

EPA Sample No.	Preparation Date	Initial Volume mL	Volume (mL)
LCSW9G15028	07/16/09	30.0	30.0
PBW9G15028	07/16/09	30.0	30.0
1549HP010(20-30) (07080) Soluble	07/16/09	30.0	30.0
1549HP009(19-29) (07080) Soluble	07/16/09	30.0	30.0
1041HP020(25-30) (07080) Soluble	07/16/09	30.0	30.0
1041HP021(21-26) (07080) Soluble	07/16/09	30.0	30.0
1041HPDUP002(21-26) (07080) Soluble	07/16/09	30.0	30.0

SJR 7/23/09

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: Thermo ICP 6500 Method: P

Start Date: 07/16/09 End Date: 07/16/09

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
S0	1.00	1421		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
S	1.00	1428		X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X		X	X	X			
ZZZZZZ	1.00	1438																												
S	1.00	1447		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
S	1.00	1457					X																							
S	1.00	1506		X										X		X						X								
ZZZZZZ	1.00	1516																												
ZZZZZZ	1.00	1522																												
S	1.00	1527			X	X		X	X		X	X	X		X		X		X		X			X	X	X			
S	1.00	1535																		X			X							
S	1.00	1543								X						X							X							
ZZZZZZ	1.00	1557																												
ZZZZZZ	1.00	1602																												
ZZZZZZ	1.00	1609																												
ICV1	1.00	1838		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
ICB1	1.00	1846		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
ZZZZZZ	1.00	1850																												
ZZZZZZ	1.00	1855																												
ZZZZZZ	1.00	1901																												
ZZZZZZ	1.00	1908																												
ZZZZZZ	1.00	1913																												
ZZZZZZ	1.00	1918																												
ZZZZZZ	1.00	1925																												
ZZZZZZ	1.00	1929																												
ZZZZZZ	1.00	1934																												
ZZZZZZ	1.00	1939																												
ZZZZZZ	1.00	1943																												
ZZZZZZ	1.00	1951																												
CRDL1	1.00	2014		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
IFA-1	1.00	2018		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
IFB-1	1.00	2023		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
CCV1	1.00	2031		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
CCB1	1.00	2038		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
PBW9G15011	1.00	2043		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
LCSW9G15011	1.00	2047		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
ZZZZZZ	1.00	2054																												
ZZZZZZ	1.00	2058																												
ZZZZZZ	1.00	2103																												

USEPA - CLP

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: Thermo ICP 6500 Method: P

Start Date: 07/16/09 End Date: 07/16/09

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN	
ZZZZZZ	1.00	2107																										
ZZZZZZ	1.00	2112																										
ZZZZZZ	1.00	2117																										
ZZZZZZ	1.00	2123																										
ZZZZZZ	1.00	2128																										
ZZZZZZ	1.00	2132																										
ZZZZZZ	1.00	2137																										
ZZZZZZ	1.00	2141																										
ZZZZZZ	1.00	2146																										
PBW9G15020	1.00	2150		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
LCSW9G15020	1.00	2155		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
CCV2	1.00	2200		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
CCB2	1.00	2207		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
ZZZZZZ	1.00	2212																										
ZZZZZZ	1.00	2216																										
ZZZZZZ	1.00	2221																										
1549HP010(20-30)(07080)Solute	1.00	2226		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		
1549HP009(19-29)(07080)Sol.	1.00	2230		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
1041HP020(25-30)(07080)Sol.	1.00	2235		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		
1041HP021(21-26)(07080)Sol.	1.00	2239		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
1041HPDUP002(21-26)(07080)Sol.	1.00	2244		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
ZZZZZZ	1.00	2248																										
ZZZZZZ	1.00	2253																										
CCV3	1.00	2258		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	
CCB3	1.00	2306		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: Thermo ICP 6500 Method: P

Start Date: 07/20/09 End Date: 07/20/09

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
S0	1.00	1532		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
S	1.00	1537		X	X	X	X	X	X	X	X	X	X	X	X		X		X	X	X	X		X	X	X				
S	1.00	1542		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
S	1.00	1547					X																							
S	1.00	1552		X										X		X						X								
S	1.00	1557			X	X		X	X		X	X	X		X		X		X		X			X	X	X				
S	1.00	1602																		X			X							
S	1.00	1607								X						X							X							
ZZZZZZ	1.00	1613																												
ZZZZZZ	1.00	1617																												
ZZZZZZ	1.00	1624																												
ICV2	1.00	1630		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
ICB2	1.00	1637		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
ZZZZZZ	1.00	1642																												
ZZZZZZ	1.00	1647																												
ZZZZZZ	1.00	1651																												
ZZZZZZ	1.00	1657																												
ZZZZZZ	1.00	1702																												
ZZZZZZ	1.00	1707																												
ZZZZZZ	1.00	1711																												
ZZZZZZ	1.00	1716																												
CRDL1	1.00	1724		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
ZZZZZZ	1.00	1728																												
ZZZZZZ	1.00	1733																												
ZZZZZZ	1.00	1742																												
ZZZZZZ	1.00	1747																												
ICSA	1.00	1754		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
ICSAB	1.00	1759		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
CCV1	1.00	1806		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
CCB1	1.00	1813		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				
ZZZZZZ	1.00	1818																												
ZZZZZZ	1.00	1823																												
ZZZZZZ	1.00	1830																												
ZZZZZZ	1.00	1835																												
ZZZZZZ	1.00	1840																												
ZZZZZZ	1.00	1844																												
ZZZZZZ	1.00	1849																												
CCV2	1.00	1855		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X				

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: Thermo ICP 6500 Method: P

Start Date: 07/20/09 End Date: 07/20/09

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
CCB2	1.00	1902		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
1549HP010(20-30)(070809)	2.00	1907						X		X											X			X						
1549HP009(19-29)(070809)	2.00	1912						X		X											X			X						
1041HP020(25-30)(070809)	2.00	1918						X		X											X			X						
1041HP021(21-26)(070809)	2.00	1924						X		X											X			X						
1041HPDUP002(21-26)(070809)	2.00	1930						X		X											X			X						
1549HP010(20-30)(070809)	10.00	1935		X	X	X	X		X		X	X	X	X	X	X	X	X		X		X	X		X	X	X			
ZZZZZZ	10.00	1941																												
1041HP020(25-30)(070809)	10.00	1947		X	X	X	X		X		X	X	X	X	X	X	X	X		X		X	X		X	X	X			
1041HP021(21-26)(070809)	10.00	1952		X	X	X	X		X		X	X	X	X	X	X	X	X		X		X	X		X	X	X			
1041HPDUP002(21-26)(070809)	10.00	1958		X	X	X	X		X		X	X	X	X	X	X	X	X		X		X	X		X	X	X			
CCV3	1.00	2003		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
CCB3	1.00	2011		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
ZZZZZZ	10.00	2015																												
ZZZZZZ	50.00	2020																												
1549HP009(19-29)(070809)	50.00	2025		X	X	X	X		X		X	X	X	X	X	X	X	X		X		X	X		X	X	X			
ZZZZZZ	50.00	2029																												
ZZZZZZ	50.00	2033																												
ZZZZZZ	50.00	2038																												
CCV4	1.00	2042		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			
CCB4	1.00	2050		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X			

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: Thermo ICP 6500 Method: P

Start Date: 07/22/09 End Date: 07/22/09

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	1203																							X	
S	1.00	1208																							X	
S	1.00	1214																							X	
ZZZZZZ	1.00	1219																								
ZZZZZZ	1.00	1225																								
S	1.00	1230																							X	
ZZZZZZ	1.00	1236																								
ZZZZZZ	1.00	1244																								
ZZZZZZ	1.00	1252																								
ZZZZZZ	1.00	1258																								
ZZZZZZ	1.00	1303																								
ICV3	1.00	1312																							X	
ICB3	1.00	1319																							X	
ZZZZZZ	1.00	1324																								
ZZZZZZ	1.00	1328																								
ZZZZZZ	1.00	1335																								
ZZZZZZ	1.00	1340																								
ZZZZZZ	1.00	1345																								
ZZZZZZ	1.00	1351																								
ZZZZZZ	1.00	1355																								
ZZZZZZ	1.00	1400																								
ZZZZZZ	1.00	1405																								
ZZZZZZ	1.00	1410																								
CRDL1	1.00	1417																							X	
ICSA	1.00	1422																							X	
ZZZZZZ	1.00	1427																								
ICSAB	1.00	1433																							X	
CCV1	1.00	1442																							X	
CCB1	1.00	1449																							X	
ZZZZZZ	1.00	1454																								
ZZZZZZ	1.00	1458																								
ZZZZZZ	1.00	1503																								
ZZZZZZ	1.00	1507																								
ZZZZZZ	1.00	1512																								
ZZZZZZ	1.00	1517																								
ZZZZZZ	1.00	1521																								
ZZZZZZ	1.00	1526																								
ZZZZZZ	1.00	1531																								

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: Thermo ICP 6500 Method: P

Start Date: 07/22/09 End Date: 07/22/09

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	1535																										
ZZZZZZ	1.00	1541																										
ZZZZZZ	1.00	1551																										
ZZZZZZ	1.00	1556																										
ZZZZZZ	1.00	1601																										
ZZZZZZ	1.00	1605																										
ZZZZZZ	1.00	1610																										
ZZZZZZ	1.00	1616																										
ZZZZZZ	1.00	1621																										
ZZZZZZ	1.00	1627																										
ZZZZZZ	1.00	1631																										
CCV2	1.00	1638																								X		
CCB2	1.00	1645																								X		
PBW9G15020A	1.00	1650																								X		
LCSW9G15020A	1.00	1654																								X		
1549HP010(20-30) (07080 Sol	1.00	1701																								X		
1041HP020(25-30) (07080 Sol	1.00	1705																								X		
ZZZZZZ	1.00	1710																										
ZZZZZZ	1.00	1714																										
ZZZZZZ	1.00	1719																										
ZZZZZZ	1.00	1723																										
ZZZZZZ	1.00	1728																										
ZZZZZZ	1.00	1732																										
ZZZZZZ	1.00	1737																										
CCV3	1.00	1743																								X		
CCB3	1.00	1750																								X		

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: PE CVAA Method: AV

Start Date: 07/16/09 End Date: 07/16/09

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	0923																X									
S0.20	1.00	0924																X									
S0.50	1.00	0925																X									
S1.0	1.00	0926																X									
S2.0	1.00	0927																X									
S4.0	1.00	0928																X									
S6.0	1.00	0930																X									
S10.0	1.00	0931																X									
ICV1	1.00	0938																X									
ICB1	1.00	0939																X									
CRDL1	1.00	0941																X									
ZZZZZZ	1.00	0942																									
ZZZZZZ	1.00	0943																									
ZZZZZZ	1.00	0944																									
ZZZZZZ	1.00	0946																									
ZZZZZZ	1.00	0947																									
ZZZZZZ	1.00	0948																									
ZZZZZZ	1.00	0950																									
ZZZZZZ	1.00	0951																									
ZZZZZZ	1.00	0952																									
CCV1	1.00	1000																X									
CCB1	1.00	1001																X									
ZZZZZZ	1.00	1003																									
ZZZZZZ	1.00	1004																									
ZZZZZZ	1.00	1005																									
ZZZZZZ	1.00	1006																									
ZZZZZZ	1.00	1008																									
ZZZZZZ	1.00	1009																									
ZZZZZZ	1.00	1010																									
ZZZZZZ	1.00	1012																									
ZZZZZZ	1.00	1013																									
ZZZZZZ	1.00	1014																									
CCV2	1.00	1019																X									
CCB2	1.00	1021																X									
ZZZZZZ	1.00	1022																									
ZZZZZZ	1.00	1023																									
ZZZZZZ	1.00	1024																									
ZZZZZZ	1.00	1026																									

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: PE CVAA Method: AV

Start Date: 07/16/09 End Date: 07/16/09

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	1027																										
LCSW9G14006	1.00	1031																X										
PBW9G14006	1.00	1033																X										
ZZZZZZ	1.00	1034																										
1549HP010(20-30)(07080)	1.00	1035																X										
1549HP009(19-29)(07080)	1.00	1037																X										
CCV3	1.00	1040																X										
CCB3	1.00	1041																X										
1041HP020(25-30)(07080)	1.00	1043																X										
1041HP021(21-26)(07080)	1.00	1044																X										
1041HPDUP002(21-26)(07080)	1.00	1045																X										
ZZZZZZ	1.00	1046																										
ZZZZZZ	1.00	1048																										
ZZZZZZ	1.00	1049																										
ZZZZZZ	1.00	1050																										
ZZZZZZ	1.00	1051																										
ZZZZZZ	1.00	1053																										
ZZZZZZ	1.00	1054																										
CCV4	1.00	1055																X										
CCB4	1.00	1056																X										

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: PE CVAA Method: AV

Start Date: 07/16/09 End Date: 07/16/09

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN			
S0	1.00	1429																X												
S0.20	1.00	1430																X												
S0.50	1.00	1431																X												
S1.0	1.00	1432																X												
S2.0	1.00	1433																X												
S4.0	1.00	1435																X												
S6.0	1.00	1436																X												
S10.0	1.00	1437																X												
ICV2	1.00	1456																X												
ICB2	1.00	1457																X												
CRDL1	1.00	1507																X												
ZZZZZZ	1.00	1508																												
ZZZZZZ	1.00	1510																												
ZZZZZZ	1.00	1511																												
ZZZZZZ	1.00	1512																												
ZZZZZZ	1.00	1514																												
ZZZZZZ	1.00	1515																												
ZZZZZZ	1.00	1516																												
ZZZZZZ	1.00	1517																												
ZZZZZZ	1.00	1519																												
CCV1	1.00	1520																X												
CCB1	1.00	1521																X												
ZZZZZZ	1.00	1522																												
ZZZZZZ	1.00	1524																												
ZZZZZZ	1.00	1525																												
ZZZZZZ	1.00	1526																												
ZZZZZZ	1.00	1528																												
ZZZZZZ	1.00	1529																												
ZZZZZZ	1.00	1530																												
ZZZZZZ	1.00	1531																												
ZZZZZZ	1.00	1533																												
ZZZZZZ	1.00	1534																												
CCV2	1.00	1535																X												
CCB2	1.00	1536																X												
ZZZZZZ	1.00	1538																												
ZZZZZZ	1.00	1539																												
ZZZZZZ	1.00	1540																												
LCSW9G15028	1.00	1544																X												

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ANALYSIS RUN LOG

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0907062

Instrument ID Number: PE CVAA Method: AV

Start Date: 07/16/09 End Date: 07/16/09

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
PBW9G15028	1.00	1545																X								
1549HP010(20-30)(07080[illegible]Sol	1.00	1547																X								
1549HP009(19-29)(07080[illegible]Sol	1.00	1548																X								
1041HP020(25-30)(07080[illegible]Sol	1.00	1549																X								
1041HP021(21-26)(07080[illegible]Sol	1.00	1551																X								
1041HPDUP002(21-26)(07[illegible]Sol	1.00	1552																X								
CCV3	1.00	1553																X								
CCB3	1.00	1554																X								

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Appendix E

Risk Assessment Calculation Tables

Tables

E-1	Risk and Hazard Calculations for Site Worker Exposure to Soil, Building 1034
E-2	Data Entry Sheet, Industrial Exposure to Soil Gas, Building 1034
E-3	Chemical Properties Sheet, Exposure to Soil Gas
E-4	Intermediate Calculations Sheet, Industrial Exposure to Soil Gas, Building 1034
E-5	Results Sheet, Industrial Exposure to Soil Gas, Building 1034
E-6	Risk and Hazard Calculations for Hypothetical Future Construction Worker Exposure to Soil, Building 1034
E-7	Risk and Hazard Calculations for Hypothetical Future Adult Resident Exposure to Soil, Building 1034
E-8	Data Entry Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1034
E-9	Intermediate Calculations Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1034
E-10	Results Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1034
E-11	Risk and Hazard Calculations for Hypothetical Future Child Resident Exposure to Soil, Building 1034
E-12	Data Entry Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1034
E-13	Intermediate Calculations Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1034
E-14	Results Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1034
E-15	Risk and Hazard Calculations for Site Worker Exposure to Soil, Building 1041
E-16	Data Entry Sheet, Industrial Exposure to Soil Gas, Building 1041
E-17	Intermediate Calculations Sheet, Industrial Exposure to Soil Gas, Building 1041
E-18	Results Sheet, Industrial Exposure to Soil Gas, Building 1041
E-19	Risk and Hazard Calculations for Hypothetical Future Construction Worker Exposure to Soil, Building 1041

E-20	Risk and Hazard Calculations for Hypothetical Future Adult Resident Exposure to Soil, Building 1041
E-21	Data Entry Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1041
E-22	Intermediate Calculations Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1041
E-23	Results Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1041
E-24	Risk and Hazard Calculations for Hypothetical Future Child Resident Exposure to Soil, Building 1041
E-25	Data Entry Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1041
E-26	Intermediate Calculations Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1041
E-27	Results Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1549
E-28	Risk and Hazard Calculations for Site Worker Exposure to Soil, Building 1549
E-29	Data Entry Sheet, Industrial Exposure to Soil Gas, Building 1549
E-30	Intermediate Calculations Sheet, Industrial Exposure to Soil Gas, Building 1549
E-31	Results Sheet, Industrial Exposure to Soil Gas, Building 1549
E-32	Risk and Hazard Calculations for Hypothetical Future Construction Worker Exposure to Soil, Building 1549
E-33	Risk and Hazard Calculations for Hypothetical Future Adult Resident Exposure to Soil, Building 1549
E-34	Data Entry Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1549
E-35	Intermediate Calculations Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1549
E-36	Results Sheet, Hypothetical Future Adult Resident Exposure to Soil Gas, Building 1549
E-37	Risk and Hazard Calculations for Hypothetical Future Child Resident Exposure to Soil, Building 1549
E-38	Data Entry Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1549

E-39 Intermediate Calculations Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1549

E-40 Results Sheet, Hypothetical Future Child Resident Exposure to Soil Gas, Building 1549

Table E-1
Risk and Hazard Calculations for Current and Future Hypothetical Site Worker Exposure to Soil
BUILDING 1034
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Current / Future
Receptor Population: Site Worker
Receptor Age: Adult

				CANCER RISK					NON-CANCER HAZARD				
				Route-Specific Risk			Calculated	Percent	Route-Specific Hazard			Calculated	Percent
Constituent	EPCs (mg/kg)	PEF (m^3/kg)		Oral	Dermal	Inhalation	Risk	Total ELCR	Oral	Dermal	Inhalation	Hazard	Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	2.60E+00	1.36E+09	P	3.3E-07	2.8E-07	1.7E-14	6.2E-07	3%	NA	NA	NA	NA	–
Benzo(a)pyrene	4.00E+00	1.36E+09	P	5.1E-06	4.4E-06	6.4E-12	9.5E-06	51%	NA	NA	NA	NA	–
Benzo(b)fluoranthene	1.28E+00	1.36E+09	P	1.6E-07	1.4E-07	8.4E-15	3.0E-07	2%	NA	NA	NA	NA	–
Dibenzo(a,h)anthracene	2.20E+00	1.36E+09	P	2.8E-06	2.4E-06	1.4E-13	5.2E-06	28%	NA	NA	NA	NA	–
Indeno(1,2,3-cd)pyrene	2.80E+00	1.36E+09	P	3.6E-07	3.1E-07	1.8E-14	6.6E-07	4%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	4.03E+04	1.36E+09	P	NA	NA	NA	NA	–	2.0E-02	1.3E-03	1.4E-03	2.2E-02	15%
Arsenic	7.42E+00	1.36E+09	P	1.9E-06	3.9E-07	1.9E-12	2.3E-06	13%	1.2E-02	2.4E-03	8.3E-05	1.5E-02	10%
Cobalt	1.68E+01	1.36E+09	P	NA	NA	9.1E-12	9.1E-12	<1%	2.7E-02	1.8E-03	NA	2.9E-02	20%
Iron	6.25E+04	1.36E+09	P	NA	NA	NA	NA	–	4.4E-02	2.9E-03	NA	4.7E-02	32%
Manganese	8.44E+02	1.36E+09	P	NA	NA	NA	NA	–	2.9E-03	4.9E-03	2.8E-03	1.1E-02	7%
Vanadium	9.21E+01	1.36E+09	P	NA	NA	NA	NA	–	6.4E-03	1.6E-02	NA	2.3E-02	16%
				Total ELCR			2E-05	100%	Total HI			0.1	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 50 × 250 × 25 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 3,300 × 0.10 × ABSd × 250 × 25 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 8 × 250 × 25 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 50 × 250 × 25) / (1,000,000 × 70 × 9,125 × RfDo)
HQd = (EPCs × 3,300 × 0.10 × ABSd × 250 × 25) / (1,000,000 × 70 × 9,125 × RfDa)
HQi = (EPCs / PEF × 8 × 250 × 25) / (9,125 × 24 × RfC)

Table E-2
DATA ENTRY SHEET
Industrial Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g ($\mu g/m^3$)	OR	Soil gas conc., C_g (ppmv)	Chemical
95636	1.70E+01			1,2,4-Trimethylbenzene
108678	1.40E+01			1,3,5-Trimethylbenzene
106990	1.80E+01			1,3-Butadiene
71432	1.12E+01			Benzene
75274	5.80E+01			Bromodichloromethane
74839	5.70E+00			Methyl bromide
56235	9.40E+00			Carbon tetrachloride
67663	6.08E+03			Chloroform
124481	2.50E+00			Chlorodibromomethane
127184	4.80E+00			Tetrachloroethylene
79016	1.61E+01			Trichloroethylene
67630	5.90E+00			Isopropanol
622968	1.10E+01			4-Ethyltoluene
142825	1.43E+01			Heptane
591786	1.37E+01			2-Hexanone
64175	2.02E+01			Ethanol
109999	1.20E+01			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^oC)	Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4			SIC		

Stratum A SCS soil type	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm-s^2)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.83	

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	25	25	250

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	1.70E+01	8.44E+04

Table E-3
CHEMICAL PROPERTIES SHEET
Exposure to Soil Gas
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
95636	1,2,4-Trimethylbenzene	6.06E-02	7.92E-06	6.14E-03	25	9,369	442.30	649.17	120.20	0.0E+00	6.0E-03
108678	1,3,5-Trimethylbenzene	6.02E-02	8.67E-06	5.87E-03	25	9,321	437.89	637.25	120.20	0.0E+00	6.0E-03
106990	1,3-Butadiene	2.49E-01	1.08E-05	7.34E-02	25	5,370	268.60	425.00	54.09	3.0E-02	2.0E-03
67641	Acetone	1.24E-01	1.14E-05	3.87E-05	25	6,955	329.20	508.10	58.08	0.0E+00	3.5E-01
71432	Benzene	8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	78.11	7.8E-06	3.0E-02
75274	Bromodichloromethane	2.98E-02	1.06E-05	1.60E-03	25	7,800	363.15	585.85	163.83	1.8E-05	7.0E-02
74839	Methyl bromide	7.28E-02	1.21E-05	6.22E-03	25	5,714	276.71	467.00	94.94	0.0E+00	5.0E-03
56235	Carbon tetrachloride	7.80E-02	8.80E-06	3.03E-02	25	7,127	349.90	556.60	153.82	1.5E-05	0.0E+00
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	119.38	2.3E-05	0.0E+00
124481	Chlorodibromomethane	1.96E-02	1.05E-05	7.81E-04	25	5,900	416.14	678.20	208.28	2.4E-05	7.0E-02
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	165.83	5.9E-06	6.0E-01
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	131.39	1.1E-04	4.0E-02
67630	Isopropanol	1.08E-01	9.91E-06	7.89E-06	25	9,600	355.35	806.15	60.10	0.0E+00	0.0E+00
622968	4-Ethyltoluene	7.28E-02	6.59E-06	4.55E-03	25	8,700	443.15	938.15	120.20	0.0E+00	0.0E+00
142825	Heptane	6.49E-02	7.59E-06	1.70E+00	25	7,700	371.65	830.15	100.00	0.0E+00	0.0E+00
540841	2,2,4-Trimethylpentane	5.74E-02	7.06E-06	6.76E-01	25	7,400	372.35	832.15	114.00	0.0E+00	0.0E+00
591786	2-Hexanone	7.82E-02	7.18E-06	9.30E-05	25	8,688	400.75	587.10	100.16	0.0E+00	0.0E+00
64175	Ethanol	1.32E-01	8.00E-06	4.66E-06	25	9,216	351.44	514.00	46.07	0.0E+00	0.0E+00
109999	Tetrahydrofuran	8.94E-02	1.00E-05	2.42E-04	25	7,125	338.00	540.50	72.11	0.0E+00	0.0E+00

