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FINAL

RFI Report

RAAP-031: Area of Concern A – Nitrocellulose Rainwater Ditch

Prepared for:
Radford Army Ammunition Plant

July 2009

received
11-6-09

09-139

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

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
Area of Concern (AOC) A – Nitrocellulose Rainwater Ditch

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) July 2009 Final RFI Report for AOC-A, 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

Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.
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Radford, VA 24143-0100

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August 12, 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, Final RFI Report RAAP-031: Area of Concern A - Ntirocellulose Rainwater Ditch, July 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 July 22, 2009. Also enclosed is the 22 July 2009 transmittal email.

This document was revised per our June 23, 2009 partnering meeting in Philadelphia, PA that is summarized in the enclosed response to comments. We anticipate approval of this document.

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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09-815-130
JMcKenna

Rich Mendoza
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J. McKenna, ACO Staff
Rob Davie-ACO Staff
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Env. File

Coordination: J. McKenna

M. A. Miano

09-815-130
JMcKenna

Comments and Responses on the Draft RAAP-031: AOC A RFI Report

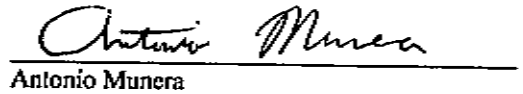
Radford Army Ammunition Plant
June 2009

Item No.	Report Reference	COMMENT	RESPONSE
Radford: VDEQ			
1.	General	The characterization of the site appears to be sufficient based on the results of the soil sampling. However, I disagree with the inclusion of subsurface soil data to calculate an exposure point concentration to assess residential risk. Although subsurface soil data is important for screening assessments (you need to know if high risk potential exist), the expected exposure scenario should be the same 0-1 feet that is used in the industrial worker scenario.	*Agreed. The report has been revised to include the assessment of potential risks to hypothetical future residents assuming no change in site conditions (i.e., exposure to surface soil [0-1 ft bgs]). The results of the risk assessment indicate that there are no unacceptable risks or hazards to future hypothetical residents exposed to surface soil. Therefore no change was made to the recommendation: No Further Action under an unrestricted land use.*
2.	Section 3.1, Page 7, and Figure 4	Also it appears that industrial soil RSLs were used to screen (Sect. 3.1, page 7 and Figure 4) but residential exposure was considered for the actual risk assessment. Please clarify.	*Section 3.1 presents a summary of the data and for discussion, results were compared to industrial screening levels only as that is the current and reasonably anticipated future land use. For the evaluation of potential health risks, COPCs for residential and industrial exposures were selected based upon the comparison of the maximum detected concentration to the applicable RSL.*

Concerning the following:

Radford Army Ammunition Plant
Final
RFI Report RAAP-031:
Area of Concern A – Nitrocellulose Rainwater Ditch
July 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: Antonio Munera
TITLE: LTC, CM
Commanding

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

09-815-130
JMcKenna

Greene, Anne

From: McKenna, Jim
Sent: Wednesday, July 22, 2009 2:11 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: Tracking numbers for AOC A (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.

Certification letter will follow from Radford AAP under separate cover.

Immediately below are the POCs with tracking numbers:

This document was revised to include the assessment of potential health risks associated with exposure to soil in the 0 to 1 ft depth interval by hypothetical future residents as discussed with EPA and VDEQ during our meeting of June 23, 2009. Our understanding is this was the only item to address therefore we anticipate approval.

POCs and Fed Ex tracking numbers

Mr. James McKenna 797782733403

Mr. Richard Mendoza 797782738585

Ms. Susan Ryan 797782744503

Mr. Tom Meyer 797782749159

Mr. Dennis Druck 797782755691

Mr. James Cutler 796795586644

Ms. Karen Sismour 797782762476

Ms. Elizabeth Lohman 797782773289

Mr. William Geiger 796795604923

Mr. Mark Bowen 797782786304

Mr. Tim Leahy 796795618415

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Classification: UNCLASSIFIED
Caveats: FOUO

DEPARTMENT OF THE ARMY
US ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND MD 21010-5403

MCHB-TS-REH

30 JUL 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: Final RCRA Facility Investigation Report for RAAP-031: Area of Concern A – Nitrocellulose Rainwater Ditch, Radford Army Ammunition Plant, Virginia, July 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.

2. We concur with the recommendation of clean closure with no further action.

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)

From: Geiger.William@epamail.epa.gov
Sent: Monday, June 15, 2009 1:56 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: AOC A RFI Comments

VDEQ comments on AOC A RFI.