Table E-4
INTERMEDIATE CALCULATIONS SHEET
ndustrial Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
95636	1,2,4-Trimethylbenzene	11,642	2.89E-03	1.23E-01	1.77E-04	3.15E-03	3.15E-03	1.70E+01	0.10	1.26E+00	3.15E-03	4.00E+02	2.18E+04	1.42E-05	2.41E-04
108678	1,3,5-Trimethylbenzene	11,626	2.77E-03	1.17E-01	1.77E-04	3.13E-03	3.13E-03	1.40E+01	0.10	1.26E+00	3.13E-03	4.00E+02	2.32E+04	1.42E-05	1.98E-04
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	1.80E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	1.61E-05	2.90E-04
67641	Acetone	7,510	2.38E-05	1.01E-03	1.77E-04	6.73E-03	6.73E-03	4.20E+02	0.10	1.26E+00	6.73E-03	4.00E+02	1.07E+02	1.47E-05	6.17E-03
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	1.12E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	1.44E-05	1.61E-04
75274	Bromodichloromethane	8,626	9.14E-04	3.88E-02	1.77E-04	1.55E-03	1.55E-03	5.80E+01	0.10	1.26E+00	1.55E-03	4.00E+02	6.09E+08	1.35E-05	7.82E-04
74839	Methyl bromide	5,611	4.33E-03	1.84E-01	1.77E-04	3.78E-03	3.78E-03	5.70E+00	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	1.43E-05	8.14E-05
56235	Carbon tetrachloride	7,818	1.83E-02	7.76E-01	1.77E-04	4.05E-03	4.05E-03	9.40E+00	0.10	1.26E+00	4.05E-03	4.00E+02	2.35E+03	1.43E-05	1.35E-04
67663	Chloroform	7,513	2.25E-03	9.56E-02	1.77E-04	5.40E-03	5.40E-03	6.08E+03	0.10	1.26E+00	5.40E-03	4.00E+02	3.37E+02	1.45E-05	8.82E-02
124481	Chlorodibromomethane	6,755	5.05E-04	2.14E-02	1.77E-04	1.03E-03	1.03E-03	2.50E+00	0.10	1.26E+00	1.03E-03	4.00E+02	1.78E+13	1.29E-05	3.22E-05
127184	Tetrachloroethylene	9,513	9.92E-03	4.21E-01	1.77E-04	3.74E-03	3.74E-03	4.80E+00	0.10	1.26E+00	3.74E-03	4.00E+02	4.49E+03	1.43E-05	6.85E-05
79016	Trichloroethylene	8,507	5.93E-03	2.52E-01	1.77E-04	4.10E-03	4.10E-03	1.61E+01	0.10	1.26E+00	4.10E-03	4.00E+02	2.13E+03	1.43E-05	2.31E-04
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	5.90E+00	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	1.47E-05	8.69E-05
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	1.10E+01	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	1.43E-05	1.57E-04
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	1.43E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	1.42E-05	2.03E-04
540841	2,2,4-Trimethylpentane	7,787	4.09E-01	1.74E+01	1.77E-04	2.98E-03	2.98E-03	0.00E+00	0.10	1.26E+00	2.98E-03	4.00E+02	3.82E+04	1.41E-05	0.00E+00
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	1.37E+01	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	1.43E-05	1.96E-04
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	2.02E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	1.51E-05	3.04E-04
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	1.20E+01	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	1.44E-05	1.73E-04

Table E-5
RESULTS SHEET
Industrial Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	1,2,4-Trimethylbenzene	NA	7.9E-06
108678	1,3,5-Trimethylbenzene	NA	7.5E-06
106990	1,3-Butadiene	7.1E-10	3.3E-05
67641	Acetone	NA	4.5E-08
71432	Benzene	1.0E-10	1.2E-06
75274	Bromodichloromethane	NA	NA
74839	Methyl bromide	NA	3.7E-06
56235	Carbon tetrachloride	1.6E-10	1.6E-07
67663	Chloroform	1.7E-07	2.1E-04
124481	Chlorodibromomethane	7.1E-11	NA
127184	Tetrachloroethylene	3.3E-11	5.8E-08
79016	Trichloroethylene	3.8E-11	NA
67630	Isopropanol	NA	2.8E-09
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**2E-07**	**0.0003**

Table E-6
Risk and Hazard Calculations for Hypothetical Future Construction Worker Exposure to Soil
BUILDING 1034
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

				CANCER RISK					NON-CANCER HAZARD				
				Route-Specific Risk			Calculated	Percent	Route-Specific Hazard			Calculated	Percent
Constituent	EPCs (mg/kg)	PEF (m^3/kg)		Oral	Dermal	Inhalation	Risk	Total ELCR	Oral	Dermal	Inhalation	Hazard	Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	2.60E+00	1.36E+09	P	4.6E-08	1.8E-08	3.6E-16	6.3E-08	3%	NA	NA	NA	NA	–
Benzo(a)pyrene	4.00E+00	1.36E+09	P	7.0E-07	2.7E-07	1.3E-13	9.7E-07	50%	NA	NA	NA	NA	–
Benzo(b)fluoranthene	1.28E+00	1.36E+09	P	2.2E-08	8.7E-09	1.8E-16	3.1E-08	2%	NA	NA	NA	NA	–
Dibenzo(a,h)anthracene	2.20E+00	1.36E+09	P	3.9E-07	1.5E-07	3.0E-15	5.4E-07	27%	NA	NA	NA	NA	–
Indeno(1,2,3-cd)pyrene	2.80E+00	1.36E+09	P	4.9E-08	1.9E-08	3.8E-16	6.8E-08	3%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	4.03E+04	1.36E+09	P	NA	NA	NA	NA	–	1.4E-01	4.1E-03	1.4E-03	1.4E-01	16%
Arsenic	7.42E+00	1.36E+09	P	2.7E-07	2.4E-08	4.0E-14	2.9E-07	15%	8.3E-02	7.5E-03	8.6E-05	9.1E-02	10%
Cobalt	1.68E+01	1.36E+09	P	NA	NA	1.9E-13	1.9E-13	<1%	1.9E-01	5.7E-03	NA	1.9E-01	22%
Iron	6.25E+04	1.36E+09	P	NA	NA	NA	NA	–	3.0E-01	9.0E-03	NA	3.1E-01	36%
Manganese	8.44E+02	1.36E+09	P	NA	NA	NA	NA	–	2.0E-02	1.5E-02	2.9E-03	3.8E-02	4%
Vanadium	9.21E+01	1.36E+09	P	NA	NA	NA	NA	–	4.4E-02	5.1E-02	NA	9.5E-02	11%
				Total ELCR			2E-06	100%	Total HI			0.9	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 330 × 130 × 1 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 3,300 × 0.30 × ABSd × 130 × 1 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 8 × 130 × 1 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 330 × 130 × 1) / (1,000,000 × 70 × 365 × RfDo)
HQd = (EPCs × 3,300 × 0.30 × ABSd × 130 × 1) / (1,000,000 × 70 × 365 × RfDa)
HQi = (EPCs / PEF × 8 × 130 × 1) / (365 × 24 × RfC)

Table E-7
Risk and Hazard Calculations for Hypothetical Future Adult Resident Exposure to Soil
BUILDING 1034
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Adult Resident
Receptor Age: Adult

				CANCER RISK					NON-CANCER HAZARD				
				Route-Specific Risk			Calculated	Percent	Route-Specific Hazard			Calculated	Percent
Constituent	EPCs (mg/kg)	PEF (m^3/kg)		Oral	Dermal	Inhalation	Risk	Total ELCR	Oral	Dermal	Inhalation	Hazard	Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	2.60E+00	1.36E+09	P	1.1E-06	5.8E-07	8.6E-14	1.7E-06	3%	NA	NA	NA	NA	–
Benzo(a)pyrene	4.00E+00	1.36E+09	P	1.7E-05	8.9E-06	3.2E-11	2.6E-05	50%	NA	NA	NA	NA	–
Benzo(b)fluoranthene	1.28E+00	1.36E+09	P	5.5E-07	2.8E-07	4.2E-14	8.3E-07	2%	NA	NA	NA	NA	–
Dibenzo(a,h)anthracene	2.20E+00	1.36E+09	P	9.4E-06	4.9E-06	7.3E-13	1.4E-05	28%	NA	NA	NA	NA	–
Indeno(1,2,3-cd)pyrene	2.80E+00	1.36E+09	P	1.2E-06	6.2E-07	9.3E-14	1.8E-06	4%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	4.03E+04	1.36E+09	P	NA	NA	NA	NA	–	5.5E-02	2.2E-03	5.7E-03	6.3E-02	16%
Arsenic	7.42E+00	1.36E+09	P	6.5E-06	7.8E-07	9.6E-12	7.3E-06	14%	3.4E-02	4.1E-03	3.5E-04	3.8E-02	10%
Cobalt	1.68E+01	1.36E+09	P	NA	NA	4.6E-11	4.6E-11	<1%	7.7E-02	3.1E-03	NA	8.0E-02	21%
Iron	6.25E+04	1.36E+09	P	NA	NA	NA	NA	–	1.2E-01	4.9E-03	NA	1.3E-01	33%
Manganese	8.44E+02	1.36E+09	P	NA	NA	NA	NA	–	8.3E-03	8.2E-03	1.2E-02	2.8E-02	7%
Vanadium	9.21E+01	1.36E+09	P	NA	NA	NA	NA	–	1.8E-02	2.8E-02	NA	4.6E-02	12%
				Total ELCR			5E-05	100%	Total HI			0.4	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 100 × 350 × 30 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 5,700 × 0.07 × ABSd × 350 × 30 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 24 × 350 × 30 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 100 × 350 × 30) / (1,000,000 × 70 × 10,950 × RfDo)
HQd = (EPCs × 5,700 × 0.07 × ABSd × 350 × 30) / (1,000,000 × 70 × 10,950 × RfDa)
HQi = (EPCs / PEF × 24 × 350 × 30) / (10,950 × 24 × RfC)

Table E-8
DATA ENTRY SHEET
Hypothetical Future Adult Resident Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g ($\mu g/m^3$)	OR	Soil gas conc., C_g (ppmv)	Constituent
95636	1.70E+01			1,2,4-Trimethylbenzene
108678	1.40E+01			1,3,5-Trimethylbenzene
106990	1.80E+01			1,3-Butadiene
71432	1.12E+01			Benzene
75274	5.80E+01			Bromodichloromethane
74839	5.70E+00			Methyl bromide
56235	9.40E+00			Carbon tetrachloride
67663	6.08E+03			Chloroform
124481	2.50E+00			Chlorodibromomethane
127184	4.80E+00			Tetrachloroethylene
79016	1.61E+01			Trichloroethylene
67630	5.90E+00			Isopropanol
622968	1.10E+01			4-Ethyltoluene
142825	1.43E+01			Heptane
591786	1.37E+01			2-Hexanone
64175	2.02E+01			Ethanol
109999	1.20E+01			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^oC)	Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4	0	0	SIC		

Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.5	

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	30	30	350

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	5.08E+04

Table E-9
INTERMEDIATE CALCULATIONS SHEET
Hypothetical Future Adult Resident Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
95636	1,2,4-Trimethylbenzene	11,642	2.89E-03	1.23E-01	1.77E-04	3.15E-03	3.15E-03	1.70E+01	0.10	1.26E+00	3.15E-03	4.00E+02	2.18E+04	2.35E-05	4.00E-04
108678	1,3,5-Trimethylbenzene	11,626	2.77E-03	1.17E-01	1.77E-04	3.13E-03	3.13E-03	1.40E+01	0.10	1.26E+00	3.13E-03	4.00E+02	2.32E+04	2.35E-05	3.29E-04
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	1.80E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	2.67E-05	4.81E-04
67641	Acetone	7,510	2.38E-05	1.01E-03	1.77E-04	6.73E-03	6.73E-03	4.20E+02	0.10	1.26E+00	6.73E-03	4.00E+02	1.07E+02	2.44E-05	1.02E-02
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	1.12E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	2.39E-05	2.68E-04
75274	Bromodichloromethane	8,626	9.14E-04	3.88E-02	1.77E-04	1.55E-03	1.55E-03	5.80E+01	0.10	1.26E+00	1.55E-03	4.00E+02	6.09E+08	2.24E-05	1.30E-03
74839	Methyl bromide	5,611	4.33E-03	1.84E-01	1.77E-04	3.78E-03	3.78E-03	5.70E+00	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	1.35E-04
56235	Carbon tetrachloride	7,818	1.83E-02	7.76E-01	1.77E-04	4.05E-03	4.05E-03	9.40E+00	0.10	1.26E+00	4.05E-03	4.00E+02	2.35E+03	2.38E-05	2.24E-04
67663	Chloroform	7,513	2.25E-03	9.56E-02	1.77E-04	5.40E-03	5.40E-03	6.08E+03	0.10	1.26E+00	5.40E-03	4.00E+02	3.37E+02	2.41E-05	1.46E-01
124481	Chlorodibromomethane	6,755	5.05E-04	2.14E-02	1.77E-04	1.03E-03	1.03E-03	2.50E+00	0.10	1.26E+00	1.03E-03	4.00E+02	1.78E+13	2.14E-05	5.34E-05
127184	Tetrachloroethylene	9,513	9.92E-03	4.21E-01	1.77E-04	3.74E-03	3.74E-03	4.80E+00	0.10	1.26E+00	3.74E-03	4.00E+02	4.49E+03	2.37E-05	1.14E-04
79016	Trichloroethylene	8,507	5.93E-03	2.52E-01	1.77E-04	4.10E-03	4.10E-03	1.61E+01	0.10	1.26E+00	4.10E-03	4.00E+02	2.13E+03	2.38E-05	3.83E-04
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	5.90E+00	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	2.45E-05	1.44E-04
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	1.10E+01	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	2.61E-04
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	1.43E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	2.36E-05	3.37E-04
540841	2,2,4-Trimethylpentane	7,787	4.09E-01	1.74E+01	1.77E-04	2.98E-03	2.98E-03	0.00E+00	0.10	1.26E+00	2.98E-03	4.00E+02	3.82E+04	2.34E-05	0.00E+00
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	1.37E+01	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	2.38E-05	3.26E-04
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	2.02E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	2.50E-05	5.05E-04
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	1.20E+01	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	2.39E-05	2.87E-04

Table E-10
RESULTS SHEET
Hypothetical Future Adult Resident Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	1,2,4-Trimethylbenzene	NA	5.5E-05
108678	1,3,5-Trimethylbenzene	NA	5.3E-05
106990	1,3-Butadiene	5.9E-09	2.3E-04
67641	Acetone	NA	3.2E-07
71432	Benzene	8.6E-10	8.6E-06
75274	Bromodichloromethane	NA	NA
74839	Methyl bromide	NA	2.6E-05
56235	Carbon tetrachloride	1.4E-09	1.1E-06
67663	Chloroform	1.4E-06	1.4E-03
124481	Chlorodibromomethane	5.9E-10	NA
127184	Tetrachloroethylene	2.8E-10	4.0E-07
79016	Trichloroethylene	3.1E-10	NA
67630	Isopropanol	NA	2.0E-08
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**1E-06**	**0.0018**

Table E-11
Risk and Hazard Calculations for Hypothetical Future Child Resident Exposure to Soil
BUILDING 1034
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Child Resident
Receptor Age: Child

Constituent	EPCs (mg/kg)	PEF (m^3/kg)		CANCER RISK: Route-Specific Risk Oral	Dermal	Inhalation	Calculated Risk	Percent Total ELCR	NON-CANCER HAZARD: Route-Specific Hazard Oral	Dermal	Inhalation	Calculated Hazard	Percent Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	2.60E+00	1.36E+09	P	2.1E-06	7.6E-07	1.7E-14	2.8E-06	3%	NA	NA	NA	NA	–
Benzo(a)pyrene	4.00E+00	1.36E+09	P	3.2E-05	1.2E-05	6.5E-12	4.4E-05	50%	NA	NA	NA	NA	–
Benzo(b)fluoranthene	1.28E+00	1.36E+09	P	1.0E-06	3.7E-07	8.5E-15	1.4E-06	2%	NA	NA	NA	NA	–
Dibenzo(a,h)anthracene	2.20E+00	1.36E+09	P	1.8E-05	6.4E-06	1.5E-13	2.4E-05	27%	NA	NA	NA	NA	–
Indeno(1,2,3-cd)pyrene	2.80E+00	1.36E+09	P	2.2E-06	8.2E-07	1.9E-14	3.1E-06	3%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	4.03E+04	1.36E+09	P	NA	NA	NA	NA	–	5.2E-01	1.4E-02	5.7E-03	5.4E-01	16%
Arsenic	7.42E+00	1.36E+09	P	1.2E-05	1.0E-06	1.9E-12	1.3E-05	15%	3.2E-01	2.7E-02	3.5E-04	3.4E-01	10%
Cobalt	1.68E+01	1.36E+09	P	NA	NA	9.1E-12	9.1E-12	<1%	7.2E-01	2.0E-02	NA	7.4E-01	22%
Iron	6.25E+04	1.36E+09	P	NA	NA	NA	NA	–	1.1E+00	3.2E-02	NA	1.2E+00	36%
Manganese	8.44E+02	1.36E+09	P	NA	NA	NA	NA	–	7.7E-02	5.4E-02	1.2E-02	1.4E-01	4%
Vanadium	9.21E+01	1.36E+09	P	NA	NA	NA	NA	–	1.7E-01	1.8E-01	NA	3.5E-01	11%
				Total ELCR			9E-05	100%	Total HI			3.3	100%

** HI Segregated by Target Site/Critical Effect:
CNS - Central nervous system
NA - Not available
NR - None reported
RBCs - Red blood cells

HI (liver) =	2	HI (gatrointestinal tract) =	1
HI (CNS) =	0.1	HI (skin) =	1
HI (blood) =	1	HI (vascular) =	0.3
HI (developmental) =	0.5	HI (NA) =	0.006

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 200 × 350 × 6 × CSFo) / (1,000,000 × 15 × 25,550)
ELCRd = (EPCs × 2,800 × 0.20 × ABSd × 350 × 6 × CSFa) / (1,000,000 × 15 × 25,550)
ELCRi = (EPCs / PEF × 24 × 350 × 6 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 200 × 350 × 6) / (1,000,000 × 15 × 2,190 × RfDo)
HQd = (EPCs × 2,800 × 0.20 × ABSd × 350 × 6) / (1,000,000 × 15 × 2,190 × RfDa)
HQi = (EPCs / PEF × 24 × 350 × 6) / (2,190 × 24 × RfC)

Table E-12
DATA ENTRY SHEET
Hypothetical Future Child Resident Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g ($\mu g/m^3$)	OR	Soil gas conc., C_g (ppmv)	Constituent
95636	1.70E+01			1,2,4-Trimethylbenzene
108678	1.40E+01			1,3,5-Trimethylbenzene
106990	1.80E+01			1,3-Butadiene
71432	1.12E+01			Benzene
75274	5.80E+01			Bromodichloromethane
74839	5.70E+00			Methyl bromide
56235	9.40E+00			Carbon tetrachloride
67663	6.08E+03			Chloroform
124481	2.50E+00			Chlorodibromomethane
127184	4.80E+00			Tetrachloroethylene
79016	1.61E+01			Trichloroethylene
67630	5.90E+00			Isopropanol
622968	1.10E+01			4-Ethyltoluene
142825	1.43E+01			Heptane
591786	1.37E+01			2-Hexanone
64175	2.02E+01			Ethanol
109999	1.20E+01			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^0C)	Totals must add up to value of Ls (cell F24)			Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
			Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, Enter value or 0 h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)			
15	152.4	14	152.4			SIC		

Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.5	

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	6	6	350

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1.89E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	5.08E+04

Table E-13
INTERMEDIATE CALCULATIONS SHEET
Hypothetical Future Child Resident Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
95636	1,2,4-Trimethylbenzene	11,642	2.89E-03	1.23E-01	1.77E-04	3.15E-03	3.15E-03	1.70E+01	0.10	1.26E+00	3.15E-03	4.00E+02	2.18E+04	2.35E-05	4.00E-04
108678	1,3,5-Trimethylbenzene	11,626	2.77E-03	1.17E-01	1.77E-04	3.13E-03	3.13E-03	1.40E+01	0.10	1.26E+00	3.13E-03	4.00E+02	2.32E+04	2.35E-05	3.29E-04
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	1.80E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	2.67E-05	4.81E-04
67641	Acetone	7,510	2.38E-05	1.01E-03	1.77E-04	6.73E-03	6.73E-03	4.20E+02	0.10	1.26E+00	6.73E-03	4.00E+02	1.07E+02	2.44E-05	1.02E-02
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	1.12E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	2.39E-05	2.68E-04
75274	Bromodichloromethane	8,626	9.14E-04	3.88E-02	1.77E-04	1.55E-03	1.55E-03	5.80E+01	0.10	1.26E+00	1.55E-03	4.00E+02	6.09E+08	2.24E-05	1.30E-03
74839	Methyl bromide	5,611	4.33E-03	1.84E-01	1.77E-04	3.78E-03	3.78E-03	5.70E+00	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	1.35E-04
56235	Carbon tetrachloride	7,818	1.83E-02	7.76E-01	1.77E-04	4.05E-03	4.05E-03	9.40E+00	0.10	1.26E+00	4.05E-03	4.00E+02	2.35E+03	2.38E-05	2.24E-04
67663	Chloroform	7,513	2.25E-03	9.56E-02	1.77E-04	5.40E-03	5.40E-03	6.08E+03	0.10	1.26E+00	5.40E-03	4.00E+02	3.37E+02	2.41E-05	1.46E-01
124481	Chlorodibromomethane	6,755	5.05E-04	2.14E-02	1.77E-04	1.03E-03	1.03E-03	2.50E+00	0.10	1.26E+00	1.03E-03	4.00E+02	1.78E+13	2.14E-05	5.34E-05
127184	Tetrachloroethylene	9,513	9.92E-03	4.21E-01	1.77E-04	3.74E-03	3.74E-03	4.80E+00	0.10	1.26E+00	3.74E-03	4.00E+02	4.49E+03	2.37E-05	1.14E-04
79016	Trichloroethylene	8,507	5.93E-03	2.52E-01	1.77E-04	4.10E-03	4.10E-03	1.61E+01	0.10	1.26E+00	4.10E-03	4.00E+02	2.13E+03	2.38E-05	3.83E-04
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	5.90E+00	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	2.45E-05	1.44E-04
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	1.10E+01	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	2.61E-04
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	1.43E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	2.36E-05	3.37E-04
540841	2,2,4-Trimethylpentane	7,787	4.09E-01	1.74E+01	1.77E-04	2.98E-03	2.98E-03	0.00E+00	0.10	1.26E+00	2.98E-03	4.00E+02	3.82E+04	2.34E-05	0.00E+00
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	1.37E+01	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	2.38E-05	3.26E-04
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	2.02E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	2.50E-05	5.05E-04
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	1.20E+01	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	2.39E-05	2.87E-04

Table E-14
RESULTS SHEET
Hypothetical Future Child Resident Exposure to Soil Gas
Building 1034
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	1,2,4-Trimethylbenzene	NA	5.5E-05
108678	1,3,5-Trimethylbenzene	NA	5.3E-05
106990	1,3-Butadiene	1.2E-09	2.3E-04
67641	Acetone	NA	3.2E-07
71432	Benzene	1.7E-10	8.6E-06
75274	Bromodichloromethane	NA	NA
74839	Methyl bromide	NA	2.6E-05
56235	Carbon tetrachloride	2.8E-10	1.1E-06
67663	Chloroform	2.8E-07	1.4E-03
124481	Chlorodibromomethane	1.2E-10	NA
127184	Tetrachloroethylene	5.5E-11	4.0E-07
79016	Trichloroethylene	6.3E-11	NA
67630	Isopropanol	NA	2.0E-08
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**3E-07**	**0.0018**

Table E-15
Risk and Hazard Calculations for Site Worker Exposure to Soil
BUILDING 1041
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Current / Future
Receptor Population: Site Worker
Receptor Age: Adult

Constituent	EPCs (mg/kg)	PEF (m^3/kg)		CANCER RISK: Route-Specific Risk Oral (ELCRo)	Dermal (ELCRd)	Inhalation (ELCRi)	Calculated Risk (ELCR)	Percent Total ELCR	NON-CANCER HAZARD: Route-Specific Hazard Oral (HQo)	Dermal (HQd)	Inhalation (HQi)	Calculated Hazard (HI)	Percent Total HI
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Polychlorinated Biphenyls													
Aroclor 1254	2.10E-01	1.36E+09	P	7.3E-08	2.9E-08	7.2E-15	1.0E-07	8%	5.1E-03	2.0E-03	NA	7.2E-03	5%
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	2.88E+04	1.36E+09	P	NA	NA	NA	NA	–	1.4E-02	9.3E-04	9.6E-04	1.6E-02	11%
Arsenic	3.59E+00	1.36E+09	P	9.4E-07	1.9E-07	9.2E-13	1.1E-06	92%	5.8E-03	1.2E-03	4.0E-05	7.0E-03	5%
Cobalt	2.44E+01	1.36E+09	P	NA	NA	1.3E-11	1.3E-11	<1%	4.0E-02	2.6E-03	NA	4.2E-02	28%
Iron	5.13E+04	1.36E+09	P	NA	NA	NA	NA	–	3.6E-02	2.4E-03	NA	3.8E-02	26%
Manganese	1.92E+03	1.36E+09	P	NA	NA	NA	NA	–	6.7E-03	1.1E-02	6.4E-03	2.4E-02	16%
Vanadium	5.87E+01	1.36E+09	P	NA	NA	NA	NA	–	4.1E-03	1.0E-02	NA	1.5E-02	10%
				Total ELCR			1E-06	100%	Total HI			0.1	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 50 × 250 × 25 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 3,300 × 0.10 × ABSd × 250 × 25 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 8 × 250 × 25 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 50 × 250 × 25) / (1,000,000 × 70 × 9,125 × RfDo)
HQd = (EPCs × 3,300 × 0.10 × ABSd × 250 × 25) / (1,000,000 × 70 × 9,125 × RfDa)
HQi = (EPCs / PEF × 8 × 250 × 25) / (9,125 × 24 × RfC)

Table E-16
DATA ENTRY SHEET
Industrial Exposure to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g ($\mu g/m^3$)	OR	Soil gas conc., C_g (ppmv)	Constituent
106990	3.70E+01			1,3-Butadiene
71432	2.10E+01			Benzene
67663	3.70E+02			Chloroform
127184	5.40E+02			Tetrachloroethylene
79016	3.30E+03			Trichloroethylene
67630	9.90E-01			Isopropanol
622968	1.60E+00			4-Ethyltoluene
142825	4.09E+01			Heptane
591786	2.10E+00			2-Hexanone
64175	2.30E+01			Ethanol
109999	7.10E+00			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^oC)	Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4			SIC		

Stratum A SCS soil type	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)		Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.83		

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	25	25	250

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	8.44E+04

Table E-17
INTERMEDIATE CALCULATIONS SHEET
Industrial Exposure to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	3.70E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	1.61E-05	5.96E-04
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	2.10E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	1.44E-05	3.02E-04
67663	Chloroform	7,513	2.25E-03	9.56E-02	1.77E-04	5.40E-03	5.40E-03	3.70E+02	0.10	1.26E+00	5.40E-03	4.00E+02	3.37E+02	1.45E-05	5.37E-03
127184	Tetrachloroethylene	9,513	9.92E-03	4.21E-01	1.77E-04	3.74E-03	3.74E-03	5.40E+02	0.10	1.26E+00	3.74E-03	4.00E+02	4.49E+03	1.43E-05	7.71E-03
79016	Trichloroethylene	8,507	5.93E-03	2.52E-01	1.77E-04	4.10E-03	4.10E-03	3.30E+03	0.10	1.26E+00	4.10E-03	4.00E+02	2.13E+03	1.43E-05	4.73E-02
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	9.90E-01	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	1.47E-05	1.46E-05
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	1.60E+00	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	1.43E-05	2.29E-05
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	4.09E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	1.42E-05	5.81E-04
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	2.10E+00	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	1.43E-05	3.01E-05
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	2.30E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	1.51E-05	3.47E-04
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	7.10E+00	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	1.44E-05	1.02E-04

Table E-18
RESULTS SHEET
Industrial Exposure to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	1,2,4-Trimethylbenzene	NA	0.0E+00
108678	1,3,5-Trimethylbenzene	NA	0.0E+00
106990	1,3-Butadiene	1.5E-09	6.8E-05
67641	Acetone	NA	0.0E+00
71432	Benzene	1.9E-10	2.3E-06
75274	Bromodichloromethane	NA	NA
74839	Methyl bromide	NA	0.0E+00
56235	Carbon tetrachloride	0.0E+00	0.0E+00
67663	Chloroform	1.0E-08	1.3E-05
124481	Chlorodibromomethane	0.0E+00	NA
127184	Tetrachloroethylene	3.7E-09	6.5E-06
79016	Trichloroethylene	7.7E-09	NA
67630	Isopropanol	NA	4.8E-10
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
540841	2,2,4-Trimethylpentane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**2E-08**	**0.00009**

Table E-19
Risk and Hazard Calculations for Hypothetical Future Construction Worker Exposure to Soil
BUILDING 1041
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

				CANCER RISK					NON-CANCER HAZARD				
				Route-Specific Risk			Calculated	Percent	Route-Specific Hazard			Calculated	Percent
Constituent	EPCs (mg/kg)	PEF (m^3/kg)		Oral	Dermal	Inhalation	Risk	Total ELCR	Oral	Dermal	Inhalation	Hazard	Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Polychlorinated Biphenyls													
Aroclor 1254	2.10E-01	1.36E+09	P	1.0E-08	1.8E-09	1.5E-16	1.2E-08	8%	1.4E-02	2.5E-03	NA	1.7E-02	2%
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	2.88E+04	1.36E+09	P	NA	NA	NA	NA	–	9.7E-02	2.9E-03	1.0E-03	1.0E-01	12%
Arsenic	3.59E+00	1.36E+09	P	1.3E-07	1.2E-08	1.9E-14	1.4E-07	92%	4.0E-02	3.6E-03	4.2E-05	4.4E-02	5%
Cobalt	2.44E+01	1.36E+09	P	NA	NA	2.7E-13	2.7E-13	<1%	2.7E-01	8.2E-03	NA	2.8E-01	33%
Iron	5.13E+04	1.36E+09	P	NA	NA	NA	NA	–	2.5E-01	7.4E-03	NA	2.5E-01	30%
Manganese	1.92E+03	1.36E+09	P	NA	NA	NA	NA	–	4.6E-02	3.5E-02	6.7E-03	8.7E-02	10%
Vanadium	5.87E+01	1.36E+09	P	NA	NA	NA	NA	–	2.8E-02	3.3E-02	NA	6.1E-02	7%
				Total ELCR			2E-07	100%	Total HI			0.8	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 330 × 130 × 1 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 3,300 × 0.30 × ABSd × 130 × 1 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 8 × 130 × 1 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 330 × 130 × 1) / (1,000,000 × 70 × 365 × RfDo)
HQd = (EPCs × 3,300 × 0.30 × ABSd × 130 × 1) / (1,000,000 × 70 × 365 × RfDa)
HQi = (EPCs / PEF × 8 × 130 × 1) / (365 × 24 × RfC)

Table E-20
Risk and Hazard Calculations for Hypothetical Future Adult Resident Exposure to Soil
BUILDING 1041
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Adult Resident
Receptor Age: Adult

Constituent	EPCs (mg/kg)	PEF (m^3/kg)		CANCER RISK Route-Specific Risk Oral	Dermal	Inhalation	Calculated Risk	Percent Total ELCR	NON-CANCER HAZARD Route-Specific Hazard Oral	Dermal	Inhalation	Calculated Hazard	Percent Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Polychlorinated Biphenyls													
Aroclor 1254	2.10E-01	1.36E+09	P	2.5E-07	5.9E-08	3.6E-14	3.1E-07	8%	1.4E-02	3.4E-03	NA	1.8E-02	5%
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	2.88E+04	1.36E+09	P	NA	NA	NA	NA	–	3.9E-02	1.6E-03	4.1E-03	4.5E-02	11%
Arsenic	3.59E+00	1.36E+09	P	3.2E-06	3.8E-07	4.6E-12	3.5E-06	92%	1.6E-02	2.0E-03	1.7E-04	1.9E-02	5%
Cobalt	2.44E+01	1.36E+09	P	NA	NA	6.6E-11	6.6E-11	<1%	1.1E-01	4.4E-03	NA	1.2E-01	29%
Iron	5.13E+04	1.36E+09	P	NA	NA	NA	NA	–	1.0E-01	4.0E-03	NA	1.0E-01	26%
Manganese	1.92E+03	1.36E+09	P	NA	NA	NA	NA	–	1.9E-02	1.9E-02	2.7E-02	6.4E-02	16%
Vanadium	5.87E+01	1.36E+09	P	NA	NA	NA	NA	–	1.1E-02	1.8E-02	NA	2.9E-02	7%
				Total ELCR			4E-06	100%	Total HI			0.4	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 100 × 350 × 30 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 5,700 × 0.07 × ABSd × 350 × 30 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 24 × 350 × 30 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 100 × 350 × 30) / (1,000,000 × 70 × 10,950 × RfDo)
HQd = (EPCs × 5,700 × 0.07 × ABSd × 350 × 30) / (1,000,000 × 70 × 10,950 × RfDa)
HQi = (EPCs / PEF × 24 × 350 × 30) / (10,950 × 24 × RfC)

Table E-21
DATA ENTRY SHEET
Hypothetical Future Adult Resident Expousre to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g ($\mu g/m^3$)	OR	Soil gas conc., C_g (ppmv)	Constituent
106990	3.70E+01			1,3-Butadiene
71432	2.10E+01			Benzene
67663	3.70E+02			Chloroform
127184	5.40E+02			Tetrachloroethylene
79016	3.30E+03			Trichloroethylene
67630	9.90E-01			Isopropanol
622968	1.60E+00			4-Ethyltoluene
142825	4.09E+01			Heptane
591786	2.10E+00			2-Hexanone
64175	2.30E+01			Ethanol
109999	7.10E+00			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^oC)	Totals must add up to value of Ls (cell F24): Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4			SIC		

Stratum A SCS soil type	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.5	

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	30	30	350

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	5.08E+04

Table E-22
INTERMEDIATE CALCULATIONS SHEET
Hypothetical Future Adult Resident Expousre to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	3.70E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	2.67E-05	9.89E-04
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	2.10E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	2.39E-05	5.02E-04
67663	Chloroform	7,513	2.25E-03	9.56E-02	1.77E-04	5.40E-03	5.40E-03	3.70E+02	0.10	1.26E+00	5.40E-03	4.00E+02	3.37E+02	2.41E-05	8.91E-03
127184	Tetrachloroethylene	9,513	9.92E-03	4.21E-01	1.77E-04	3.74E-03	3.74E-03	5.40E+02	0.10	1.26E+00	3.74E-03	4.00E+02	4.49E+03	2.37E-05	1.28E-02
79016	Trichloroethylene	8,507	5.93E-03	2.52E-01	1.77E-04	4.10E-03	4.10E-03	3.30E+03	0.10	1.26E+00	4.10E-03	4.00E+02	2.13E+03	2.38E-05	7.85E-02
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	9.90E-01	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	2.45E-05	2.42E-05
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	1.60E+00	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	3.79E-05
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	4.09E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	2.36E-05	9.65E-04
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	2.10E+00	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	2.38E-05	5.00E-05
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	2.30E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	2.50E-05	5.75E-04
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	7.10E+00	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	2.39E-05	1.70E-04

Table E-23
RESULTS SHEET
Hypothetical Future Adult Resident Expousre to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
106990	1,3-Butadiene	1.2E-08	4.7E-04
71432	Benzene	1.6E-09	1.6E-05
67663	Chloroform	8.4E-08	8.7E-05
127184	Tetrachloroethylene	3.1E-08	4.5E-05
79016	Trichloroethylene	6.5E-08	NA
67630	Isopropanol	NA	3.3E-09
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**2E-07**	**0.0006**

Table E-24
Risk and Hazard Calculations for Hypothetical Future Child Resident Exposure to Soil
BUILDING 1041
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Child Resident
Receptor Age: Child

Constituent	EPCs (mg/kg)	PEF (m^3/kg)		CANCER RISK: Route-Specific Risk Oral	Dermal	Inhalation	Calculated Risk	Percent Total ELCR	NON-CANCER HAZARD: Route-Specific Hazard Oral	Dermal	Inhalation	Calculated Hazard	Percent Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Polychlorinated Biphenyls													
Aroclor 1254	2.10E-01	1.36E+09	P	4.6E-07	7.7E-08	7.2E-15	5.4E-07	8%	1.3E-01	2.3E-02	NA	1.6E-01	5%
Explosives													
Nitroglycerine	–	–		–	–	–	–	–	–	–	–	–	–
Inorganics													
Aluminum	2.88E+04	1.36E+09	P	NA	NA	NA	NA	–	3.7E-01	1.0E-02	4.1E-03	3.8E-01	12%
Arsenic	3.59E+00	1.36E+09	P	5.9E-06	5.0E-07	9.3E-13	6.4E-06	92%	1.5E-01	1.3E-02	1.7E-04	1.7E-01	5%
Cobalt	2.44E+01	1.36E+09	P	NA	NA	1.3E-11	1.3E-11	<1%	1.0E+00	2.9E-02	NA	1.1E+00	33%
Iron	5.13E+04	1.36E+09	P	NA	NA	NA	NA	–	9.4E-01	2.6E-02	NA	9.6E-01	29%
Manganese	1.92E+03	1.36E+09	P	NA	NA	NA	NA	–	1.7E-01	1.2E-01	2.7E-02	3.2E-01	10%
Vanadium	5.87E+01	1.36E+09	P	NA	NA	NA	NA	–	1.1E-01	1.2E-01	NA	2.2E-01	7%
				Total ELCR			7E-06	100%	Total HI			3.3	100%

** HI Segregated by Target Site/Critical Effect:
CNS - Central nervous system
NA - Not available
NR - None reported
RBCs - Red blood cells

HI (liver) =	1	HI (gatrointestinal tract) =	1
HI (CNS) =	0.3	HI (skin) =	1
HI (blood) =	1	HI (vascular) =	0.2
HI (developmental) =	0.4	HI (eyes, nails, immune system) =	0.2
		HI (NA) =	0.004

[a] Minimum of the volatilization factor (identified with "V") and the particulate emission factor (PEF) (identified with "P"), both derived on Table 5-10.

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 200 × 350 × 6 × CSFo) / (1,000,000 × 15 × 25,550)
ELCRd = (EPCs × 2,800 × 0.20 × ABSd × 350 × 6 × CSFa) / (1,000,000 × 15 × 25,550)
ELCRi = (EPCs / PEF × 24 × 350 × 6 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 200 × 350 × 6) / (1,000,000 × 15 × 2,190 × RfDo)
HQd = (EPCs × 2,800 × 0.20 × ABSd × 350 × 6) / (1,000,000 × 15 × 2,190 × RfDa)
HQi = (EPCs / PEF × 24 × 350 × 6) / (2,190 × 24 × RfC)

Table E-25
DATA ENTRY SHEET
Hypothetical Future Child Resident Expousre to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g ($\mu g/m^3$)	OR	Soil gas conc., C_g (ppmv)	Constituent
106990	3.70E+01			1,3-Butadiene
71432	2.10E+01			Benzene
67663	3.70E+02			Chloroform
127184	5.40E+02			Tetrachloroethylene
79016	3.30E+03			Trichloroethylene
67630	9.90E-01			Isopropanol
622968	1.60E+00			4-Ethyltoluene
142825	4.09E+01			Heptane
591786	2.10E+00			2-Hexanone
64175	2.30E+01			Ethanol
109999	7.10E+00			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^oC)	Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4			SIC		

Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	OR	Average vapor flow rate into bldg. Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.5		

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	6	6	350

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1.89E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	5.08E+04

Table E-26
INTERMEDIATE CALCULATIONS SHEET
Hypothetical Future Child Resident Expousre to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	3.70E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	2.67E-05	9.89E-04
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	2.10E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	2.39E-05	5.02E-04
67663	Chloroform	7,513	2.25E-03	9.56E-02	1.77E-04	5.40E-03	5.40E-03	3.70E+02	0.10	1.26E+00	5.40E-03	4.00E+02	3.37E+02	2.41E-05	8.91E-03
127184	Tetrachloroethylene	9,513	9.92E-03	4.21E-01	1.77E-04	3.74E-03	3.74E-03	5.40E+02	0.10	1.26E+00	3.74E-03	4.00E+02	4.49E+03	2.37E-05	1.28E-02
79016	Trichloroethylene	8,507	5.93E-03	2.52E-01	1.77E-04	4.10E-03	4.10E-03	3.30E+03	0.10	1.26E+00	4.10E-03	4.00E+02	2.13E+03	2.38E-05	7.85E-02
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	9.90E-01	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	2.45E-05	2.42E-05
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	1.60E+00	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	3.79E-05
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	4.09E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	2.36E-05	9.65E-04
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	2.10E+00	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	2.38E-05	5.00E-05
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	2.30E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	2.50E-05	5.75E-04
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	7.10E+00	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	2.39E-05	1.70E-04

Table E-27
RESULTS SHEET
Hypothetical Future Child Resident Expousre to Soil Gas
Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
106990	1,3-Butadiene	2.4E-09	4.7E-04
71432	Benzene	3.2E-10	1.6E-05
67663	Chloroform	1.7E-08	8.7E-05
127184	Tetrachloroethylene	6.2E-09	4.5E-05
79016	Trichloroethylene	1.3E-08	NA
67630	Isopropanol	NA	3.3E-09
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**4E-08**	**0.0006**

Table E-28
Risk and Hazard Calculations for Site Worker Exposure to Soil
BUILDING 1549
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Current / Future
Receptor Population: Site Worker
Receptor Age: Adult

Constituent	EPCs (mg/kg)	PEF (m^3/kg)		CANCER RISK: Route-Specific Risk Oral	Dermal	Inhalation	Calculated Risk	Percent Total ELCR	NON-CANCER HAZARD: Route-Specific Hazard Oral	Dermal	Inhalation	Calculated Hazard	Percent Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	1.80E-01	1.36E+09	P	2.3E-08	2.0E-08	1.2E-15	4.3E-08	2%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	2.50E+00	1.36E+09	P	7.4E-09	4.9E-09	NA	1.2E-08	<1%	1.2E-02	8.1E-03	NA	2.0E-02	17%
Inorganics													
Aluminum	3.22E+04	1.36E+09	P	NA	NA	NA	NA	–	1.6E-02	1.0E-03	1.1E-03	1.8E-02	15%
Arsenic	5.45E+00	1.36E+09	P	1.4E-06	2.8E-07	1.4E-12	1.7E-06	97%	8.9E-03	1.8E-03	6.1E-05	1.1E-02	9%
Cobalt	9.84E+00	1.36E+09	P	NA	NA	5.3E-12	5.3E-12	<1%	1.6E-02	1.1E-03	NA	1.7E-02	15%
Iron	3.96E+04	1.36E+09	P	NA	NA	NA	NA	–	2.8E-02	1.8E-03	NA	2.9E-02	25%
Manganese	3.33E+02	1.36E+09	P	NA	NA	NA	NA	–	1.2E-03	1.9E-03	1.1E-03	4.2E-03	4%
Vanadium	7.18E+01	1.36E+09	P	NA	NA	NA	NA	–	5.0E-03	1.3E-02	NA	1.8E-02	15%
				Total ELCR			2E-06	99%	Total HI			0.1	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 50 × 250 × 25 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 3,300 × 0.10 × ABSd × 250 × 25 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 8 × 250 × 25 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 50 × 250 × 25) / (1,000,000 × 70 × 9,125 × RfDo)
HQd = (EPCs × 3,300 × 0.10 × ABSd × 250 × 25) / (1,000,000 × 70 × 9,125 × RfDa)
HQi = (EPCs / PEF × 8 × 250 × 25) / (9,125 × 24 × RfC)

Table E-29
DATA ENTRY SHEET
Industrial Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Constituents
95636	1.10E+02			1,2,4-Trimethylbenzene
108678	9.40E+01			1,3,5-Trimethylbenzene
106990	3.60E+01			1,3-Butadiene
106467	3.20E+00			1,4-Dichlorobenzene
71432	2.30E+01			Benzene
100414	5.94E+00			Ethylbenzene
67630	9.85E+00			Isopropanol
622968	4.26E+01			4-Ethyltoluene
142825	4.09E+01			Heptane
540841	1.80E+02			2,2,4-Trimethylpentane
591786	1.50E+01			2-Hexanone
64175	7.70E+01			Ethanol
109999	1.50E+01			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (°C)	Totals must add up to value of Ls (cell F24): Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4			SIC		

Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm-s^2)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.83	

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	25	25	250

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	137.4	0.265	ERROR	ERROR	0.284	1.49E-09	0.844	1.26E-09	4,000	8.44E+04

Table E-30
INTERMEDIATE CALCULATIONS SHEET
Industrial Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)
95636	1,2,4-Trimethylbenzene	11,642	2.89E-03	1.23E-01	1.77E-04	3.15E-03	3.15E-03	1.10E+02	0.10	1.26E+00	3.15E-03	4.00E+02	2.18E+04	1.42E-05	1.56E-03
108678	1,3,5-Trimethylbenzene	11,626	2.77E-03	1.17E-01	1.77E-04	3.13E-03	3.13E-03	9.40E+01	0.10	1.26E+00	3.13E-03	4.00E+02	2.32E+04	1.42E-05	1.33E-03
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	3.60E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	1.61E-05	5.80E-04
106467	1,4-Dichlorobenzene	11,202	1.16E-03	4.92E-02	1.77E-04	3.58E-03	3.58E-03	3.20E+00	0.10	1.26E+00	3.58E-03	4.00E+02	6.41E+03	1.43E-05	4.56E-05
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	2.30E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	1.44E-05	3.31E-04
100414	Ethylbenzene	10,110	4.09E-03	1.74E-01	1.77E-04	3.89E-03	3.89E-03	5.94E+00	0.10	1.26E+00	3.89E-03	4.00E+02	3.20E+03	1.43E-05	8.50E-05
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	9.85E+00	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	1.47E-05	1.45E-04
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	4.26E+01	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	1.43E-05	6.09E-04
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	4.09E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	1.42E-05	5.81E-04
540841	2,2,4-Trimethylpentane	7,787	4.09E-01	1.74E+01	1.77E-04	2.98E-03	2.98E-03	1.80E+02	0.10	1.26E+00	2.98E-03	4.00E+02	3.82E+04	1.41E-05	2.54E-03
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	1.50E+01	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	1.43E-05	2.15E-04
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	7.70E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	1.51E-05	1.16E-03
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	1.50E+01	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	1.44E-05	2.16E-04