The characterization of the site appears to be sufficient based on the results of the soil sampling. However, I disagree with the inclusion of subsurface soil data to calculate an exposure point concentration to assess residential risk. Although subsurface soil data is important for screening assessments (you need to know if high risk potential exist), the expected exposure scenario should be the same 0-1 feet that is used in the industrial worker scenario.

Also it appears that industrial soil RSLs were used to screen (Sect. 3.1, page 7 and Figure 4) but residential exposure was considered for the actual risk assessment. Please clarify.

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

"McKenna, Jim J Mr CIV USA AMC" <jim.mckenna@us.army.mil>

05/29/2009 02:07 PM

To: William Geiger/R3/USEPA/US@EPA, <jlcutler@deq.virginia.gov>, "Parks, Jeffrey N" <Jeffrey.Parks@shawgrp.com>

cc: "Llewellyn, Tim" <Tim.Llewellyn@arcadis-us.com>, <Timothy.Leahy@shawgrp.com>, <Tina_Devine@URSCorp.com>, "Meyer, Tom NAB02" <Tom.Meyer@usace.army.mil>, <diane.wisbeck@arcadis-us.com>, "jim spencer" <james_o_spencer@urscorp.com>, "Mendoza, Richard R Mr CIV USA IMCOM" <richard.r.mendoza@us.army.mil>, <jeremy.flint@atk.com>, <jerome.redder@atk.com>

Subject: draft agenda for June 23 and 24 2009 getting it together (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO

Will and Jim Cutler,

Thought that if we could get some feedback on the draft RFIs for AOC A, RAAP-047 by June 15 would be helpful, otherwise there would be little to talk about on these sites. Similarly feedback is needed for SWMU 31--I think we were waiting to hear back from Jim C. discussion with DEQ Roanoke about ground water monitoring.

Jeff Parks,

Please start preparing the draft agenda by soliciting input from URS and ARCADIS. I'd like to see an internal draft agenda by 10 June 2009.

URS & ARCADIS, please assist Jeff in this effort.

Thanks,
Jim

Classification: UNCLASSIFIED
Caveats: FOUO

DEPARTMENT OF THE ARMY
US ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND MD 21010-5403

MCHB-TS-REH

19 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-031: Area of Concern A – Nitrocellulose Rainwater Ditch, 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. Our previous comments have been addressed and we concur with the recommendation of clean closure with no further action.

2. 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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May 1, 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, Draft RFI Report, RAAP-031: Area of Concern A-Nitrocellulose Rainwater Ditch, 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 28, 2009. Also enclosed is the 28 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
Virginia Department of Environmental Quality
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019

09-815-73
JMcKenna

Concerning the following:

Radford Army Ammunition Plant
Draft RFI Report
RAAP-031: Area of Concern A-Nitrocellulose Rainwater Ditch
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

09-815-73
JMcKenna

Wisbeck, Diane

From: McKenna, Jim J Mr CIV USA AMC [jim.mckenna@us.army.mil]
Sent: Tuesday, April 28, 2009 10:39 AM
To: anne.greene@atk.com; ealohman@deq.virginia.gov; Druck, Dennis E Mr CIV USA MEDCOM CHPPM; Wisbeck, Diane; durwood willis2; Geiger.William@epamail.epa.gov; jerome.redder@atk.com; 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: AOC A-Nitrocellulose Rainwater Ditch draft RFI, Fed Ex Tracking Numbers (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:

Mr. James McKenna 796556541933
Mr. Richard Mendoza 796556546913
Ms. Susan Ryan 796556549143
Mr. Tom Meyer 797544299040
Mr. Dennis Druck 797544300827
Mr. James Cutler 796556557439
Ms. Elizabeth Lohman 797544308703
Mr. William Gieger 797544311982
Ms. Karen Sismour 797544320108

Classification: UNCLASSIFIED
Caveats: FOUO

FINAL

RFI Report

RAAP-031: Area of Concern A – Nitrocellulose Rainwater Ditch

Prepared for:
Radford Army Ammunition Plant

July 2009

Final RFI Report

RAAP-031:
Area of Concern A-Nitrocellulose Rainwater Ditch



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Senior Hydrogeologist



Diane D. Wisbeck
Deputy Project Manager



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Prepared for:
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Our Ref.:
GP08RAAP.0031