Table E-31
RESULTS SHEET
Industrial Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	1,2,4-Trimethylbenzene	NA	5.1E-05
108678	1,3,5-Trimethylbenzene	NA	5.1E-05
106990	1,3-Butadiene	1.4E-09	6.6E-05
106467	1,4-Dichlorobenzene	4.1E-11	1.3E-08
71432	Benzene	2.1E-10	2.5E-06
100414	Ethylbenzene	1.7E-11	1.9E-08
67630	Isopropanol	NA	4.7E-09
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
540841	2,2,4-Trimethylpentane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**2E-09**	**0.0002**

Table E-32
Risk and Hazard Calculations for Hypothetical Future Construction Worker Exposure to Soil
BUILDING 1549
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

				CANCER RISK					NON-CANCER HAZARD				
				Route-Specific Risk			Calculated	Percent	Route-Specific Hazard			Calculated	Percent
Constituent	EPCs (mg/kg)	PEF (m^3/kg)		Oral	Dermal	Inhalation	Risk	Total ELCR	Oral	Dermal	Inhalation	Hazard	Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	1.80E-01	1.36E+09	P	3.2E-09	1.2E-09	2.5E-17	4.4E-09	2%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	2.50E+00	1.36E+09	P	1.0E-09	3.1E-10	NA	1.3E-09	<1%	8.4E-02	2.5E-02	NA	1.1E-01	16%
Inorganics													
Aluminum	3.22E+04	1.36E+09	P	NA	NA	NA	NA	–	1.1E-01	3.2E-03	1.1E-03	1.1E-01	16%
Arsenic	5.45E+00	1.36E+09	P	2.0E-07	1.8E-08	2.9E-14	2.1E-07	97%	6.1E-02	5.5E-03	6.3E-05	6.7E-02	10%
Cobalt	9.84E+00	1.36E+09	P	NA	NA	1.1E-13	1.1E-13	<1%	1.1E-01	3.3E-03	NA	1.1E-01	17%
Iron	3.96E+04	1.36E+09	P	NA	NA	NA	NA	–	1.9E-01	5.7E-03	NA	2.0E-01	28%
Manganese	3.33E+02	1.36E+09	P	NA	NA	NA	NA	–	8.0E-03	6.0E-03	1.2E-03	1.5E-02	2%
Vanadium	7.18E+01	1.36E+09	P	NA	NA	NA	NA	–	3.5E-02	4.0E-02	NA	7.4E-02	11%
				Total ELCR			2E-07	99%	Total HI			0.7	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 330 × 130 × 1 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 3,300 × 0.30 × ABSd × 130 × 1 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 8 × 130 × 1 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 330 × 130 × 1) / (1,000,000 × 70 × 365 × RfDo)
HQd = (EPCs × 3,300 × 0.30 × ABSd × 130 × 1) / (1,000,000 × 70 × 365 × RfDa)
HQi = (EPCs / PEF × 8 × 130 × 1) / (365 × 24 × RfC)

Table E-33
Risk and Hazard Calculations for Hypothetical Future Adult Resident Exposure to Combined Soil
BUILDING 1549
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Adult Resident
Receptor Age: Adult

				CANCER RISK					NON-CANCER HAZARD				
				Route-Specific Risk			Calculated	Percent	Route-Specific Hazard			Calculated	Percent
Constituent	EPCs (mg/kg)	PEF (m^3/kg)		Oral	Dermal	Inhalation	Risk	Total ELCR	Oral	Dermal	Inhalation	Hazard	Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	1.80E-01	1.36E+09	P	7.7E-08	4.0E-08	6.0E-15	1.2E-07	2%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	2.50E+00	1.36E+09	P	2.5E-08	1.0E-08	NA	3.5E-08	<1%	3.4E-02	1.4E-02	NA	4.8E-02	18%
Inorganics													
Aluminum	3.22E+04	1.36E+09	P	NA	NA	NA	NA	–	4.4E-02	1.8E-03	4.5E-03	5.0E-02	17%
Arsenic	5.45E+00	1.36E+09	P	4.8E-06	5.7E-07	7.1E-12	5.4E-06	97%	2.5E-02	3.0E-03	2.6E-04	2.8E-02	11%
Cobalt	9.84E+00	1.36E+09	P	NA	NA	2.7E-11	2.7E-11	<1%	4.5E-02	1.8E-03	NA	4.7E-02	17%
Iron	3.96E+04	1.36E+09	P	NA	NA	NA	NA	–	7.7E-02	3.1E-03	NA	8.1E-02	30%
Manganese	3.33E+02	1.36E+09	P	NA	NA	NA	NA	–	3.3E-03	3.2E-03	4.7E-03	1.1E-02	2%
Vanadium	7.18E+01	1.36E+09	P	NA	NA	NA	NA	–	1.4E-02	2.2E-02	NA	3.6E-02	5%
				Total ELCR			6E-06	99%	Total HI			0.3	100%

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 100 × 350 × 30 × CSFo) / (1,000,000 × 70 × 25,550)
ELCRd = (EPCs × 5,700 × 0.07 × ABSd × 350 × 30 × CSFa) / (1,000,000 × 70 × 25,550)
ELCRi = (EPCs / PEF × 24 × 350 × 30 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 100 × 350 × 30) / (1,000,000 × 70 × 10,950 × RfDo)
HQd = (EPCs × 5,700 × 0.07 × ABSd × 350 × 30) / (1,000,000 × 70 × 10,950 × RfDa)
HQi = (EPCs / PEF × 24 × 350 × 30) / (10,950 × 24 × RfC)

Table E-34
DATA ENTRY SHEET
Hypothetical Future Adult Residential Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g (µg/m^3)	OR	Soil gas conc., C_g (ppmv)	Constituent
95636	1.10E+02			1,2,4-Trimethylbenzene
108678	9.40E+01			1,3,5-Trimethylbenzene
106990	3.60E+01			1,3-Butadiene
106467	3.20E+00			1,4-Dichlorobenzene
71432	2.30E+01			Benzene
100414	5.94E+00			Ethylbenzene
67630	9.85E+00			Isopropanol
622968	4.26E+01			4-Ethyltoluene
142825	4.09E+01			Heptane
540841	1.80E+02			2,2,4-Trimethylpentane
591786	1.50E+01			2-Hexanone
64175	7.70E+01			Ethanol
109999	1.50E+01			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^{0}C)	Totals must add up to value of Ls (cell F24): Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4			SIC		

Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP (g/cm-s^2)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)	Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.5	

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	30	30	350

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
9.46E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	5.08E+04

Table E-35
INTERMEDIATE CALCULATIONS SHEET
Hypothetical Future Adult Residential Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
95636	1,2,4-Trimethylbenzene	11,642	2.89E-03	1.23E-01	1.77E-04	3.15E-03	3.15E-03	1.10E+02	0.10	1.26E+00	3.15E-03	4.00E+02	2.18E+04	2.35E-05	2.59E-03
108678	1,3,5-Trimethylbenzene	11,626	2.77E-03	1.17E-01	1.77E-04	3.13E-03	3.13E-03	9.40E+01	0.10	1.26E+00	3.13E-03	4.00E+02	2.32E+04	2.35E-05	2.21E-03
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	3.60E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	2.67E-05	9.63E-04
106467	1,4-Dichlorobenzene	11,202	1.16E-03	4.92E-02	1.77E-04	3.58E-03	3.58E-03	3.20E+00	0.10	1.26E+00	3.58E-03	4.00E+02	6.41E+03	2.37E-05	7.57E-05
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	2.30E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	2.39E-05	5.50E-04
100414	Ethylbenzene	10,110	4.09E-03	1.74E-01	1.77E-04	3.89E-03	3.89E-03	5.94E+00	0.10	1.26E+00	3.89E-03	4.00E+02	3.20E+03	2.37E-05	1.41E-04
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	9.85E+00	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	2.45E-05	2.41E-04
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	4.26E+01	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	1.01E-03
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	4.09E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	2.36E-05	9.65E-04
540841	2,2,4-Trimethylpentane	7,787	4.09E-01	1.74E+01	1.77E-04	2.98E-03	2.98E-03	1.80E+02	0.10	1.26E+00	2.98E-03	4.00E+02	3.82E+04	2.34E-05	4.22E-03
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	1.50E+01	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	2.38E-05	3.57E-04
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	7.70E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	2.50E-05	1.93E-03
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	1.50E+01	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	2.39E-05	3.59E-04

Table E-36
RESULTS SHEET
Hypothetical Future Adult Residential Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	1,2,4-Trimethylbenzene	NA	3.5E-04
108678	1,3,5-Trimethylbenzene	NA	3.5E-04
106990	1,3-Butadiene	1.2E-08	4.6E-04
106467	1,4-Dichlorobenzene	3.4E-10	9.1E-08
71432	Benzene	1.8E-09	1.8E-05
100414	Ethylbenzene	1.4E-10	1.4E-07
67630	Isopropanol	NA	3.3E-08
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
540841	2,2,4-Trimethylpentane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**1E-08**	**0.001**

Table E-37
Risk and Hazard Calculations for Hypothetical Future Child Resident Exposure to Soil
BUILDING 1549
REASONABLE MAXIMUM EXPOSURE
RAAP-047 RFI Report, Radford Army Amunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Child Resident
Receptor Age: Child

Constituent	EPCs (mg/kg)	PEF (m^3/kg)		CANCER RISK: Route-Specific Risk Oral	Dermal	Inhalation	Calculated Risk	Percent Total ELCR	NON-CANCER HAZARD: Route-Specific Hazard Oral	Dermal	Inhalation	Calculated Hazard	Percent Total HI
				ELCRo	ELCRd	ELCRi	ELCR		HQo	HQd	HQi	HI	
Semi-Volatile Organic Compounds													
Benzo(a)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–		–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–		–	–	–	–	–	–	–	–	–	–
Dibenzo(a,h)anthracene	–	–		–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	1.80E-01	1.36E+09	P	1.4E-07	5.2E-08	1.2E-15	2.0E-07	2%	NA	NA	NA	NA	–
Polychlorinated Biphenyls													
Aroclor 1254	–	–		–	–	–	–	–	–	–	–	–	–
Explosives													
Nitroglycerine	2.50E+00	1.36E+09	P	4.7E-08	1.3E-08	NA	6.0E-08	<1%	3.2E-01	8.9E-02	NA	4.1E-01	18%
Inorganics													
Aluminum	3.22E+04	1.36E+09	P	NA	NA	NA	NA	–	4.1E-01	1.2E-02	4.5E-03	4.3E-01	17%
Arsenic	5.45E+00	1.36E+09	P	9.0E-06	7.5E-07	1.4E-12	9.7E-06	97%	2.3E-01	1.9E-02	2.6E-04	2.5E-01	11%
Cobalt	9.84E+00	1.36E+09	P	NA	NA	5.3E-12	5.3E-12	<1%	4.2E-01	1.2E-02	NA	4.3E-01	17%
Iron	3.96E+04	1.36E+09	P	NA	NA	NA	NA	–	7.2E-01	2.0E-02	NA	7.4E-01	30%
Manganese	3.33E+02	1.36E+09	P	NA	NA	NA	NA	–	3.0E-02	2.1E-02	4.7E-03	5.6E-02	2%
Vanadium	7.18E+01	1.36E+09	P	NA	NA	NA	NA	–	1.3E-01	1.4E-01	NA	2.7E-01	5%
				Total ELCR			1E-05	99%	Total HI			2.6	100%

** HI Segregated by Target Site/Critical Effect:

CNS - Central nervous system	NR - None reported	HI (liver) =	1	HI (gatrointestinal tract) =	0.7
NA - Not available	RBCs - Red blood cells	HI (CNS) =	0.06	HI (skin) =	0.7
		HI (blood) =	0.7	HI (vascular) =	0.3
		HI (developmental) =	0.4	HI (NA) =	0.005

–	Not applicable.	HQ	Hazard quotient.	PEF	Particulate emission factor.
ELCR	Excess lifetime cancer risk.	mg/kg	Milligrams per kilogram.		
EPCs	Exposure point concentration in soil (mg/kg).	NA	Not available.		
HI	Hazard index (sum of the HQs).	NC	Not evaluated as a carcinogen.		

Equations: (see Table 5-9)

ELCRo = (EPCs × 1 × 200 × 350 × 6 × CSFo) / (1,000,000 × 15 × 25,550)
ELCRd = (EPCs × 2,800 × 0.20 × ABSd × 350 × 6 × CSFa) / (1,000,000 × 15 × 25,550)
ELCRi = (EPCs / PEF × 24 × 350 × 6 × URF) / (25,550 × 24)

HQo = (EPCs × 1 × 200 × 350 × 6) / (1,000,000 × 15 × 2,190 × RfDo)
HQd = (EPCs × 2,800 × 0.20 × ABSd × 350 × 6) / (1,000,000 × 15 × 2,190 × RfDa)
HQi = (EPCs / PEF × 24 × 350 × 6) / (2,190 × 24 × RfC)

Table E-38
DATA ENTRY SHEET
Hypothetical Future Child Resident Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Soil Gas Concentration Data

Chemical CAS No. (numbers only, no dashes)	Soil gas conc., C_g ($\mu g/m^3$)	OR	Soil gas conc., C_g (ppmv)	Constituent
95636	1.10E+02			1,2,4-Trimethylbenzene
108678	9.40E+01			1,3,5-Trimethylbenzene
106990	3.60E+01			1,3-Butadiene
106467	3.20E+00			1,4-Dichlorobenzene
71432	2.30E+01			Benzene
100414	5.94E+00			Ethylbenzene
67630	9.85E+00			Isopropanol
622968	4.26E+01			4-Ethyltoluene
142825	4.09E+01			Heptane
540841	1.80E+02			2,2,4-Trimethylpentane
591786	1.50E+01			2-Hexanone
64175	7.70E+01			Ethanol
109999	1.50E+01			Tetrahydrofuran

Depth below grade to bottom of enclosed space floor, L_F (cm)	Soil gas sampling depth below grade, L_s (cm)	Average soil temperature, T_S (^oC)	Totals must add up to value of Ls (cell F24): Thickness of soil stratum A, h_A (cm)	Thickness of soil stratum B, (Enter value or 0) h_B (cm)	Thickness of soil stratum C, (Enter value or 0) h_C (cm)	Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	User-defined stratum A soil vapor permeability, k_v (cm^2)
15	152.4	14	152.4			SIC		

Stratum A SCS soil type (Lookup Soil Parameters)	Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	Stratum A soil total porosity, n^A (unitless)	Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	Stratum B SCS soil type (Lookup Soil Parameters)	Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	Stratum B soil total porosity, n^B (unitless)	Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	Stratum C SCS soil type (Lookup Soil Parameters)	Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	Stratum C soil total porosity, n^C (unitless)	Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SIC	1.38	0.481	0.216								

Enclosed space floor thickness, L_{crack} (cm)	Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	Enclosed space floor length, L_B (cm)	Enclosed space floor width, W_B (cm)	Enclosed space height, H_B (cm)	Floor-wall seam crack width, w (cm)	Indoor air exchange rate, ER (1/h)		Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	366	0.1	0.5		

Averaging time for carcinogens, AT_C (yrs)	Averaging time for noncarcinogens, AT_{NC} (yrs)	Exposure duration, ED (yrs)	Exposure frequency, EF (days/yr)
70	6	6	350

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1.89E+08	137.4	0.265			0.284	1.49E-09	0.844	1.26E-09	4,000	5.08E+04

Table E-39
INTERMEDIATE CALCULATIONS SHEET
Hypothetical Future Child Resident Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
95636	1,2,4-Trimethylbenzene	11,642	2.89E-03	1.23E-01	1.77E-04	3.15E-03	3.15E-03	1.10E+02	0.10	1.26E+00	3.15E-03	4.00E+02	2.18E+04	2.35E-05	2.59E-03
108678	1,3,5-Trimethylbenzene	11,626	2.77E-03	1.17E-01	1.77E-04	3.13E-03	3.13E-03	9.40E+01	0.10	1.26E+00	3.13E-03	4.00E+02	2.32E+04	2.35E-05	2.21E-03
106990	1,3-Butadiene	5,137	5.27E-02	2.24E+00	1.77E-04	1.29E-02	1.29E-02	3.60E+01	0.10	1.26E+00	1.29E-02	4.00E+02	1.14E+01	2.67E-05	9.63E-04
106467	1,4-Dichlorobenzene	11,202	1.16E-03	4.92E-02	1.77E-04	3.58E-03	3.58E-03	3.20E+00	0.10	1.26E+00	3.58E-03	4.00E+02	6.41E+03	2.37E-05	7.57E-05
71432	Benzene	8,081	3.28E-03	1.39E-01	1.77E-04	4.57E-03	4.57E-03	2.30E+01	0.10	1.26E+00	4.57E-03	4.00E+02	9.72E+02	2.39E-05	5.50E-04
100414	Ethylbenzene	10,110	4.09E-03	1.74E-01	1.77E-04	3.89E-03	3.89E-03	5.94E+00	0.10	1.26E+00	3.89E-03	4.00E+02	3.20E+03	2.37E-05	1.41E-04
67630	Isopropanol	10,014	4.13E-06	1.75E-04	1.77E-04	7.10E-03	7.10E-03	9.85E+00	0.10	1.26E+00	7.10E-03	4.00E+02	8.35E+01	2.45E-05	2.41E-04
622968	4-Ethyltoluene	9,445	2.47E-03	1.05E-01	1.77E-04	3.78E-03	3.78E-03	4.26E+01	0.10	1.26E+00	3.78E-03	4.00E+02	4.08E+03	2.37E-05	1.01E-03
142825	Heptane	8,101	1.01E+00	4.28E+01	1.77E-04	3.37E-03	3.37E-03	4.09E+01	0.10	1.26E+00	3.37E-03	4.00E+02	1.13E+04	2.36E-05	9.65E-04
540841	2,2,4-Trimethylpentane	7,787	4.09E-01	1.74E+01	1.77E-04	2.98E-03	2.98E-03	1.80E+02	0.10	1.26E+00	2.98E-03	4.00E+02	3.82E+04	2.34E-05	4.22E-03
591786	2-Hexanone	10,456	4.73E-05	2.01E-03	1.77E-04	4.15E-03	4.15E-03	1.50E+01	0.10	1.26E+00	4.15E-03	4.00E+02	1.93E+03	2.38E-05	3.57E-04
64175	Ethanol	10,495	2.36E-06	1.00E-04	1.77E-04	8.94E-03	8.94E-03	7.70E+01	0.10	1.26E+00	8.94E-03	4.00E+02	3.36E+01	2.50E-05	1.93E-03
109999	Tetrahydrofuran	7,701	1.47E-04	6.24E-03	1.77E-04	4.68E-03	4.68E-03	1.50E+01	0.10	1.26E+00	4.68E-03	4.00E+02	8.21E+02	2.39E-05	3.59E-04

Table E-40
RESULTS SHEET
Hypothetical Future Child Resident Exposure to Soil Gas
Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

CAS Number	Constituent	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	1,2,4-Trimethylbenzene	NA	3.5E-04
108678	1,3,5-Trimethylbenzene	NA	3.5E-04
106990	1,3-Butadiene	2.4E-09	4.6E-04
106467	1,4-Dichlorobenzene	6.8E-11	9.1E-08
71432	Benzene	3.5E-10	1.8E-05
100414	Ethylbenzene	2.9E-11	1.4E-07
67630	Isopropanol	NA	3.3E-08
622968	4-Ethyltoluene	NA	NA
142825	Heptane	NA	NA
540841	2,2,4-Trimethylpentane	NA	NA
591786	2-Hexanone	NA	NA
64175	Ethanol	NA	NA
109999	Tetrahydrofuran	NA	NA
	Total	**3E-09**	**0.001**

Appendix F

Analytical Results

Table F-1. Summary of Laboratory Analytical Results for Soil Gas at Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Units	1034SG001 05/08/08	1034SG002 05/08/08	1034SG004 05/08/08	1034SG006 05/08/08	1034SG007 05/08/08	1034SG008 05/08/08	1034SLB00A 05/08/08	1034SLB00B 05/08/08
Volatile Organics									
1,1,1-Trichloroethane	ug/m3	<7.2	<7.3	4.0 J	<7.0	<7.0	<29	1.6 J	<5.3
1,1,2,2-Tetrachloroethane	ug/m3	<9.1	<9.2	<9.1	<8.8	<8.8	<36	<6.3	<6.7
1,1,2-trichloro-1,2,2-trifluoroethane	ug/m3	<10	<10	<10	<9.9	<9.9	<41	<7.0	<7.5
1,1,2-Trichloroethane	ug/m3	<7.2	<7.3	<7.2	<7.0	<7.0	<29	<5.0	<5.3
1,1-Dichloroethane	ug/m3	<5.3	<5.4	<5.3	<5.2	<5.2	<21	<3.7	<4.0
1,1-Dichloroethene	ug/m3	<5.2	<5.3	<5.2	<5.1	<5.1	<21	<3.6	<3.9
1,2,4-Trichlorobenzene	ug/m3	<39	<40	<39	<38	<38	<160	<27	<29
1,2,4-Trimethylbenzene	ug/m3	17	<6.6	0.95 J	2.1 J	3.4 J	<26	<4.5	<4.8
1,2-Dibromoethane	ug/m3	<10	<10	<10	<9.9	<9.9	<41	<7.0	<7.5
1,2-Dichlorobenzene	ug/m3	<7.9	<8.1	<7.9	<7.8	<7.8	<32	<5.5	<5.9
1,2-Dichloroethane	ug/m3	<5.3	<5.4	<5.3	<5.2	<5.2	<21	<3.7	<4.0
1,2-Dichloropropane	ug/m3	<6.1	<6.2	<6.1	<6.0	<6.0	<24	<4.2	<4.5
1,3,5-Trimethylbenzene	ug/m3	14	<6.6	<6.5	<6.3	2.9 J	<26	<4.5	<4.8
1,3-Butadiene	ug/m3	4.8	8.8	16	17	5.6	31	<2.0	<2.2
1,3-Dichlorobenzene	ug/m3	<7.9	<8.1	<7.9	<7.8	<7.8	<32	<5.5	<5.9
1,4-Dichlorobenzene	ug/m3	<7.9	<8.1	<7.9	<7.8	<7.8	<32	<5.5	<5.9
1,4-Dioxane	ug/m3	<19	<19	<19	<18	<18	<76	<13	<14
2,2,4-Trimethylpentane	ug/m3	<6.2	<6.3	<6.2	<6.0	<6.0	<25	<4.3	<4.6
2-Butanone	ug/m3	92	16	11	28	14	25	3.8	1.6 J
2-Hexanone	ug/m3	15 J	2.2 J	1.4 J	2.7 J	2.9 J	<87	1.0 J	<16
2-Propanol	ug/m3	5.9 J	<13	<13	3.3 J	5.6 J	<52	1.3 J	<9.6
3-Chloropropene	ug/m3	<16	<17	<16	<16	<16	<66	<11	<12
4-Ethyltoluene	ug/m3	11	<6.6	<6.5	1.8 J	1.9 J	<26	<4.5	<4.8
4-Methyl-2-pentanone	ug/m3	7.5	1.4 J	0.86 J	1.8 J	1.4 J	<22	<3.7	<4.0
Acetone	ug/m3	620	97	52	280	68	120	16	7.9 J
Benzene	ug/m3	4.3	5.1	7.9	18	2.8 J	15 J	0.67 J	0.75 J
Benzyl Chloride	ug/m3	<6.8	<7.0	<6.8	<6.7	<6.7	<27	<4.7	<5.1
Bromodichloromethane	ug/m3	<8.8	21	<8.8	<8.6	<8.6	58	52	39
Bromoform	ug/m3	<14	<14	<14	<13	<13	<55	<9.4	<10
Bromomethane	ug/m3	<5.1	<5.2	<5.1	5.7	<5.0	<20	<3.6	<3.8
Carbon Disulfide	ug/m3	2.6 J	8	10	16	30	25	0.45 J	0.71 J
Carbon Tetrachloride	ug/m3	<8.3	<8.5	<8.3	<8.1	<8.1	9.4 J	<5.8	<6.2
Chlorobenzene	ug/m3	<6.1	<6.2	<6.1	<5.9	<5.9	<24	<4.2	<4.5
Chloroethane	ug/m3	<3.5	<3.5	<3.5	<3.4	<3.4	<14	<2.4	<2.6
Chloroform	ug/m3	2.3 J	400	190	<6.3	54	8,800	940	650
Chloromethane	ug/m3	2.6 J	<11	<11	6.3 J	<11	<44	<7.6	<8.1
cis-1,2-Dichloroethene	ug/m3	<5.2	<5.3	<5.2	<5.1	<5.1	<21	<3.6	<3.9
cis-1,3-Dichloropropene	ug/m3	<6.0	<6.1	<6.0	<5.8	<5.8	<24	<4.2	<4.4
Cyclohexane	ug/m3	6	2.0 J	<4.5	3.0 J	4.2 J	8.9 J	<3.1	<3.4
Dibromochloromethane	ug/m3	<11	<11	<11	<11	<11	<45	1.9 J	2.5 J
Dichlorodifluoromethane	ug/m3	<6.5	<6.6	<6.5	<6.4	<6.4	<26	5.3	7.8
Ethanol	ug/m3	36	23	6.4 J	14	3.8 J	7.0 J	2.7 J	<7.4

Table F-1. Summary of Laboratory Analytical Results for Soil Gas at Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Units	1034SG001 05/08/08	1034SG002 05/08/08	1034SG004 05/08/08	1034SG006 05/08/08	1034SG007 05/08/08	1034SG008 05/08/08	1034SLB00A 05/08/08	1034SLB00B 05/08/08
Ethylbenzene	ug/m3	2.4 J	2.6 J	1.3 J	2.9 J	<5.6	<23	<4.0	<4.2
Freon 114	ug/m3	<9.2	<9.4	<9.2	<9.0	<9.0	<37	<6.4	<6.8
Heptane	ug/m3	14	3.5 J	4.1 J	26	4.2 J	11 J	<3.7	<4.0
Hexachlorobutadiene	ug/m3	<56	<57	<56	<55	<55	<230	<39	<42
Hexane	ug/m3	9	6.8	<4.6	34	<4.5	16 J	<3.2	1.7 J
Isopropylbenzene	ug/m3	<6.5	<6.6	<6.5	<6.3	0.78 J	<26	<4.5	<4.8
m,p-Xylene	ug/m3	8.2	3.7 J	1.8 J	8	2.0 J	9.1 J	1.1 J	<4.2
Methyl tert-butyl ether	ug/m3	<4.8	<4.8	<4.8	<4.6	<4.6	<19	<3.3	<3.5
Methylene Chloride	ug/m3	<4.6	1.8 J	<4.6	1.4 J	<4.5	21	2.1 J	5
n-Propylbenzene	ug/m3	<6.5	<6.6	<6.5	1.7 J	<6.3	<26	<4.5	<4.8
o-Xylene	ug/m3	2.6 J	2.1 J	1.3 J	2.8 J	2.3 J	4.6 J	<4.0	<4.2
Styrene	ug/m3	1.3 J	<5.7	1.2 J	3.1 J	<5.5	3.7 J	<3.9	<4.2
Tetrachloroethene	ug/m3	<9.0	<9.1	3.3 J	<8.8	4.8 J	<36	1.9 J	1.7 J
Tetrahydrofuran	ug/m3	3.6 J	3.4 J	<3.9	3.2 J	<3.8	12 J	<2.7	<2.9
Toluene	ug/m3	3.9 J	8.3	7.7	11	2.8 J	16 J	2.5 J	1.3 J
trans-1,2-Dichloroethene	ug/m3	<5.2	<5.3	<5.2	<5.1	<5.1	<21	<3.6	<3.9
trans-1,3-Dichloropropene	ug/m3	<6.0	<6.1	<6.0	<5.8	<5.8	<24	<4.2	<4.4
Trichloroethene	ug/m3	3.0 J	5.2 J	1.2 J	22	13	17 J	17	9.9
Trichlorofluoromethane	ug/m3	2.2 J	3.4 J	3.1 J	3.3 J	2.6 J	<30	1.7 J	2.0 J
Vinyl Chloride	ug/m3	<3.4	<3.4	<3.4	<3.3	<3.3	<14	<2.3	<2.5
Xylenes (total)	ug/m3	11 J	5.8 J	3.1 J	11 J	4.3 J	14 J	1.1 J	<4.2

Table F-2. Summary of Laboratory Analytical Results for Soil at Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1034SB001 0.5 - 1.5 05/08/08	1034SB001 7 - 8 05/08/08	1034SB004 0.5 - 1.5 05/08/08	1034SB004 5 - 6 05/08/08	1034SB006 0.5 - 1.5 05/09/08	1034SB006 7 - 8 05/09/08	1034SB007 0.5 - 1.5 05/09/08	1034SB007 7 - 8 05/09/08	1034SB008 0.5 - 1.5 05/08/08	1034SB008 4 - 5 05/08/08
Volatile Organics											
1,1,1-Trichloroethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,1,2,2-Tetrachloroethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,1,2-trichloro-1,2,2-trifluoroethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,1,2-Trichloroethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,1-Dichloroethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,1-Dichloroethene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,2,3-Trichlorobenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,2,4-Trichlorobenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,2-Dibromo-3-chloropropane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,2-Dibromoethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,2-Dichlorobenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,2-Dichloroethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,2-Dichloropropane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,3-Dichlorobenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,4-Dichlorobenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
1,4-Dioxane	mg/kg	<0.056 J	<0.061 J	<0.086 J	<0.082 J	<0.067 [<0.062]	<0.078 J	<0.058	<0.059 J	<0.064 J	<0.052 J
2-Butanone	mg/kg	<0.011	<0.012	<0.017	<0.016	<0.013 [<0.012]	<0.016	<0.012	<0.012	<0.013	<0.010
2-Hexanone	mg/kg	<0.011	<0.012	<0.017	<0.016	<0.013 [<0.012]	<0.016	<0.012	<0.012	<0.013	<0.010
4-Methyl-2-pentanone	mg/kg	<0.011	<0.012	<0.017	<0.016	<0.013 [<0.012]	<0.016	<0.012	<0.012	<0.013	<0.010
Acetone	mg/kg	<0.011	<0.012	<0.017	<0.016	0.065 J [0.056 J]	<0.016	<0.012	<0.012	<0.013	<0.010
Benzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Bromochloromethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Bromodichloromethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Bromoform	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Bromomethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Carbon Disulfide	mg/kg	0.00032 J	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Carbon Tetrachloride	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Chlorobenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Chloroethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Chloroform	mg/kg	<0.0056	0.0058 J	<0.0086	0.00084 J	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	0.0042 J
Chloromethane	mg/kg	<0.0056	<0.00061 B	<0.0086	<0.0082	0.00071 J [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
cis-1,2-Dichloroethene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
cis-1,3-Dichloropropene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Cyclohexane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Dibromochloromethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Dichlorodifluoromethane	mg/kg	<0.0056	<0.0061	0.0044 J	0.0096	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	0.014	0.017
Ethylbenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Isopropylbenzene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Methyl acetate	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Methyl tert-butyl ether	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Methylcylohexane	mg/kg	0.00090 J	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Methylene Chloride	mg/kg	<0.012 B	<0.011 B	<0.014 B	<0.013 B	<0.011 B [<0.0077 B]	<0.017 B	<0.0078 B	<0.018 B	<0.011 B	<0.0064 B
Styrene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Tetrachloroethene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Toluene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
trans-1,2-Dichloroethene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052

Table F-2. Summary of Laboratory Analytical Results for Soil at Building 1034
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1034SB001 0.5 - 1.5 05/08/08	1034SB001 7 - 8 05/08/08	1034SB004 0.5 - 1.5 05/08/08	1034SB004 5 - 6 05/08/08	1034SB006 0.5 - 1.5 05/09/08	1034SB006 7 - 8 05/09/08	1034SB007 0.5 - 1.5 05/09/08	1034SB007 7 - 8 05/09/08	1034SB008 0.5 - 1.5 05/08/08	1034SB008 4 - 5 05/08/08
trans-1,3-Dichloropropene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Trichloroethene	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Trichlorofluoromethane	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Vinyl Chloride	mg/kg	<0.0056	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Xylenes (total)	mg/kg	0.0012 J	<0.0061	<0.0086	<0.0082	<0.0067 [<0.0062]	<0.0078	<0.0058	<0.0059	<0.0064	<0.0052
Semivolatile Organics											
1,1'-Biphenyl	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
1,2,4,5-Tetrachlorobenzene	mg/kg	<0.42 J	<0.45	<0.58 J	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0 J	<0.39
2,4,5-Trichlorophenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2,4,6-Trichlorophenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2,4-Dichlorophenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2,4-Dimethylphenol	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 [<1.7]	<1.6	<1.6	<1.5	<16	<1.6
2,4-Dinitrophenol	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 [<1.7]	<1.6	<1.6	<1.5	<16	<1.6
2,4-Dinitrotoluene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2,6-Dinitrotoluene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2-Chloronaphthalene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2-Chlorophenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2-Methylnaphthalene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2-Methylphenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
2-Nitroaniline	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 [<1.7]	<1.6	<1.6	<1.5	<16	<1.6
2-Nitrophenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
3,3'-Dichlorobenzidine	mg/kg	<0.42 J	<0.45 J	<0.58 J	<0.52 J	<0.42 J [<0.43 J]	<0.41 J	<0.41 J	<0.37 J	<4.0 J	<0.39 J
3-Nitroaniline	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 J [<1.7 J]	<1.6	<1.6 J	<1.5	<16	<1.6
4,6-Dinitro-2-methylphenol	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 [<1.7]	<1.6	<1.6	<1.5	<16	<1.6
4-Bromophenyl-phenylether	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
4-Chloro-3-Methylphenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
4-Chloroaniline	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 J [<0.43 J]	<0.41	<0.41 J	<0.37	<4.0	<0.39
4-Chlorophenyl-phenylether	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
4-Methylphenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
4-Nitroaniline	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 [<1.7]	<1.6	<1.6	<1.5	<16	<1.6
4-Nitrophenol	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 J [<1.7 J]	<1.6	<1.6 J	<1.5	<16	<1.6
Acenaphthene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.049
Acenaphthylene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	0.40 J	0.64
Acetophenone	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Anthracene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.30
Atrazine	mg/kg	<0.42 J	<0.45	<0.58 J	<0.52	<0.42 J [<0.43 J]	<0.41	<0.41 J	<0.37	<4.0 J	<0.39
Benzaldehyde	mg/kg	<0.42 J	R	<0.58 J	R	<0.42 J [<0.43 J]	R	<0.41 J	R	<4.0 J	R
Benzo(a)anthracene	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	1.8	2.6
Benzo(a)pyrene	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	3.0	4.0
Benzo(b)fluoranthene	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	0.052 J	<0.15	2.7	4.0 J
Benzo(g,h,i)perylene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	2.1 J	3.1
Benzo(k)fluoranthene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	2.4 J	2.6
bis(2-Chloroethoxy)methane	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
bis(2-Chloroethyl)ether	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
bis(2-Chloroisopropyl)ether	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
bis(2-Ethylhexyl)phthalate	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Butylbenzylphthalate	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39

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Location ID: Sample Depth(Feet): Date Collected:	Units	1034SB001 0.5 - 1.5 05/08/08	1034SB001 7 - 8 05/08/08	1034SB004 0.5 - 1.5 05/08/08	1034SB004 5 - 6 05/08/08	1034SB006 0.5 - 1.5 05/09/08	1034SB006 7 - 8 05/09/08	1034SB007 0.5 - 1.5 05/09/08	1034SB007 7 - 8 05/09/08	1034SB008 0.5 - 1.5 05/08/08	1034SB008 4 - 5 05/08/08
Caprolactam	mg/kg	0.19 J	<0.45	0.19 J	<0.52	0.20 J [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Carbazole	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 J [<0.43 J]	<0.41	<0.41 J	<0.37	<4.0	<0.39
Chrysene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	2.3 J	3.0
Dibenzo(a,h)anthracene	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	2.2	1.2
Dibenzofuran	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.033
Diethylphthalate	mg/kg	<0.42	<0.45	<0.58	0.067	<0.42 [<0.43]	0.094	<0.41	0.054	<4.0	<0.39
Dimethylphthalate	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Di-n-Butylphthalate	mg/kg	0.055 J	<0.45	0.056 J	<0.52	<0.042 B [<0.040 B]	<0.41	<0.047 B	<0.37	<4.0	<0.39
Dinitrotoluene Mix	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Di-n-Octylphthalate	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Fluoranthene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	3.3 J	4.7
Fluorene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.14
Hexachlorobenzene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Hexachlorobutadiene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Hexachlorocyclopentadiene	mg/kg	<0.42 J	<0.45 J	<0.58 J	<0.52 J	<0.42 J [<0.43 J]	<0.41 J	<0.41 J	<0.37 J	<4.0 J	<0.39 J
Hexachloroethane	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Indeno(1,2,3-cd)pyrene	mg/kg	<0.17	<0.18	<0.23	<0.21	<0.17 [<0.17]	<0.16	<0.16	<0.15	2.8	2.3
Isophorone	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Naphthalene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	0.046
Nitrobenzene	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
N-Nitroso-di-n-propylamine	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
N-Nitrosodiphenylamine	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Pentachlorophenol	mg/kg	<1.7	<1.8	<2.3	<2.1	<1.7 [<1.7]	<1.6	<1.6	<1.5	<16	<1.6
Phenol	mg/kg	<0.42	<0.45	<0.58	<0.52	<0.42 [<0.43]	<0.41	<0.41	<0.37	<4.0	<0.39
Pyrene	mg/kg	<0.42	<0.45 J	<0.58	<0.52 J	<0.42 [<0.43]	<0.41 J	<0.41	<0.37 J	3.9 J	5.3 J
Explosives											
1,3,5-Trinitrobenzene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
1,3-Dinitrobenzene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2,4,6-Trinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2,4-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2-Amino-4,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
4-Amino-2,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Dinitrotoluene Mix	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
HMX	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
m-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Nitrobenzene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Nitroglycerine	mg/kg	<5	<5	<5	<5	<5 [<5]	<5	<5	<5	<5	<5
o-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Pentaerythritol Tetranitrate	mg/kg	<5	<5	<5	<5	<5 [<5]	<5	<5	<5	<5	<5
p-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
RDX	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Tetryl	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25

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PCBs											
Aroclor-1016	mg/kg	<0.021	<0.022	<0.029	<0.026	<0.020 [<0.021]	<0.020	<0.021	<0.018	<0.020	<0.019
Aroclor-1221	mg/kg	<0.021	<0.022	<0.029	<0.026	<0.020 [<0.021]	<0.020	<0.021	<0.018	<0.020	<0.019
Aroclor-1232	mg/kg	<0.021	<0.022	<0.029	<0.026	<0.020 [<0.021]	<0.020	<0.021	<0.018	<0.020	<0.019
Aroclor-1242	mg/kg	<0.021	<0.022	<0.029	<0.026	<0.020 [<0.021]	<0.020	<0.021	<0.018	<0.020	<0.019
Aroclor-1248	mg/kg	<0.021	<0.022	<0.029	<0.026	<0.020 [<0.021]	<0.020	<0.021	<0.018	<0.020	<0.019
Aroclor-1254	mg/kg	<0.021	<0.022	<0.029	<0.026	<0.020 [<0.021]	<0.020	0.048	<0.018	<0.020	<0.019
Aroclor-1260	mg/kg	0.064	<0.022	<0.029	<0.026	<0.020 [<0.050 B]	<0.020	<0.0089 B	<0.018	0.012 J	0.024
Inorganics											
Aluminum	mg/kg	33,300	41,000	61,700	34,000	44,300 [32,200]	14,600	29,000	12,600	29,700	12,800
Antimony	mg/kg	<3.80 J	<3.80 J	<5.30 J	<4.70 J	<3.80 [<3.90]	<3.60 J	<3.70 J	<3.30 J	<3.60 J	<3.30 J
Arsenic	mg/kg	3.40	1.90	10.1	4.40	4.10 [4.90]	3.80	1.60	4.30	4.00	11.7
Barium	mg/kg	59.4	74.7	91.4	47.7	43.9 [66.1]	25.8	73.3	48.7	75.1	174
Beryllium	mg/kg	0.770 J	1.10	1.60 J	2.30	0.620 [0.740]	0.670	1.10	0.710	0.930 J	1.00
Cadmium	mg/kg	<1.30	0.310	<1.80	0.690	<1.30 J [0.320 J]	<1.20	<1.20	<1.10	<1.20	0.300
Calcium	mg/kg	2,440 J	764	2,820 J	546	541 J [1,360 J]	<1,190	2,070 J	<1,090	6,100 J	771
Chromium	mg/kg	37.7	47.4	46.4	25.1	37.5 [39.6]	45.0	59.1	30.1	36.2	13.7
Cobalt	mg/kg	8.20	8.00	10.2	34.5	3.90 [6.20]	5.50	11.0	10.4	11.6	10.8
Copper	mg/kg	20.1	28.8	79.0	29.7	11.7 J [39.9 J]	10.4	27.6	6.30	22.2	13.6
Iron	mg/kg	46,800	47,600	76,800	49,500	50,200 [42,700]	25,300	90,500	23,500	48,100	49,300
Lead	mg/kg	14.3	20.7	60.8	102	15.2 [21.7]	8.10	29.2	4.50	15.7	4.60
Magnesium	mg/kg	2,100 J	2,530	2,750 J	9,880	1,040 [1,290]	525	1,410	467	4,300 J	768
Manganese	mg/kg	214 J	164 J	108 J	979 J	59.4 J [276 J]	92.4 J	1,130	356 J	329 J	1,090 J
Mercury	mg/kg	0.0450 J	0.0170 J	0.490 J	<0.0510 J	0.250 [0.140]	<0.0420 J	0.130	<0.0370 J	0.350 J	0.250 J
Nickel	mg/kg	13.5	19.9	26.1	30.3	11.1 [10.0]	9.80	11.7	10.1	15.4	10.5
Potassium	mg/kg	1,270	2,210	1,950	6,270	922 [955]	598	1,010	549	1,670	735
Selenium	mg/kg	<1.30	<1.30	<1.80	<1.60	<1.30 [<1.30]	<1.20	<1.20	<1.10	<1.20	<1.10
Silver	mg/kg	<2.50	<2.60	<3.50	<3.10	<2.50 [<2.60]	<2.40	<2.50	<2.20	<2.40	<2.20
Sodium	mg/kg	<1,270	<1,280	<1,750	<1,570	<1,260 [<1,290]	<1,190	<1,240	<1,090	<1,200	<1,090
Thallium	mg/kg	<2.50	<2.60	<3.50	<3.10	<2.50 [<2.60]	<2.40	<2.50	<2.20	<2.40	<2.20
Vanadium	mg/kg	73.9	101	133	76.0	81.7 [77.4]	39.5	89.1	27.2	76.8	37.1
Zinc	mg/kg	36.6	56.3	149	182	25.0 J [82.7 J]	27.0	53.9	18.0	47.2	26.6

Table F-3. Summary of Laboratory Analytical Results for Soil Gas at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Units	1041SG001 05/08/08	1041SG002 05/08/08	1041SG003 05/08/08	1041SG004 05/08/08	1041SLB00A 05/06/08
Volatile Organics						
1,1,1-Trichloroethane	ug/m3	3.5 J	5.9 J	480	<7.5	6.8
1,1,2,2-Tetrachloroethane	ug/m3	<8.7	<8.8	<24	<9.5	<6.1
1,1,2-trichloro-1,2,2-trifluoroethane	ug/m3	<9.7	<9.9	<26	<10	<6.8
1,1,2-Trichloroethane	ug/m3	<6.9	<7.0	<19	<7.5	<4.9
1,1-Dichloroethane	ug/m3	<5.1	<5.2	<14	<5.6	<3.6
1,1-Dichloroethene	ug/m3	<5.0	<5.1	52	<5.5	<3.5
1,2,4-Trichlorobenzene	ug/m3	<38	<38	<100	<41	<26
1,2,4-Trimethylbenzene	ug/m3	<6.2	<6.3	<17	<6.8	<4.4
1,2-Dibromoethane	ug/m3	<9.7	<9.9	<26	<11	<6.9
1,2-Dichlorobenzene	ug/m3	<7.6	<7.8	<21	<8.3	<5.4
1,2-Dichloroethane	ug/m3	<5.1	<5.2	<14	<5.6	<3.6
1,2-Dichloropropane	ug/m3	<5.8	<6.0	<16	<6.4	<4.1
1,3,5-Trimethylbenzene	ug/m3	<6.2	<6.3	<17	<6.8	<4.4
1,3-Butadiene	ug/m3	29	20	24	37	<2.0
1,3-Dichlorobenzene	ug/m3	<7.6	<7.8	<21	<8.3	<5.4
1,4-Dichlorobenzene	ug/m3	<7.6	<7.8	<21	<8.3	<5.4
1,4-Dioxane	ug/m3	<18	<18	<50	<20	<13
2,2,4-Trimethylpentane	ug/m3	<5.9	<6.0	<16	<6.4	<4.2
2-Butanone	ug/m3	20	11	11	21	1.5 J
2-Hexanone	ug/m3	<21	1.5 J	<56	2.1 J	<15
2-Propanol	ug/m3	<12	0.99 J	<34	<14	0.96 J
3-Chloropropene	ug/m3	<16	<16	<43	<17	<11
4-Ethyltoluene	ug/m3	<6.2	<6.3	<17	1.6 J	<4.4
4-Methyl-2-pentanone	ug/m3	1.3 J	1.3 J	<14	<5.6	<3.7
Acetone	ug/m3	190	59	97	100	9.8
Benzene	ug/m3	15	5.6	8.6 J	21	<2.8
Benzyl Chloride	ug/m3	<6.5	<6.7	<18	<7.1	<4.6
Bromodichloromethane	ug/m3	<8.5	<8.6	<23	<9.2	<6.0
Bromoform	ug/m3	<13	<13	<36	<14	<9.2
Bromomethane	ug/m3	3.9 J	<5.0	<13	<5.4	<3.5
Carbon Disulfide	ug/m3	20	4.6	9.4 J	25	1.3 J
Carbon Tetrachloride	ug/m3	<8.0	<8.1	<22	<8.7	<5.6
Chlorobenzene	ug/m3	<5.8	<5.9	<16	<6.4	<4.1
Chloroethane	ug/m3	<3.3	<3.4	<9.1	<3.6	<2.4
Chloroform	ug/m3	10	370	6.7 J	2.7 J	170
Chloromethane	ug/m3	<10	<11	<28	2.2 J	<7.4
cis-1,2-Dichloroethene	ug/m3	<5.0	<5.1	<14	<5.5	<3.5
cis-1,3-Dichloropropene	ug/m3	<5.7	<5.8	<16	<6.3	<4.1
Cyclohexane	ug/m3	1.5 J	2.7 J	<12	3.0 J	<3.1
Dibromochloromethane	ug/m3	<11	<11	<29	<12	<7.6
Dichlorodifluoromethane	ug/m3	2.4 J	3.5 J	<17	<6.8	3.3 J
Ethanol	ug/m3	23	4.6 J	8.4 J	11	1.4 J