Date:
July 21, 2009

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Table of Contents

Executive Summary **1**

1. Introduction **1**

1.1 Project Scope and Objectives 1

1.2 Site Location and Description 1

1.3 Background 2

1.4 Site Conceptual Model 2

2. Investigation Activities **3**

2.1 Scope of Work 3

2.2 Field Methods 5

2.3 QA/QC 6

3. RFI investigation Results **7**

3.1 Soil Sampling Results 7

3.1.1 VOCs 7

3.1.2 SVOCs 7

3.1.3 Pesticides 9

3.1.4 PCBs 9

3.1.5 Explosives 10

3.1.6 Inorganics 10

3.2 Summary of Results 11

4. Fate and Transport **12**

5. Screening Level Risk Assessment **14**

5.1 Constituent Characterization 14

5.1.1 Data Evaluation 14

5.1.2 Sample Type 15

5.1.3 Evaluation of Data Qualifiers 15

5.1.4 Evaluation of Vertical and Spatial Data Distribution 17

5.2 Selection of Constituents of Potential Concern 17

5.3 Exposure Assessment 18

5.3.1 Potential Receptors 19

5.3.2 Exposure Parameters 19

5.3.3 Exposure Point Concentration 21

5.4 Toxicity Characterization 22

5.5 Human Health Risk Characterization 22

5.5.1 Hazard Quotient for Noncancer Hazard 22

5.5.2 Excess Lifetime Cancer Risk 23

5.6 Receptor-Specific Excess Lifetime Risk and Hazard Evaluation 23

5.6.1 Commercial/Industrial Worker Exposure to Surface Soil 23

5.6.2 Hypothetical Future Residential Exposure to Surface Soil 24

5.6.3 Hypothetical Future Residential Exposure to Combined Surface and Subsurface Soil 24

5.7 Uncertainty 25

5.8 Risk Assessment Summary 26

6. Conclusions and Recommendations 27

7. References 28

Tables

Table 3-1 Summary of Laboratory Analytical Data for Detected Organic Compounds in Soil

Table 3-2 Summary of Laboratory Analytical Data for Detected Inorganic Compounds in Soil

Table 5-1 Data Summary for Surface Soil (0-1 foot)

Table 5-2 Data Summary for Surface and Subsurface Soil (0-15 foot)

Table 5-3 Selection of Constituents of Potential Concern in Soil

Table 5-4 Summary of Toxicity Values and Target Sites

Table 5-5 Preliminary Risk and Hazard Estimates for Commercial/Industrial Worker Exposure to Surface Soil (0-1 foot)

Table 5-6 Preliminary Risk and Hazard Estimates for Hypothetical Future Residential Exposure to Surface Soil (0-1 foot)

Table 5-7 Preliminary Risk and Hazard Estimates for Hypothetical Future Residential Exposure to Combined Surface and Subsurface Soil (0-15 foot)

Table 5-8 Summary of Calculated Risks and Hazards

Figures

1 Site Location

2 RAAP-031 Location

3 Soil Sample Locations

4 Constituents in Soil Greater than Screening Levels

Appendices

A – Soil Sampling Logs

B – Data Validation Report

C – Laboratory Reports

D – Analytical Data

Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
bgs	below ground surface
CERCLA	Comprehensive Environmental Response and Compensation Liability Act
COPCs	constituents of potential concern
DNT	dinitrotoluene
ELCR	excess lifetime cancer risk
EPC	exposure point concentration
ft	feet
HI	hazard index
HQ	hazard quotient
HWMU	Hazardous Waste Management Unit
Mg/kg	milligram per kilogram
MMA	Main Manufacturing Area
NRU	New River Unit
PAH	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
QAPA	Quality Assurance Plan Addendum
QA/QC	Quality Assurance/Quality Control
RBC	Risk-Based Concentrations
RCRA	Resource Conservation and Recovery Act
RFAAP	Radford Army Ammunition Plant
RFI	RCRA Facility Investigation
RSLs	Regional Screening Levels
SCS	Soil Conservation Service
SLHHRA	Screening Level Human Health Risk Assessment
SSL	Soil Screening Level
SSP	Site Screening Process
SVOCs	semivolatile organic compounds
TAL	Target Analyte List
TCL	Target Compound List
UCL	upper confidence limit
UTL	Upper Tolerance Level
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

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-031 (AOC A – Nitrocellulose Rainwater Ditch). Site investigations conducted in 2003 and 2006 identified the presence of 2,4- dinitrotoluene (DNT), Aroclor-1254, and arsenic in soil at concentrations greater than health-based screening levels. The results from these investigations were presented in a Site Screening Process (SSP) Report (URS, 2007) and an RFI was recommended. RFI field investigations were conducted in June and December 2008. Sampling was designed to verify the presence of 2,4- DNT and 2,6-DNT in surface soil at previously sampled locations and to delineate the horizontal and vertical extent of constituents in soil.