Table F-3. Summary of Laboratory Analytical Results for Soil Gas at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Units	1041SG001 05/08/08	1041SG002 05/08/08	1041SG003 05/08/08	1041SG004 05/08/08	1041SLB00A 05/06/08
Ethylbenzene	ug/m3	2.2 J	<5.6	<15	3.7 J	<3.9
Freon 114	ug/m3	<8.8	<9.0	<24	<9.6	<6.2
Heptane	ug/m3	9.7	5.8	48	15	<3.7
Hexachlorobutadiene	ug/m3	<54	<55	<150	<59	<38
Hexane	ug/m3	13	7.6	57	22	<3.2
Isopropylbenzene	ug/m3	<6.2	<6.3	<17	<6.8	<4.4
m,p-Xylene	ug/m3	2.4 J	<5.6	1.9 J	4.6 J	<3.9
Methyl tert-butyl ether	ug/m3	<4.6	<4.6	<12	<5.0	<3.2
Methylene Chloride	ug/m3	<4.4	<4.5	4.2 J	<4.8	1.3 J
n-Propylbenzene	ug/m3	<6.2	<6.3	<17	<6.8	<4.4
o-Xylene	ug/m3	1.5 J	0.98 J	3.4 J	2.4 J	<3.9
Styrene	ug/m3	2.0 J	<5.5	<15	2.4 J	<3.8
Tetrachloroethene	ug/m3	<8.6	5.6 J	540	<9.4	3.2 J
Tetrahydrofuran	ug/m3	2.7 J	<3.8	7.1 J	2.9 J	<2.6
Toluene	ug/m3	13	5.4	7.4 J	19	1.8 J
trans-1,2-Dichloroethene	ug/m3	<5.0	<5.1	<14	<5.5	<3.5
trans-1,3-Dichloropropene	ug/m3	<5.7	<5.8	<16	<6.3	<4.1
Trichloroethene	ug/m3	5.4 J	18	3,300	<7.4	46
Trichlorofluoromethane	ug/m3	<7.1	3.4 J	<19	<7.8	1.3 J
Vinyl Chloride	ug/m3	<3.2	<3.3	<8.8	<3.5	<2.3
Xylenes (total)	ug/m3	3.9 J	0.98 J	5.3 J	7.0 J	<3.9

Table F-4. Summary of Laboratory Analytical Results for Soil at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID:		1041SB001	1041SB001	1041SB002	1041SB002	1041SB003	1041SB003	1041SB004	1041SB004	1041SB006	1041SB007	1041SB008	1041SB009	1041SB010	1041SB011	1041SB014	1041SB018	1041SB019
Sample Depth(Feet):		0.5 - 1.5	7 - 8	1 - 2	7 - 8	0.5 - 1.5	7 - 8	0 - 1	7 - 8	0.5 - 1	0.5 - 1	0.5 - 1	7 - 8	7 - 8	8 - 9	6 - 7	6 - 7	6 - 7
Date Collected:	Units	05/09/08	05/09/08	05/08/08	05/08/08	05/09/08	05/09/08	05/08/08	05/08/08	06/25/08	06/25/08	06/25/08	06/26/08	06/26/08	06/26/08	06/26/08	06/27/08	06/27/08
Volatile Organics																		
1,1,1-Trichloroethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,1,2,2-Tetrachloroethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,1,2-trichloro-1,2,2-trifluoroethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,1,2-Trichloroethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,1-Dichloroethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,1-Dichloroethene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,2,3-Trichlorobenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,2,4-Trichlorobenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,2-Dibromo-3-chloropropane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,2-Dibromoethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,2-Dichlorobenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,2-Dichloroethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,2-Dichloropropane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,3-Dichlorobenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,4-Dichlorobenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
1,4-Dioxane	mg/kg	<0.056	<0.080 J	<0.053 J	<0.054 J	<0.058	<0.077 J	<0.066 J	<0.078 J	NA	NA	NA	<0.069 J	<0.072 J	<0.070 J [<0.070 J]	<0.068 J	<0.083 J	<0.057 J
2-Butanone	mg/kg	<0.011	<0.016	<0.011	<0.011	<0.012	<0.015	<0.013	<0.016	NA	NA	NA	<0.014	<0.014	<0.014 [<0.014]	<0.014	<0.016	<0.011
2-Hexanone	mg/kg	<0.011	<0.016	<0.011	<0.011	<0.012	<0.015	<0.013	<0.016	NA	NA	NA	<0.014	<0.014	<0.014 [<0.014]	<0.014	<0.016	<0.011
4-Methyl-2-pentanone	mg/kg	<0.011	<0.016	<0.011	<0.011	<0.012	<0.015	<0.013	<0.016	NA	NA	NA	<0.014	<0.014	<0.014 [<0.014]	<0.014	<0.016	<0.011
Acetone	mg/kg	<0.011	<0.016	<0.011	<0.011	0.010 J	<0.015	<0.013	<0.016	NA	NA	NA	<0.014	<0.014	<0.014 [<0.014]	<0.014	<0.016	0.0034
Benzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Bromochloromethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Bromodichloromethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Bromoform	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Bromomethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Carbon Disulfide	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Carbon Tetrachloride	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Chlorobenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Chloroethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Chloroform	mg/kg	<0.0056	<0.0080	<0.0053	0.0063	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	0.0038 J	<0.0057
Chloromethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.00076 B	<0.0066	<0.00066 B	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
cis-1,2-Dichloroethene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
cis-1,3-Dichloropropene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Cyclohexane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Dibromochloromethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Dichlorodifluoromethane	mg/kg	<0.0056	<0.0080	0.0030 J	<0.0054	<0.0058	<0.0077	0.0083	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Ethylbenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Isopropylbenzene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Methyl acetate	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Methyl tert-butyl ether	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Methylcyclohexane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Methylene Chloride	mg/kg	<0.0069 B	<0.020 B	<0.0098 B	<0.0065 B	<0.0093 B	<0.016 B	<0.0061 B	<0.014 B	NA	NA	NA	0.012	0.011	0.015 [0.011]	0.0098	0.0065	0.0049
Styrene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Tetrachloroethene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Toluene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	0.00070 J	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
trans-1,2-Dichloroethene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
trans-1,3-Dichloropropene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Trichloroethene	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	0.0015 J	0.0011 J	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Trichlorofluoromethane	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Vinyl Chloride	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Xylenes (total)	mg/kg	<0.0056	<0.0080	<0.0053	<0.0054	<0.0058	<0.0077	<0.0066	<0.0078	NA	NA	NA	<0.0069	<0.0072	<0.0070 [<0.0070]	<0.0068	<0.0083	<0.0057
Semivolatile Organics																		
1,1'-Biphenyl	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table F-4. Summary of Laboratory Analytical Results for Soil at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1041SB001 0.5 - 1.5 05/09/08	1041SB001 7 - 8 05/09/08	1041SB002 1 - 2 05/08/08	1041SB002 7 - 8 05/08/08	1041SB003 0.5 - 1.5 05/09/08	1041SB003 7 - 8 05/09/08	1041SB004 0 - 1 05/08/08	1041SB004 7 - 8 05/08/08	1041SB006 0.5 - 1 06/25/08	1041SB007 0.5 - 1 06/25/08	1041SB008 0.5 - 1 06/25/08	1041SB009 7 - 8 06/26/08	1041SB010 7 - 8 06/26/08	1041SB011 8 - 9 06/26/08	1041SB014 6 - 7 06/26/08	1041SB018 6 - 7 06/27/08	1041SB019 6 - 7 06/27/08
1,2,4,5-Tetrachlorobenzene	mg/kg	<0.41	<0.50	<0.43 J	<0.43	<0.41	<0.49	<0.43 J	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/kg	<1.6	<2.0	<1.7	<1.7	<1.6	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	mg/kg	<1.6	<2.0	<1.7	<1.7	<1.6	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	mg/kg	<1.6	<2.0	<1.7	<1.7	<1.6	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	<0.41 J	<0.50 J	<0.43 J	<0.43 J	<0.41 J	<0.49 J	<0.43 J	<0.48 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	mg/kg	<1.6 J	<2.0	<1.7	<1.7	<1.6 J	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	<1.6	<2.0	<1.7	<1.7	<1.6	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-Methylphenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	mg/kg	<0.41 J	<0.50	<0.43	<0.43	<0.41 J	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	mg/kg	<1.6	<2.0	<1.7	<1.7	<1.6	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	mg/kg	<1.6 J	<2.0	<1.7	<1.7	<1.6 J	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	mg/kg	<0.41 J	<0.50	<0.43 J	<0.43	<0.41 J	<0.49	<0.43 J	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	mg/kg	<0.41 J	R	<0.43 J	R	<0.41 J	R	<0.43 J	R	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/kg	<0.16	<0.20	<0.17	<0.17	<0.16	<0.20	<0.17	<0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/kg	<0.16	<0.20	<0.17	<0.17	<0.16	<0.20	<0.17	<0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/kg	<0.16	<0.20	<0.17	<0.17	<0.16	<0.20	<0.17	<0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroisopropyl)ether	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	0.051 J	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	mg/kg	0.14 J	0.11	0.14 J	<0.43	<0.41	0.15	0.16 J	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	mg/kg	<0.41 J	<0.50	<0.43	<0.43	<0.41 J	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/kg	<0.16	<0.20	<0.17	<0.17	<0.16	<0.20	<0.17	<0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	0.12	0.045 J	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethylphthalate	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-Butylphthalate	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	0.077 J	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-Octylphthalate	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	<0.41 J	<0.50 J	<0.43 J	<0.43 J	<0.41 J	<0.49 J	<0.43 J	<0.48 J	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table F-4. Summary of Laboratory Analytical Results for Soil at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1041SB001 0.5 - 1.5 05/09/08	1041SB001 7 - 8 05/09/08	1041SB002 1 - 2 05/08/08	1041SB002 7 - 8 05/08/08	1041SB003 0.5 - 1.5 05/09/08	1041SB003 7 - 8 05/09/08	1041SB004 0 - 1 05/08/08	1041SB004 7 - 8 05/08/08	1041SB006 0.5 - 1 06/25/08	1041SB007 0.5 - 1 06/25/08	1041SB008 0.5 - 1 06/25/08	1041SB009 7 - 8 06/26/08	1041SB010 7 - 8 06/26/08	1041SB011 8 - 9 06/26/08	1041SB014 6 - 7 06/26/08	1041SB018 6 - 7 06/27/08	1041SB019 6 - 7 06/27/08
Hexachloroethane	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	<0.16	<0.20	<0.17	<0.17	<0.16	<0.20	<0.17	<0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	<1.6	<2.0	<1.7	<1.7	<1.6	<2.0	<1.7	<1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	<0.41	<0.50	<0.43	<0.43	<0.41	<0.49	<0.43	<0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/kg	<0.41	<0.50 J	<0.43	<0.43 J	<0.41	<0.49 J	<0.43	<0.48 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives																		
1,3,5-Trinitrobenzene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
m-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerine	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentaerythritol Tetranitrate	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs																		
Aroclor-1016	mg/kg	<0.021	<0.025	<0.022	<0.021	<0.020	<0.025	<0.022	<0.024	<0.020	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Aroclor-1221	mg/kg	<0.021	<0.025	<0.022	<0.021	<0.020	<0.025	<0.022	<0.024	<0.020	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Aroclor-1232	mg/kg	<0.021	<0.025	<0.022	<0.021	<0.020	<0.025	<0.022	<0.024	<0.020	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Aroclor-1242	mg/kg	<0.021	<0.025	<0.022	<0.021	<0.020	<0.025	<0.022	<0.024	<0.020	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Aroclor-1248	mg/kg	<0.021	<0.025	<0.022	<0.021	<0.020	<0.025	<0.022	<0.024	<0.020	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Aroclor-1254	mg/kg	<0.021	<0.025	0.033	<0.021	<0.020	<0.025	0.21	<0.024	<0.020	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Aroclor-1260	mg/kg	<0.021	<0.025	0.028	<0.021	<0.020	<0.025	0.092	<0.024	<0.020	<0.020	<0.020	NA	NA	NA	NA	NA	NA
Inorganics																		
Aluminum	mg/kg	26,300	31,800	28,300	23,900	13,200	22,000	25,300	29,200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	<3.70	<4.30 J	<3.90 J	<3.70 J	<3.70	<4.40 J	<3.90 J	<4.20 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	4.20	1.60	3.50	3.70	1.30	<2.90	4.10	1.90	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	137	146	60.1	73.3	32.3	35.5	87.8	76.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	1.30	2.30	0.740 J	0.830	0.410	1.50	0.820 J	2.50	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	<1.20	0.540	<1.30	0.370	<1.20	<1.50	0.270 J	0.490	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	7,110	994	6,490 J	5,080	16,600	645	1,420 J	653	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	mg/kg	30.4	29.4	29.0	27.2	15.5	16.8	28.1	38.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	37.3	25.5	9.90	12.4	6.50	8.00	9.80	13.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	14.6	5.00	20.2	13.4	5.00	4.00	20.4	9.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	35,700	60,500	37,700	36,900	14,000	41,600	42,700	60,900	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	19.1	2.00	13.3	10.2	6.20	1.90	34.9	2.50	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	4,830	8,030	3,450 J	3,890	9,670	1,470	1,480 J	7,190	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3,300	1,530 J	276 J	538 J	449	487 J	715 J	893 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.0770	<0.0510 J	0.130 J	0.0570 J	0.0350 J	<0.0480 J	0.270 J	<0.0410 J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	17.4	30.7	12.4	12.2	5.80	14.5	11.9	24.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	1,360	1,390	1,180	1,230	538	2,140	1,280	5,150	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table F-4. Summary of Laboratory Analytical Results for Soil at Building 1041
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1041SB001 0.5 - 1.5 05/09/08	1041SB001 7 - 8 05/09/08	1041SB002 1 - 2 05/08/08	1041SB002 7 - 8 05/08/08	1041SB003 0.5 - 1.5 05/09/08	1041SB003 7 - 8 05/09/08	1041SB004 0 - 1 05/08/08	1041SB004 7 - 8 05/08/08	1041SB006 0.5 - 1 06/25/08	1041SB007 0.5 - 1 06/25/08	1041SB008 0.5 - 1 06/25/08	1041SB009 7 - 8 06/26/08	1041SB010 7 - 8 06/26/08	1041SB011 8 - 9 06/26/08	1041SB014 6 - 7 06/26/08	1041SB018 6 - 7 06/27/08	1041SB019 6 - 7 06/27/08
Selenium	mg/kg	<1.20	<1.40	<1.30	<1.20	<1.20	<1.50	<1.30	<1.40	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	<2.50	<2.90	<2.60	<2.50	<2.50	<2.90	<2.60	<2.80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	<1,230	<1,430	<1,300	<1,240	<1,240	<1,460	<1,300	<1,410	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	<2.50	<2.90	<2.60	<2.50	<2.50	<2.90	<2.60	<2.80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	54.2	45.3	57.9	49.9	17.5	29.0	59.4	67.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	40.9	64.2	30.0	24.7	15.1	16.0	78.6	57.3	NA	NA	NA	NA	NA	NA	NA	NA	NA

Location ID: / Sample Depth: / Date Collected:	Units	1041HP001 05/09/08	1041HP001 06/29/08	1041HP002 05/08/08	1041HP003 05/09/08	1041HP004 05/09/08	1041HP015 06/27/08	1041HP016 17 - 28 06/27/08	1041HP017 22 - 25 06/27/08
Explosives									
1,3,5-Trinitrobenzene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
1,3-Dinitrobenzene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
2,4,6-Trinitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
2,4-Dinitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
2,6-Dinitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
2-Amino-4,6-Dinitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
4-Amino-2,6-Dinitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
Dinitrotoluene Mix	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
HMX	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
m-Nitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
Nitrobenzene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
Nitroglycerine	ug/L	4.4 U	NA	4.4 U	4.2 U	4 U	NA	NA	NA
o-Nitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
Pentaerythritol Tetranitrate	ug/L	4.4 U	NA	4.4 U	4.2 U	4 U	NA	NA	NA
p-Nitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
RDX	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
Tetryl	ug/L	0.22 U	NA	0.22 U	0.21 U	0.2 U	NA	NA	NA
PCBs									
Aroclor-1016	ug/L	0.50 U	0.50 U	0.53 U	0.48 U	0.48 U	NA	NA	NA
Aroclor-1221	ug/L	0.50 U	0.50 U	0.53 U	0.48 U	0.48 U	NA	NA	NA
Aroclor-1232	ug/L	0.50 U	0.50 U	0.53 U	0.48 U	0.48 U	NA	NA	NA
Aroclor-1242	ug/L	0.50 U	0.50 U	0.53 U	0.48 U	0.48 U	NA	NA	NA
Aroclor-1248	ug/L	0.50 U	0.50 U	0.53 U	0.48 U	0.48 U	NA	NA	NA
Aroclor-1254	ug/L	0.50 U	0.50 U	0.53 U	0.48 U	0.48 U	NA	NA	NA
Aroclor-1260	ug/L	1.8	0.50 U	0.53 U	0.48 U	0.48 U	NA	NA	NA
Volatile Organics									
1,1,1-Trichloroethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-trichloro-1,2,2-trifluoroethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-Trichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Location ID: / Sample Depth: / Date Collected:	Units	1041HP001 05/09/08	1041HP001 06/29/08	1041HP002 05/08/08	1041HP003 05/09/08	1041HP004 05/09/08	1041HP015 06/27/08	1041HP016 17 - 28 06/27/08	1041HP017 22 - 25 06/27/08
1,2-Dichloropropane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane	ug/L	5.0 U	NA	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ
2-Butanone	ug/L	10 U	NA	10 U	10 U	10 U	8.7 J	10 U	10 U
2-Hexanone	ug/L	5.0 U	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methyl-2-pentanone	ug/L	5.0 U	NA	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone	ug/L	3.8 J	NA	10 U	2.8 J	10 U	45	1.4	15
Benzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromochloromethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	ug/L	1.0 UJ	NA	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U
Carbon Disulfide	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	ug/L	35	NA	42	42	44	1.1	51	38
Chloromethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl tert-butyl ether	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylcylohexane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	ug/L	1.0 U	NA	0.31 UB	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Location ID:		1041HP001	1041HP001	1041HP002	1041HP003	1041HP004	1041HP015	1041HP016	1041HP017
Sample Depth:								17 - 28	22 - 25
Date Collected:	Units	05/09/08	06/29/08	05/08/08	05/09/08	05/09/08	06/27/08	06/27/08	06/27/08
Semivolatile Organics									
1,1'-Biphenyl	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2,4,5-Trichlorophenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2,4,6-Trichlorophenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2,4-Dichlorophenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2,4-Dimethylphenol	ug/L	20 U	NA	22 U	19 U	20 U	NA	NA	NA
2,4-Dinitrophenol	ug/L	50 U	NA	56 U	48 U	50 U	NA	NA	NA
2,4-Dinitrotoluene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2,6-Dinitrotoluene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2-Chloronaphthalene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2-Chlorophenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2-Methylnaphthalene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2-Methylphenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
2-Nitroaniline	ug/L	20 U	NA	22 U	19 U	20 U	NA	NA	NA
2-Nitrophenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
3,3'-Dichlorobenzidine	ug/L	5.0 UJ	NA	5.6 UJ	4.8 UJ	5.0 UJ	NA	NA	NA
3-Nitroaniline	ug/L	20 U	NA	22 U	19 U	20 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	ug/L	20 U	NA	22 U	19 U	20 U	NA	NA	NA
4-Bromophenyl-phenylether	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
4-Chloro-3-Methylphenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
4-Chloroaniline	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
4-Chlorophenyl-phenylether	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
4-Methylphenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
4-Nitroaniline	ug/L	20 U	NA	22 U	19 U	20 U	NA	NA	NA
4-Nitrophenol	ug/L	20 U	NA	22 U	19 U	20 U	NA	NA	NA
Acenaphthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Acenaphthylene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Acetophenone	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Anthracene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Atrazine	ug/L	5.0 UJ	NA	5.6 UJ	4.8 UJ	5.0 UJ	NA	NA	NA
Benzaldehyde	ug/L	5.0 UJ	NA	5.6 UJ	4.8 UJ	5.0 UJ	NA	NA	NA
Benzo(a)anthracene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Benzo(a)pyrene	ug/L	2.0 U	NA	2.2 U	1.9 U	2.0 U	NA	NA	NA
Benzo(b)fluoranthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Benzo(g,h,i)perylene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Benzo(k)fluoranthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
bis(2-Chloroethoxy)methane	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
bis(2-Chloroethyl)ether	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA

Location ID: Sample Depth: Date Collected:	Units	1041HP001 05/09/08	1041HP001 06/29/08	1041HP002 05/08/08	1041HP003 05/09/08	1041HP004 05/09/08	1041HP015 06/27/08	1041HP016 17 - 28 06/27/08	1041HP017 22 - 25 06/27/08
bis(2-Chloroisopropyl)ether	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
bis(2-Ethylhexyl)phthalate	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Butylbenzylphthalate	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Caprolactam	ug/L	2.8 UB	NA	1.7 UB	0.97 UB	1.5 UB	NA	NA	NA
Carbazole	ug/L	5.0 U	NA	5.6 UJ	4.8 U	5.0 U	NA	NA	NA
Chrysene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Dibenzo(a,h)anthracene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Dibenzofuran	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Diethylphthalate	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Dimethylphthalate	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Di-n-Butylphthalate	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Dinitrotoluene Mix	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Di-n-Octylphthalate	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Fluoranthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Fluorene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Hexachlorobenzene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Hexachlorobutadiene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Hexachlorocyclopentadiene	ug/L	5.0 UJ	NA	5.6 UJ	4.8 UJ	5.0 UJ	NA	NA	NA
Hexachloroethane	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/L	5.0 U	NA	5.6 UJ	4.8 U	5.0 U	NA	NA	NA
Isophorone	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Naphthalene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Nitrobenzene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
N-Nitroso-di-n-propylamine	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
N-Nitrosodiphenylamine	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Pentachlorophenol	ug/L	20 U	NA	22 U	19 U	20 U	NA	NA	NA
Phenol	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Pyrene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Inorganics									
Aluminum	ug/L	53,800	NA	2,120	32,000	12,000	NA	NA	NA
Antimony	ug/L	15.0 U	NA	3.80 U	15.0 U	15.0 U	NA	NA	NA
Arsenic	ug/L	16.8	NA	1.00 J	27.6	5.80 J	NA	NA	NA
Barium	ug/L	618	NA	36.6	226	80.3	NA	NA	NA
Beryllium	ug/L	4.90 J	NA	0.330 J	4.40 J	5.00 U	NA	NA	NA
Cadmium	ug/L	5.00 U	NA	1.20 U	5.00 U	5.00 U	NA	NA	NA
Calcium	ug/L	23,500	NA	17,500	18,800	27,000	NA	NA	NA
Chromium	ug/L	139	NA	4.70	144	38.4	NA	NA	NA
Cobalt	ug/L	55.0	NA	3.10 J	129	5.30 J	NA	NA	NA
Copper	ug/L	95.2	NA	10.8	222	25.0 U	NA	NA	NA

Location ID: / Sample Depth: / Date Collected:	Units	1041HP001 05/09/08	1041HP001 06/29/08	1041HP002 05/08/08	1041HP003 05/09/08	1041HP004 05/09/08	1041HP015 06/27/08	1041HP016 17 - 28 06/27/08	1041HP017 22 - 25 06/27/08
Iron	ug/L	170,000	NA	6,230	205,000	25,000	NA	NA	NA
Lead	ug/L	14.3	NA	1.10 J	43.0	5.40	NA	NA	NA
Magnesium	ug/L	37,100	NA	7,740	18,600	23,800	NA	NA	NA
Manganese	ug/L	4,490	NA	148	3,740	301	NA	NA	NA
Mercury	ug/L	0.200 U	NA	0.200 U	0.200 U	0.230	NA	NA	NA
Nickel	ug/L	171	NA	3.20	205	30.6	NA	NA	NA
Potassium	ug/L	16,100	NA	2,530	16,200	4,280 J	NA	NA	NA
Selenium	ug/L	5.00 U	NA	1.20 U	5.00 U	5.00 U	NA	NA	NA
Silver	ug/L	10.0 U	NA	2.50 U	10.0 U	10.0 U	NA	NA	NA
Sodium	ug/L	15,400	NA	11,400	13,300	13,000	NA	NA	NA
Thallium	ug/L	10.0 U	NA	2.50 U	10.0 U	10.0 U	NA	NA	NA
Vanadium	ug/L	109	NA	6.50 J	246	27.2 J	NA	NA	NA
Zinc	ug/L	226	NA	8.50	210	26.4	NA	NA	NA
Inorganics-Filtered									
Aluminum	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Barium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Copper	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Iron	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Lead	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Silver	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	ug/L	NA	NA	NA	NA	NA	NA	NA	NA
Best Results									
1,2,4-Trichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Location ID: / Sample Depth: / Date Collected:	Units	1041HP001 05/09/08	1041HP001 06/29/08	1041HP002 05/08/08	1041HP003 05/09/08	1041HP004 05/09/08	1041HP015 06/27/08	1041HP016 17 - 28 06/27/08	1041HP017 22 - 25 06/27/08
1,2-Dichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4-Dinitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.20 U	NA	NA	NA
2,6-Dinitrotoluene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.20 U	NA	NA	NA
2-Methylnaphthalene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Acenaphthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Acenaphthylene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Anthracene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Benzo(a)anthracene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Benzo(a)pyrene	ug/L	2.0 U	NA	2.2 U	1.9 U	2.0 U	NA	NA	NA
Benzo(b)fluoranthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Benzo(g,h,i)perylene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Benzo(k)fluoranthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Chrysene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Dibenzo(a,h)anthracene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Dinitrotoluene Mix	ug/L	0.22 U	NA	0.22 U	0.21 U	0.20 U	NA	NA	NA
Fluoranthene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Fluorene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Hexachlorobutadiene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/L	5.0 U	NA	5.6 UJ	4.8 U	5.0 U	NA	NA	NA
Naphthalene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA
Nitrobenzene	ug/L	0.22 U	NA	0.22 U	0.21 U	0.20 U	NA	NA	NA
Pyrene	ug/L	5.0 U	NA	5.6 U	4.8 U	5.0 U	NA	NA	NA

Location ID: / Sample Depth: / Date Collected:	Units	1041HP017 30 - 33 06/27/08	1041HP018 22 - 25 06/27/08	1041HP018 31 - 34 06/27/08	1041HP019 18 - 28 06/30/08	1041HP020 25 - 30 07/08/09	1041HP021 21 - 26 07/08/09
Explosives							
1,3,5-Trinitrobenzene	ug/L	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	ug/L	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
2-Amino-4,6-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
4-Amino-2,6-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	ug/L	NA	NA	NA	NA	NA	NA
HMX	ug/L	NA	NA	NA	NA	NA	NA
m-Nitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
Nitrobenzene	ug/L	NA	NA	NA	NA	NA	NA
Nitroglycerine	ug/L	NA	NA	NA	NA	NA	NA
o-Nitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
Pentaerythritol Tetranitrate	ug/L	NA	NA	NA	NA	NA	NA
p-Nitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
RDX	ug/L	NA	NA	NA	NA	NA	NA
Tetryl	ug/L	NA	NA	NA	NA	NA	NA
PCBs							
Aroclor-1016	ug/L	NA	NA	NA	NA	NA	NA
Aroclor-1221	ug/L	NA	NA	NA	NA	NA	NA
Aroclor-1232	ug/L	NA	NA	NA	NA	NA	NA
Aroclor-1242	ug/L	NA	NA	NA	NA	NA	NA
Aroclor-1248	ug/L	NA	NA	NA	NA	NA	NA
Aroclor-1254	ug/L	NA	NA	NA	NA	NA	NA
Aroclor-1260	ug/L	NA	NA	NA	NA	NA	NA
Volatile Organics							
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,1,2-trichloro-1,2,2-trifluoroethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,1-Dichloroethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,1-Dichloroethene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,2,3-Trichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 UJ	NA	NA
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 UJ	NA	NA
1,2-Dibromo-3-chloropropane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,2-Dibromoethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,2-Dichloroethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA

Location ID: Sample Depth: Date Collected:	Units	1041HP017 30 - 33 06/27/08	1041HP018 22 - 25 06/27/08	1041HP018 31 - 34 06/27/08	1041HP019 18 - 28 06/30/08	1041HP020 25 - 30 07/08/09	1041HP021 21 - 26 07/08/09
1,2-Dichloropropane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,4-Dioxane	ug/L	5.0 UJ	5.0 UJ [5.0 UJ]	5.0 UJ	10 UJ	NA	NA
2-Butanone	ug/L	10 U	10 U [10 U]	10 U	10 U	NA	NA
2-Hexanone	ug/L	5.0 U	5.0 U [5.0 U]	5.0 U	5.0 U	NA	NA
4-Methyl-2-pentanone	ug/L	5.0 U	5.0 U [5.0 U]	5.0 U	5.0 U	NA	NA
Acetone	ug/L	13	9.7 [8.6]	19	2.7	NA	NA
Benzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Bromochloromethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Bromodichloromethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Bromoform	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Bromomethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 UJ	NA	NA
Carbon Disulfide	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Carbon Tetrachloride	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Chlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Chloroethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Chloroform	ug/L	52	38 [37]	48	31	NA	NA
Chloromethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Cyclohexane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Dibromochloromethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Dichlorodifluoromethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Ethylbenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Isopropylbenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Methyl acetate	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Methyl tert-butyl ether	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Methylcylohexane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Methylene Chloride	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Styrene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Tetrachloroethene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Toluene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Trichloroethene	ug/L	1.0 U	1.0 U [1.0 U]	0.32 J	1.0 U	NA	NA
Trichlorofluoromethane	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Vinyl Chloride	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
Xylenes (total)	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA

Location ID: / Sample Depth: / Date Collected:	Units	1041HP017 30 - 33 06/27/08	1041HP018 22 - 25 06/27/08	1041HP018 31 - 34 06/27/08	1041HP019 18 - 28 06/30/08	1041HP020 25 - 30 07/08/09	1041HP021 21 - 26 07/08/09
Semivolatile Organics							
1,1'-Biphenyl	ug/L	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	ug/L	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	ug/L	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	ug/L	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	ug/L	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	ug/L	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	ug/L	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	ug/L	NA	NA	NA	NA	NA	NA
2-Chlorophenol	ug/L	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/L	NA	NA	NA	NA	NA	NA
2-Methylphenol	ug/L	NA	NA	NA	NA	NA	NA
2-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA
2-Nitrophenol	ug/L	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	ug/L	NA	NA	NA	NA	NA	NA
3-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	ug/L	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	ug/L	NA	NA	NA	NA	NA	NA
4-Chloro-3-Methylphenol	ug/L	NA	NA	NA	NA	NA	NA
4-Chloroaniline	ug/L	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	ug/L	NA	NA	NA	NA	NA	NA
4-Methylphenol	ug/L	NA	NA	NA	NA	NA	NA
4-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA
4-Nitrophenol	ug/L	NA	NA	NA	NA	NA	NA
Acenaphthene	ug/L	NA	NA	NA	NA	NA	NA
Acenaphthylene	ug/L	NA	NA	NA	NA	NA	NA
Acetophenone	ug/L	NA	NA	NA	NA	NA	NA
Anthracene	ug/L	NA	NA	NA	NA	NA	NA
Atrazine	ug/L	NA	NA	NA	NA	NA	NA
Benzaldehyde	ug/L	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	ug/L	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	ug/L	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	ug/L	NA	NA	NA	NA	NA	NA

Location ID: Sample Depth: Date Collected:	Units	1041HP017 30 - 33 06/27/08	1041HP018 22 - 25 06/27/08	1041HP018 31 - 34 06/27/08	1041HP019 18 - 28 06/30/08	1041HP020 25 - 30 07/08/09	1041HP021 21 - 26 07/08/09
bis(2-Chloroisopropyl)ether	ug/L	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	ug/L	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	ug/L	NA	NA	NA	NA	NA	NA
Caprolactam	ug/L	NA	NA	NA	NA	NA	NA
Carbazole	ug/L	NA	NA	NA	NA	NA	NA
Chrysene	ug/L	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	ug/L	NA	NA	NA	NA	NA	NA
Dibenzofuran	ug/L	NA	NA	NA	NA	NA	NA
Diethylphthalate	ug/L	NA	NA	NA	NA	NA	NA
Dimethylphthalate	ug/L	NA	NA	NA	NA	NA	NA
Di-n-Butylphthalate	ug/L	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	ug/L	NA	NA	NA	NA	NA	NA
Di-n-Octylphthalate	ug/L	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/L	NA	NA	NA	NA	NA	NA
Fluorene	ug/L	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	ug/L	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	ug/L	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	ug/L	NA	NA	NA	NA	NA	NA
Hexachloroethane	ug/L	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/L	NA	NA	NA	NA	NA	NA
Isophorone	ug/L	NA	NA	NA	NA	NA	NA
Naphthalene	ug/L	NA	NA	NA	NA	NA	NA
Nitrobenzene	ug/L	NA	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	ug/L	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	ug/L	NA	NA	NA	NA	NA	NA
Pentachlorophenol	ug/L	NA	NA	NA	NA	NA	NA
Phenol	ug/L	NA	NA	NA	NA	NA	NA
Pyrene	ug/L	NA	NA	NA	NA	NA	NA
Inorganics							
Aluminum	ug/L	NA	NA	NA	NA	349,000	1,090,000
Antimony	ug/L	NA	NA	NA	NA	150 U	150 U
Arsenic	ug/L	NA	NA	NA	NA	124	188
Barium	ug/L	NA	NA	NA	NA	4,220	6,420
Beryllium	ug/L	NA	NA	NA	NA	42.0	54.4
Cadmium	ug/L	NA	NA	NA	NA	10.2 UB	14.6 J
Calcium	ug/L	NA	NA	NA	NA	67,200 J	348,000 J
Chromium	ug/L	NA	NA	NA	NA	716	2,720
Cobalt	ug/L	NA	NA	NA	NA	1,080	1,090
Copper	ug/L	NA	NA	NA	NA	1,040	852

Location ID: Sample Depth: Date Collected:	Units	1041HP017 30 - 33 06/27/08	1041HP018 22 - 25 06/27/08	1041HP018 31 - 34 06/27/08	1041HP019 18 - 28 06/30/08	1041HP020 25 - 30 07/08/09	1041HP021 21 - 26 07/08/09
Iron	ug/L	NA	NA	NA	NA	2,000,000	2,570,000
Lead	ug/L	NA	NA	NA	NA	220	230
Magnesium	ug/L	NA	NA	NA	NA	186,000	823,000
Manganese	ug/L	NA	NA	NA	NA	57,800 J	41,300 J
Mercury	ug/L	NA	NA	NA	NA	0.470	0.520
Nickel	ug/L	NA	NA	NA	NA	2,340	3,220
Potassium	ug/L	NA	NA	NA	NA	23,700	134,000
Selenium	ug/L	NA	NA	NA	NA	50.0 U	50.0 U
Silver	ug/L	NA	NA	NA	NA	100 U	100 U
Sodium	ug/L	NA	NA	NA	NA	20,700 J	15,500 J
Thallium	ug/L	NA	NA	NA	NA	100 U	100 U
Vanadium	ug/L	NA	NA	NA	NA	1,390	2,700
Zinc	ug/L	NA	NA	NA	NA	1,800	2,190
Inorganics-Filtered							
Aluminum	ug/L	NA	NA	NA	NA	13,100	200 U
Antimony	ug/L	NA	NA	NA	NA	15.0 U	15.0 U
Arsenic	ug/L	NA	NA	NA	NA	12.9	10.0 U
Barium	ug/L	NA	NA	NA	NA	184	52.9
Beryllium	ug/L	NA	NA	NA	NA	1.40 J	5.00 U
Cadmium	ug/L	NA	NA	NA	NA	5.00 U	5.00 U
Calcium	ug/L	NA	NA	NA	NA	18,800 J	20,900 J
Chromium	ug/L	NA	NA	NA	NA	24.0	10.0 U
Cobalt	ug/L	NA	NA	NA	NA	33.0	15.0 U
Copper	ug/L	NA	NA	NA	NA	37.0	10.0 U
Iron	ug/L	NA	NA	NA	NA	82,600 J	100 U
Lead	ug/L	NA	NA	NA	NA	7.50	3.00 U
Magnesium	ug/L	NA	NA	NA	NA	13,000	11,400
Manganese	ug/L	NA	NA	NA	NA	2,180	133
Mercury	ug/L	NA	NA	NA	NA	0.200 U	0.200 U
Nickel	ug/L	NA	NA	NA	NA	83.5	10.0 U
Potassium	ug/L	NA	NA	NA	NA	8,210	6,840
Selenium	ug/L	NA	NA	NA	NA	5.00 U	5.00 U
Silver	ug/L	NA	NA	NA	NA	10.0 U	10.0 U
Sodium	ug/L	NA	NA	NA	NA	19,400	14,800
Thallium	ug/L	NA	NA	NA	NA	10.0 U	10.0 U
Vanadium	ug/L	NA	NA	NA	NA	53.0	15.0 U
Zinc	ug/L	NA	NA	NA	NA	61.3	20.0 U
Best Results							
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 UJ	NA	NA

Location ID: Sample Depth: Date Collected:	Units	1041HP017 30 - 33 06/27/08	1041HP018 22 - 25 06/27/08	1041HP018 31 - 34 06/27/08	1041HP019 18 - 28 06/30/08	1041HP020 25 - 30 07/08/09	1041HP021 21 - 26 07/08/09
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U	NA	NA
2,4-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	ug/L	NA	NA	NA	NA	NA	NA
Acenaphthene	ug/L	NA	NA	NA	NA	NA	NA
Acenaphthylene	ug/L	NA	NA	NA	NA	NA	NA
Anthracene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	ug/L	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	ug/L	NA	NA	NA	NA	NA	NA
Chrysene	ug/L	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	ug/L	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	ug/L	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/L	NA	NA	NA	NA	NA	NA
Fluorene	ug/L	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	ug/L	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/L	NA	NA	NA	NA	NA	NA
Naphthalene	ug/L	NA	NA	NA	NA	NA	NA
Nitrobenzene	ug/L	NA	NA	NA	NA	NA	NA
Pyrene	ug/L	NA	NA	NA	NA	NA	NA

Table F-6. Summary of Laboratory Analytical Results for Soil Gas at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Units	1549SG001 05/07/08	1549SG003 05/07/08	1549SG004 05/07/08	1549SG006 05/07/08	1549SG007 05/07/08	1549SG008 05/07/08	1549SLB00A 05/06/08
Volatile Organics								
1,1,1-Trichloroethane	ug/m3	<7.0	<6.9	3.1 J	<7.2	<7.9	<7.3	<6.3
1,1,2,2-Tetrachloroethane	ug/m3	<8.8	<8.7	<10	<9.1	<9.9	<9.2	<7.9
1,1,2-trichloro-1,2,2-trifluoroethane	ug/m3	<9.9	<9.7	<11	<10	<11	<10	<8.8
1,1,2-Trichloroethane	ug/m3	<7.0	<6.9	<8.1	<7.2	<7.9	<7.3	<6.3
1,1-Dichloroethane	ug/m3	<5.2	<5.1	2.0 J	<5.3	<5.8	<5.4	<4.6
1,1-Dichloroethene	ug/m3	<5.1	<5.0	<5.9	<5.2	<5.7	<5.3	<4.6
1,2,4-Trichlorobenzene	ug/m3	<38	<38	<44	<39	<43	<40	<34
1,2,4-Trimethylbenzene	ug/m3	1.2 J	3.2 J	7.8	<6.5	1.5 J	110	4.2 J
1,2-Dibromoethane	ug/m3	<9.9	<9.7	<11	<10	<11	<10	<8.8
1,2-Dichlorobenzene	ug/m3	5.4 J	<7.6	7.9 J	<7.9	<8.7	<8.1	<6.9
1,2-Dichloroethane	ug/m3	<5.2	<5.1	<6.0	<5.3	<5.8	<5.4	<4.6
1,2-Dichloropropane	ug/m3	<6.0	<5.8	<6.8	<6.1	<6.7	<6.2	<5.3
1,3,5-Trimethylbenzene	ug/m3	<6.3	2.0 J	<7.3	<6.5	<7.1	94	2.6 J
1,3-Butadiene	ug/m3	10	12	10	12	14	43	<2.5
1,3-Dichlorobenzene	ug/m3	0.87 J	<7.6	<8.9	<7.9	<8.7	<8.1	<6.9
1,4-Dichlorobenzene	ug/m3	3.2 J	<7.6	2.5 J	<7.9	<8.7	<8.1	<6.9
1,4-Dioxane	ug/m3	<18	<18	5.5 J	<19	<21	<19	<16
2,2,4-Trimethylpentane	ug/m3	<6.0	<5.9	<6.9	<6.2	<6.8	180	<5.4
2-Butanone	ug/m3	82	40	89	100	33	62	4.0
2-Hexanone	ug/m3	6.8 J	<21	11 J	15 J	2.3 J	<22	<19
2-Propanol	ug/m3	<13	4.1 J	17	8.6 J	<14	3.6 J	0.76 J
3-Chloropropene	ug/m3	<16	<16	<18	<16	<18	<17	<14
4-Ethyltoluene	ug/m3	<6.3	2.7 J	6.0 J	1.0 J	1.6 J	54	2.2 J
4-Methyl-2-pentanone	ug/m3	4.8 J	4.2 J	8.5	10	2.1 J	<5.5	<4.7
Acetone	ug/m3	370	260	720	500	120	260	48
Benzene	ug/m3	5.8	7.9	7.7	9.5	8.2	34	1.3 J
Benzyl Chloride	ug/m3	<6.7	<6.5	<7.7	<6.8	<7.5	<7.0	<6.0
Bromodichloromethane	ug/m3	<8.6	<8.5	<9.9	<8.8	<9.7	<9.0	<7.7
Bromoform	ug/m3	<13	<13	<15	<14	<15	<14	<12
Bromomethane	ug/m3	<5.0	<4.9	<5.7	<5.1	<5.6	<5.2	<4.5
Carbon Disulfide	ug/m3	2.0 J	2.8 J	9.3	<4.1	12	16	1.5 J
Carbon Tetrachloride	ug/m3	<8.1	<8.0	<9.3	<8.3	<9.1	<8.5	<7.2
Chlorobenzene	ug/m3	<5.9	<5.8	<6.8	<6.1	<6.6	<6.2	<5.3
Chloroethane	ug/m3	<3.4	<3.3	<3.9	<3.5	<3.8	<3.5	<3.0
Chloroform	ug/m3	<6.3	<6.2	<7.2	<6.4	<7.0	<6.6	<5.6
Chloromethane	ug/m3	<11	<10	4.2 J	<11	<12	<11	<9.5
cis-1,2-Dichloroethene	ug/m3	<5.1	<5.0	29	<5.2	<5.7	<5.3	<4.6
cis-1,3-Dichloropropene	ug/m3	<5.8	<5.7	<6.7	<6.0	<6.6	<6.1	<5.2
Cyclohexane	ug/m3	<4.4	34	22	1.5 J	1.4 J	56	0.73 J
Dibromochloromethane	ug/m3	<11	<11	<13	<11	<12	<11	<9.8
Dichlorodifluoromethane	ug/m3	<6.4	3.0 J	<7.3	2.6 J	<7.1	2.8 J	1.6 J
Ethanol	ug/m3	120	49	90	21	6.1 J	7.4 J	<8.7
Ethylbenzene	ug/m3	<5.6	3.8 J	2.9 J	2.2 J	3.2 J	9.8	4.4 J

Table F-6. Summary of Laboratory Analytical Results for Soil Gas at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: / Date Collected:	Units	1549SG001 05/07/08	1549SG003 05/07/08	1549SG004 05/07/08	1549SG006 05/07/08	1549SG007 05/07/08	1549SG008 05/07/08	1549SLB00A 05/06/08
Freon 114	ug/m3	<9.0	<8.8	<10	<9.2	<10	<9.4	<8.0
Heptane	ug/m3	<5.2	18	50	16	6.8	64	1.9 J
Hexachlorobutadiene	ug/m3	<55	<54	<63	<56	<62	<57	<49
Hexane	ug/m3	<4.5	<4.4	30	<4.6	<5.1	61	2.8 J
Isopropylbenzene	ug/m3	<6.3	1.1 J	1.3 J	<6.5	1.0 J	10	<5.6
m,p-Xylene	ug/m3	1.3 J	8.3	5.8 J	3.4 J	3.0 J	28	17
Methyl tert-butyl ether	ug/m3	<4.6	<4.6	<5.3	<4.8	<5.2	42	<4.1
Methylene Chloride	ug/m3	<4.5	1.1 J	2.0 J	<4.6	<5.0	1.0 J	1.2 J
n-Propylbenzene	ug/m3	<6.3	1.4 J	2.0 J	<6.5	<7.1	16	1.1 J
o-Xylene	ug/m3	0.70 J	5.5	4.9 J	1.8 J	1.9 J	29	7.7
Styrene	ug/m3	0.82 J	1.9 J	1.3 J	1.9 J	1.4 J	<5.7	<4.9
Tetrachloroethene	ug/m3	<8.8	<8.6	4.1 J	<9.0	<9.8	<9.1	<7.8
Tetrahydrofuran	ug/m3	15	<3.7	4.1 J	<3.9	<4.3	<4.0	1.8 J
Toluene	ug/m3	4.1 J	9.7	7.1	11	6.9	37	2.4 J
trans-1,2-Dichloroethene	ug/m3	<5.1	<5.0	<5.9	<5.2	<5.7	<5.3	<4.6
trans-1,3-Dichloropropene	ug/m3	<5.8	<5.7	<6.7	<6.0	<6.6	<6.1	<5.2
Trichloroethene	ug/m3	<6.9	3.7 J	3.6 J	<7.1	<7.8	<7.2	<6.2
Trichlorofluoromethane	ug/m3	1.5 J	1.7 J	7.1 J	<7.4	4.5 J	2.0 J	1.9 J
Vinyl Chloride	ug/m3	<3.3	<3.2	<3.8	<3.4	<3.7	<3.4	<2.9
Xylenes (total)	ug/m3	2.0 J	14	11 J	5.2 J	4.9 J	57	25

Table F-7. Summary of Laboratory Analytical Results for Soil at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID:		1549SB001	1549SB001	1549SB003	1549SB003	1549SB004	1549SB004	1549SB006	1549SB006
Sample Depth(Feet):		0.5 - 1.5	7 - 8	0.5 - 1.5	5 - 6	0.5 - 1.5	5 - 6	0.5 - 1.5	5 - 6
Date Collected:	Units	05/07/08	05/07/08	05/07/08	05/07/08	05/07/08	05/07/08	05/07/08	05/07/08
Volatile Organics									
1,1,1-Trichloroethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,1,2,2-Tetrachloroethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,1,2-trichloro-1,2,2-trifluoroethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,1,2-Trichloroethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,1-Dichloroethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,1-Dichloroethene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,2,3-Trichlorobenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,2,4-Trichlorobenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,2-Dibromo-3-chloropropane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,2-Dibromoethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,2-Dichlorobenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,2-Dichloroethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,2-Dichloropropane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,3-Dichlorobenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,4-Dichlorobenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
1,4-Dioxane	mg/kg	<0.061	<0.061 J	<0.054 [<0.066]	<0.049 J	<0.047	<0.057 J	<0.051	<0.052 J
2-Butanone	mg/kg	<0.012	<0.012	0.0053 J [<0.013]	0.010 J	<0.0094	0.036 J	0.0036 J	0.0053 J
2-Hexanone	mg/kg	<0.012	<0.012	<0.011 [<0.013]	<0.0098	<0.0094	<0.011	<0.010	<0.010
4-Methyl-2-pentanone	mg/kg	<0.012	<0.012	<0.011 [<0.013]	<0.0098	<0.0094	<0.011	<0.010	<0.010
Acetone	mg/kg	0.022	0.035	0.044 [0.033]	0.034	0.017	0.14	0.027	<0.010
Benzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Bromochloromethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Bromodichloromethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Bromoform	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Bromomethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Carbon Disulfide	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	0.00036 J	<0.0051	0.00048 J
Carbon Tetrachloride	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Chlorobenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Chloroethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Chloroform	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Chloromethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
cis-1,2-Dichloroethene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
cis-1,3-Dichloropropene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Cyclohexane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Dibromochloromethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Dichlorodifluoromethane	mg/kg	0.012	0.00098 J	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Ethylbenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Isopropylbenzene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Methyl acetate	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Methyl tert-butyl ether	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Methylcylohexane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	0.00034 J	<0.0057	<0.0051	<0.0052
Methylene Chloride	mg/kg	<0.0071 B	<0.0076 B	<0.0063 B [<0.0061 B]	<0.0050 B	<0.0046 B	<0.010 B	<0.0048 B	<0.0094 B
Styrene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Tetrachloroethene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Toluene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	0.00044 J	<0.0051	<0.0052
trans-1,2-Dichloroethene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052

Table F-7. Summary of Laboratory Analytical Results for Soil at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1549SB001 0.5 - 1.5 05/07/08	1549SB001 7 - 8 05/07/08	1549SB003 0.5 - 1.5 05/07/08	1549SB003 5 - 6 05/07/08	1549SB004 0.5 - 1.5 05/07/08	1549SB004 5 - 6 05/07/08	1549SB006 0.5 - 1.5 05/07/08	1549SB006 5 - 6 05/07/08
trans-1,3-Dichloropropene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Trichloroethene	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Trichlorofluoromethane	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Vinyl Chloride	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Xylenes (total)	mg/kg	<0.0061	<0.0061	<0.0054 [<0.0066]	<0.0049	<0.0047	<0.0057	<0.0051	<0.0052
Semivolatile Organics									
1,1'-Biphenyl	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
1,2,4,5-Tetrachlorobenzene	mg/kg	<0.44 J	<0.39	<0.43 J [<0.42 J]	<0.38	<0.40 J	<0.42	<0.42 J	<0.42
2,4,5-Trichlorophenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2,4,6-Trichlorophenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2,4-Dichlorophenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2,4-Dimethylphenol	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
2,4-Dinitrophenol	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
2,4-Dinitrotoluene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2,6-Dinitrotoluene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2-Chloronaphthalene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2-Chlorophenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2-Methylnaphthalene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2-Methylphenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
2-Nitroaniline	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
2-Nitrophenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
3,3'-Dichlorobenzidine	mg/kg	<0.44 J	<0.39 J	<0.43 J [<0.42 J]	<0.38 J	<0.40 J	<0.42 J	<0.42 J	<0.42 J
3-Nitroaniline	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
4,6-Dinitro-2-methylphenol	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
4-Bromophenyl-phenylether	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
4-Chloro-3-Methylphenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
4-Chloroaniline	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
4-Chlorophenyl-phenylether	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
4-Methylphenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
4-Nitroaniline	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
4-Nitrophenol	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
Acenaphthene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Acenaphthylene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Acetophenone	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Anthracene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Atrazine	mg/kg	<0.44 J	<0.39	<0.43 J [<0.42 J]	<0.38	<0.40 J	<0.42	<0.42 J	<0.42
Benzaldehyde	mg/kg	<0.44 J	R	<0.43 J [<0.42 J]	R	<0.40 J	R	<0.42 J	R
Benzo(a)anthracene	mg/kg	<0.18	<0.16	<0.17 [<0.17 J]	<0.15	<0.16	<0.17	<0.17	<0.17
Benzo(a)pyrene	mg/kg	<0.18	<0.16	<0.17 [<0.17 J]	<0.15	<0.16	<0.17	<0.17	<0.17
Benzo(b)fluoranthene	mg/kg	<0.18	<0.16	<0.17 [<0.17 J]	<0.15	<0.16	<0.17	<0.17	<0.17
Benzo(g,h,i)perylene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Benzo(k)fluoranthene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
bis(2-Chloroethoxy)methane	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
bis(2-Chloroethyl)ether	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
bis(2-Chloroisopropyl)ether	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
bis(2-Ethylhexyl)phthalate	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Butylbenzylphthalate	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42

Table F-7. Summary of Laboratory Analytical Results for Soil at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1549SB001 0.5 - 1.5 05/07/08	1549SB001 7 - 8 05/07/08	1549SB003 0.5 - 1.5 05/07/08	1549SB003 5 - 6 05/07/08	1549SB004 0.5 - 1.5 05/07/08	1549SB004 5 - 6 05/07/08	1549SB006 0.5 - 1.5 05/07/08	1549SB006 5 - 6 05/07/08
Caprolactam	mg/kg	<0.44	<0.39	0.10 J [<0.14 J]	<0.38	0.14 J	<0.42	0.12 J	<0.42
Carbazole	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Chrysene	mg/kg	<0.44	<0.39	<0.43 J [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Dibenzo(a,h)anthracene	mg/kg	<0.18	<0.16	<0.17 [<0.17 J]	<0.15	<0.16	<0.17	<0.17	<0.17
Dibenzofuran	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Diethylphthalate	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Dimethylphthalate	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Di-n-Butylphthalate	mg/kg	<0.44	<0.39	0.043 J [<0.42 J]	<0.38	0.042 J	<0.42	<0.42	<0.42
Dinitrotoluene Mix	mg/kg	<0.44	<0.39	<0.43 [<0.42]	<0.38	<0.40	<0.42	<0.42	<0.42
Di-n-Octylphthalate	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Fluoranthene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Fluorene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Hexachlorobenzene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Hexachlorobutadiene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Hexachlorocyclopentadiene	mg/kg	<0.44 J	<0.39 J	<0.43 J [<0.42 J]	<0.38 J	<0.40 J	<0.42 J	<0.42 J	<0.42 J
Hexachloroethane	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Indeno(1,2,3-cd)pyrene	mg/kg	0.18	<0.16	<0.17 [<0.17 J]	<0.15	<0.16	<0.17	<0.17	<0.17
Isophorone	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Naphthalene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Nitrobenzene	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
N-Nitroso-di-n-propylamine	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
N-Nitrosodiphenylamine	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Pentachlorophenol	mg/kg	<1.8	<1.6	<1.7 [<1.7 J]	<1.5	<1.6	<1.7	<1.7	<1.7
Phenol	mg/kg	<0.44	<0.39	<0.43 [<0.42 J]	<0.38	<0.40	<0.42	<0.42	<0.42
Pyrene	mg/kg	<0.44	<0.39 J	<0.43 [<0.42 J]	<0.38 J	<0.40	<0.42 J	<0.42	<0.42 J
Explosives									
1,3,5-Trinitrobenzene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
1,3-Dinitrobenzene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2,4,6-Trinitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2,4-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
2-Amino-4,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
4-Amino-2,6-Dinitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Dinitrotoluene Mix	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
HMX	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
m-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Nitrobenzene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Nitroglycerine	mg/kg	<5	<5	<5 [2.5 J]	<10	<5	<5	<5	<5
o-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Pentaerythritol Tetranitrate	mg/kg	<5	<5	<5 [<5]	<5	<5	<5	<5	<5
p-Nitrotoluene	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
RDX	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
Tetryl	mg/kg	<0.25	<0.25	<0.25 [<0.25]	<0.25	<0.25	<0.25	<0.25	<0.25
PCBs									
Aroclor-1016	mg/kg	<0.022	<0.020	<0.022 [<0.021]	<0.019	<0.020	<0.021	<0.021	<0.020
Aroclor-1221	mg/kg	<0.022	<0.020	<0.022 [<0.021]	<0.019	<0.020	<0.021	<0.021	<0.020
Aroclor-1232	mg/kg	<0.022	<0.020	<0.022 [<0.021]	<0.019	<0.020	<0.021	<0.021	<0.020

Table F-7. Summary of Laboratory Analytical Results for Soil at Building 1549
RAAP-047 RFI Report, Radford Army Ammunition Plant, Radford, Virginia

Location ID: Sample Depth(Feet): Date Collected:	Units	1549SB001 0.5 - 1.5 05/07/08	1549SB001 7 - 8 05/07/08	1549SB003 0.5 - 1.5 05/07/08	1549SB003 5 - 6 05/07/08	1549SB004 0.5 - 1.5 05/07/08	1549SB004 5 - 6 05/07/08	1549SB006 0.5 - 1.5 05/07/08	1549SB006 5 - 6 05/07/08
Aroclor-1242	mg/kg	<0.022	<0.020	<0.022 [<0.021]	<0.019	<0.020	<0.021	<0.021	<0.020
Aroclor-1248	mg/kg	<0.022	<0.020	<0.022 [<0.021]	<0.019	<0.020	<0.021	<0.021	<0.020
Aroclor-1254	mg/kg	0.093	<0.020	<0.022 J [0.095 J]	<0.019	<0.020	0.021	<0.021	<0.020
Aroclor-1260	mg/kg	<0.022	<0.020	<0.022 J [0.16 J]	<0.019	<0.020	<0.021	<0.021	<0.020
Inorganics									
Aluminum	mg/kg	35,400	15,000	33,000 [40,700]	7,080	26,200	21,500	27,100	27,100
Antimony	mg/kg	<3.90 J	<3.40 J	<3.80 J [<3.80 J]	<3.40 J	<3.50 J	<3.80 J	<3.70 J	<3.70 J
Arsenic	mg/kg	6.70	1.70	4.70 [5.30]	1.50	2.90	4.10	5.80	5.20
Barium	mg/kg	70.1	41.6	80.6 [60.3]	59.9	56.9	68.7	82.9	78.8
Beryllium	mg/kg	1.70 J	0.230	1.00 J [0.610 J]	0.360	0.470 J	0.780	1.20 J	1.20
Cadmium	mg/kg	<1.30	0.260	<1.30 [<1.30]	<1.10	<1.20	0.540	<1.20	0.640
Calcium	mg/kg	3,550 J	320	6,620 J [1,140 J]	1,560	3,280 J	16,000	9,460 J	953
Chromium	mg/kg	35.3	19.8	33.8 [40.0]	10.0	31.7	25.8	31.7	35.5
Cobalt	mg/kg	11.8	1.70	8.40 J [3.40 J]	3.40	6.00	8.80	9.80	10.1
Copper	mg/kg	23.3	5.10	17.2 [19.5]	3.50	11.7	29.5	14.9	20.0
Iron	mg/kg	42,100	19,400	35,100 [53,100]	7,490	30,400	25,100	30,300	34,500
Lead	mg/kg	16.4	10.2	15.4 [15.0]	11.2	13.6	62.2	15.8	13.4
Magnesium	mg/kg	5,690 J	654	6,480 J [1,180 J]	980	2,160 J	10,600	8,230 J	3,890
Manganese	mg/kg	258 J	83.6 J	347 J [143 J]	201 J	457 J	341 J	154 J	147 J
Mercury	mg/kg	0.0800 J	0.0540 J	0.0610 J [0.130 J]	<0.0360 J	0.0630 J	0.0690 J	0.0410 J	0.0650 J
Nickel	mg/kg	23.2	3.10	15.4 [10.8]	2.50	8.30	11.6	16.8	17.5
Potassium	mg/kg	2,640	559	1,680 [1,030]	301	835	1,200	1,940	1,970
Selenium	mg/kg	<1.30	<1.10	<1.30 [<1.30]	<1.10	0.880 J	<1.30	<1.20	<1.20
Silver	mg/kg	<2.60	<2.30	<2.50 [<2.50]	<2.30	<2.30	<2.50	<2.50	<2.50
Sodium	mg/kg	<1,290	<1,140	<1,270 J [275 J]	<1,140	272	<1,270	312	<1,240
Thallium	mg/kg	<2.60	<2.30	<2.50 [<2.50]	<2.30	<2.30	<2.50	<2.50	<2.50
Vanadium	mg/kg	67.5	41.2	65.6 [99.5]	19.8	60.5	47.8	55.6	59.7
Zinc	mg/kg	44.1	16.7	37.3 [41.7]	14.3	26.3	40.4	39.8	28.4

Table F-8
Summary of Groundwater Sample Analytical Results
RAAP-047

Location ID: / Sample Depth: / Date Collected:	Units	1549 HP008 05/10/08	1549HP009 19 - 29 07/08/09	1549HP010 20 - 30 07/08/09
Explosives				
1,3,5-Trinitrobenzene	ug/L	0.2 U	NA	NA
1,3-Dinitrobenzene	ug/L	0.2 U	NA	NA
2,4,6-Trinitrotoluene	ug/L	0.2 U	NA	NA
2,4-Dinitrotoluene	ug/L	0.2 U	NA	NA
2,6-Dinitrotoluene	ug/L	0.2 U	NA	NA
2-Amino-4,6-Dinitrotoluene	ug/L	0.2 U	NA	NA
4-Amino-2,6-Dinitrotoluene	ug/L	0.2 U	NA	NA
Dinitrotoluene Mix	ug/L	0.2 U	NA	NA
HMX	ug/L	0.2 U	NA	NA
m-Nitrotoluene	ug/L	0.2 U	NA	NA
Nitrobenzene	ug/L	0.2 U	NA	NA
Nitroglycerine	ug/L	4 U	NA	NA
o-Nitrotoluene	ug/L	0.2 U	NA	NA
Pentaerythritol Tetranitrate	ug/L	4 U	NA	NA
p-Nitrotoluene	ug/L	0.2 U	NA	NA
RDX	ug/L	0.2 U	NA	NA
Tetryl	ug/L	0.2 U	NA	NA
PCBs				
Aroclor-1016	ug/L	0.50 U	NA	NA
Aroclor-1221	ug/L	0.50 U	NA	NA
Aroclor-1232	ug/L	0.50 U	NA	NA
Aroclor-1242	ug/L	0.50 U	NA	NA
Aroclor-1248	ug/L	0.50 U	NA	NA
Aroclor-1254	ug/L	0.50 U	NA	NA
Aroclor-1260	ug/L	0.50 U	NA	NA
Volatile Organics				
1,1,1-Trichloroethane	ug/L	1.0 U	NA	NA
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	NA	NA
1,1,2-trichloro-1,2,2-trifluoroethane	ug/L	1.0 U	NA	NA
1,1,2-Trichloroethane	ug/L	1.0 U	NA	NA
1,1-Dichloroethane	ug/L	1.0 U	NA	NA
1,1-Dichloroethene	ug/L	1.0 U	NA	NA
1,2,3-Trichlorobenzene	ug/L	1.0 U	NA	NA
1,2,4-Trichlorobenzene	ug/L	1.0 U	NA	NA
1,2-Dibromo-3-chloropropane	ug/L	1.0 U	NA	NA
1,2-Dibromoethane	ug/L	1.0 U	NA	NA
1,2-Dichlorobenzene	ug/L	1.0 U	NA	NA
1,2-Dichloroethane	ug/L	1.0 U	NA	NA

Location ID: Sample Depth: Date Collected:	Units	1549 HP008 05/10/08	1549HP009 19 - 29 07/08/09	1549HP010 20 - 30 07/08/09
1,2-Dichloropropane	ug/L	1.0 U	NA	NA
1,3-Dichlorobenzene	ug/L	1.0 U	NA	NA
1,4-Dichlorobenzene	ug/L	1.0 U	NA	NA
1,4-Dioxane	ug/L	5.0 U	NA	NA
2-Butanone	ug/L	10 U	NA	NA
2-Hexanone	ug/L	5.0 U	NA	NA
4-Methyl-2-pentanone	ug/L	5.0 U	NA	NA
Acetone	ug/L	2.0 UB	NA	NA
Benzene	ug/L	1.0 U	NA	NA
Bromochloromethane	ug/L	1.0 U	NA	NA
Bromodichloromethane	ug/L	1.0 U	NA	NA
Bromoform	ug/L	1.0 U	NA	NA
Bromomethane	ug/L	1.0 U	NA	NA
Carbon Disulfide	ug/L	1.0 U	NA	NA
Carbon Tetrachloride	ug/L	1.0 U	NA	NA
Chlorobenzene	ug/L	1.0 U	NA	NA
Chloroethane	ug/L	1.0 U	NA	NA
Chloroform	ug/L	3.9 UB	NA	NA
Chloromethane	ug/L	1.0 U	NA	NA
cis-1,2-Dichloroethene	ug/L	1.0 U	NA	NA
cis-1,3-Dichloropropene	ug/L	1.0 U	NA	NA
Cyclohexane	ug/L	1.0 U	NA	NA
Dibromochloromethane	ug/L	1.0 U	NA	NA
Dichlorodifluoromethane	ug/L	1.0 U	NA	NA
Ethylbenzene	ug/L	1.0 U	NA	NA
Isopropylbenzene	ug/L	1.0 U	NA	NA
Methyl acetate	ug/L	1.0 U	NA	NA
Methyl tert-butyl ether	ug/L	1.0 U	NA	NA
Methylcylohexane	ug/L	1.0 U	NA	NA
Methylene Chloride	ug/L	1.0 U	NA	NA
Styrene	ug/L	1.0 U	NA	NA
Tetrachloroethene	ug/L	1.0 U	NA	NA
Toluene	ug/L	1.0 U	NA	NA
trans-1,2-Dichloroethene	ug/L	1.0 U	NA	NA
trans-1,3-Dichloropropene	ug/L	1.0 U	NA	NA
Trichloroethene	ug/L	1.0 U	NA	NA
Trichlorofluoromethane	ug/L	1.0 U	NA	NA
Vinyl Chloride	ug/L	1.0 U	NA	NA
Xylenes (total)	ug/L	1.0 U	NA	NA

Location ID: Sample Depth: Date Collected:	Units	1549 HP008 05/10/08	1549HP009 19 - 29 07/08/09	1549HP010 20 - 30 07/08/09
Inorganics				
Aluminum	ug/L	179,000	3,600,000	1,460,000
Antimony	ug/L	15.0 U	750 U	150 U
Arsenic	ug/L	35.0	1,380	935
Barium	ug/L	507	11,500	5,320
Beryllium	ug/L	6.60	212	102
Cadmium	ug/L	5.00 U	123 J	21.7 J
Calcium	ug/L	34,300	530,000 J	212,000 J
Chromium	ug/L	150	5,070	1,690
Cobalt	ug/L	213	2,960	1,090
Copper	ug/L	113	4,890	2,450
Iron	ug/L	197,000	6,150,000	3,530,000
Lead	ug/L	90.5	2,100	786
Magnesium	ug/L	26,800	2,780,000	1,080,000
Manganese	ug/L	7,660	95,700 J	69,100 J
Mercury	ug/L	0.360	5.00	2.60
Nickel	ug/L	87.5	6,390	3,050
Potassium	ug/L	11,000	180,000	55,800
Selenium	ug/L	5.00 U	250 U	50.0 U
Silver	ug/L	10.0 U	500 U	100 U
Sodium	ug/L	11,900	30,200 J	13,300 J
Thallium	ug/L	10.0 U	500 U	100 U
Vanadium	ug/L	353	5,950	2,930
Zinc	ug/L	387	4,990	12,300
Inorganics-Filtered				
Aluminum	ug/L	NA	200 U	200 U
Antimony	ug/L	NA	15.0 U	15.0 U
Arsenic	ug/L	NA	10.0 U	10.0 U
Barium	ug/L	NA	96.5	84.4
Beryllium	ug/L	NA	5.00 U	5.00 U
Cadmium	ug/L	NA	5.00 U	5.00 U
Calcium	ug/L	NA	60,200 J	71,100 J
Chromium	ug/L	NA	10.0 U	10.0 U
Cobalt	ug/L	NA	15.0 U	15.0 U
Copper	ug/L	NA	10.0 U	10.0 U
Iron	ug/L	NA	100 U	100 U
Lead	ug/L	NA	3.00 U	3.00 U
Magnesium	ug/L	NA	28,600	29,900
Manganese	ug/L	NA	164	172

Table F-8
Summary of Groundwater Sample Analytical Results
RAAP-047

Location ID: Sample Depth: Date Collected:	Units	1549 HP008 05/10/08	1549HP009 19 - 29 07/08/09	1549HP010 20 - 30 07/08/09
Mercury	ug/L	NA	0.200 U	0.200 U
Nickel	ug/L	NA	3.80 J	10.0 U
Potassium	ug/L	NA	3,570 J	3,380 J
Selenium	ug/L	NA	5.00 U	5.00 U
Silver	ug/L	NA	10.0 U	10.0 U
Sodium	ug/L	NA	21,600	11,900
Thallium	ug/L	NA	10.0 U	10.0 U
Vanadium	ug/L	NA	15.0 U	15.0 U
Zinc	ug/L	NA	20.0 U	8.40 UB
Best Results				
1,2,4-Trichlorobenzene	ug/L	1.0 U	NA	NA
1,2-Dichlorobenzene	ug/L	1.0 U	NA	NA
1,3-Dichlorobenzene	ug/L	1.0 U	NA	NA
1,4-Dichlorobenzene	ug/L	1.0 U	NA	NA
2,4-Dinitrotoluene	ug/L	0.20 U	NA	NA
2,6-Dinitrotoluene	ug/L	0.20 U	NA	NA
2-Methylnaphthalene	ug/L	NA	NA	NA
Acenaphthene	ug/L	NA	NA	NA
Acenaphthylene	ug/L	NA	NA	NA
Anthracene	ug/L	NA	NA	NA
Benzo(a)anthracene	ug/L	NA	NA	NA
Benzo(a)pyrene	ug/L	NA	NA	NA
Benzo(b)fluoranthene	ug/L	NA	NA	NA
Benzo(g,h,i)perylene	ug/L	NA	NA	NA
Benzo(k)fluoranthene	ug/L	NA	NA	NA
Chrysene	ug/L	NA	NA	NA
Dibenzo(a,h)anthracene	ug/L	NA	NA	NA
Dinitrotoluene Mix	ug/L	0.20 U	NA	NA
Fluoranthene	ug/L	NA	NA	NA
Fluorene	ug/L	NA	NA	NA
Hexachlorobutadiene	ug/L	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/L	NA	NA	NA
Naphthalene	ug/L	NA	NA	NA
Nitrobenzene	ug/L	0.20 U	NA	NA
Pyrene	ug/L	NA	NA	NA