2,4-DNT, 2,6-DNT, and DNT mix were detected in 2008 above screening levels in the surface samples collected from the two soil borings (ASB3 and ASB5) with previous detections. However, concentrations were less than the screening levels in the soil samples collected from the delineation locations, indicating DNT is limited the immediate vicinity of ASB3 and ASB5, an area of approximately 100 square feet at the north end of the concrete stormwater conveyance. Similarly, Aroclor-1254 and iron were detected at or marginally above industrial screening levels in a very small area which is currently covered by concrete. Because this area is capped with a concrete surface water conveyance, mobilization of these compounds is not considered to be a concern. Furthermore these compounds were not detected in the samples collected at greater depths confirming that vertical transport is not occurring. In addition, the levels of metals present in soil are consistent with background levels at Radford Army Ammunition Plant.

There are no current future development plans for RAAP-031 (AOC A) and active industrial operations are expected to remain at the site. The results of the screening level human health risk assessment indicate that the observed levels of constituents in soil do not pose an unacceptable risk to either current commercial/industrial workers or to hypothetical future residents. Based on the data presented in this report, clean closure with no further action is recommended for RAAP-031 (AOC A).

1. Introduction

ARCADIS U.S, Inc. (ARCADIS) has been retained by the United States Army Environmental Command to perform Installation Restoration Program activities at RFAAP, located in Radford Virginia (**Figure 1**). This work in being conducted under a performance based contract that encompasses 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 addresses RAAP-031 (AOC A – Nitrocellulose Rainwater Ditch) located within the Main Manufacturing Area of RFAAP.

1.1 Project Scope and Objectives

The purpose of this RFI Report is to present the results of field investigations, risk assessments, and the resulting conclusions for RAAP-031 (AOC A). Field investigation activities discussed in this report were conducted in 2003, 2006, and 2008.

The results of the 2003 and 2006 (URS, 2007) sampling identified the presence of 2,4-DNT, Aroclor-1254, and arsenic at concentrations greater than screening levels used at that time (Region 3 Risk-Based Concentrations [RBCs]). Based on those results, an RFI was recommended to delineate constituents in soil. A work plan was developed to address this recommendation and associated fieldwork was conducted in June and December 2008 by ARCADIS. The work was designed to:

- Verify the presence of 2,4- DNT and 2,6-DNT in surface soil at previously sampled locations ASB5A and ASB3A; and

- Delineate the horizontal and vertical extent of previous detected constituents in soil.

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), located about 6 miles apart. RAAP-031 is located in the MMA, an active ammunition production facility that straddles the Pulaski and County 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-031 is located within the South Bank Area, within an active industrial portion of the plant.

AOC A, located directly east of the mix house (Building 1508) driveway, is a former unlined ditch less than a twentieth of an acre in size now (**Figure 2).** The ditch was converted to an open concrete culvert approximately 3.5 feet (ft) wide. To the east of the ditch is a steep grassy slope with numerous utility poles and support structures.

1.3 Background

The AOC was initially identified as an area of discolored soil by United States Environmental Protection Agency (USEPA) personnel during the 1987 Visual Site Inspection visit. In 2002 a second visit occurred and revealed that a concrete culvert had been constructed to contain and convey rainwater to the storm water system. Access to the area is tightly controlled, due to the nature of operations in Building 1508.

1.4 Site Conceptual Model

AOC-A is located in the south bank area of the MMA. As such surface and groundwater flow paths are generally northerly towards the New River where it flows west to east between the South Bank Area and the Horseshoe Area to the north. More than 35 ft of unconsolidated soils overlie the carbonate bedrock in this area. Unison-urban land complex soils are present in this area and most of the South Bank Area (SCS, 1985). As described in the site screening report the immediate subsurface materials at this location are composed of sandy silt and clay with interbedded silty sand with coarser deposits at depth. This stratigraphy has been confirmed by soil borings in the adjoining area conducted by ARCADIS is 2008.

AOC-A is a concrete lined surface runoff conveyance approximately 3.5 ft wide and 130 ft long, leading towards an inlet to the site storm water system. The former ditch lies between a grassy slope with overhead process lines, and a flat paved driveway used to access the adjacent building. The approximately conveyance parallels the 1,790 foot mean sea level elevation contour. The depth to groundwater is between 23 and 28 ft below ground surface (bgs).

2. Investigation Activities

RAAP-031 was investigated in 2003 and 2006 as part of a RCRA SSP (URS, 2007). This report summarized previous investigation results and presents the investigational activities that have been conducted since the SSP.

2.1 Scope of Work

RAAP-031 has undergone several phase of investigation. All sample locations from the 2003, 2006, June 2008, and December 2008 field events are shown on **Figure 3**. Three soil borings (ASB1 through ASB3) were advanced during the first phase of investigation in October 2003:

- ASB1 was advanced adjacent to the concrete swale to the depth of groundwater (32 ft bgs). Soil samples were collected from surface (0 to 1 ft bgs), intermediate (10 to 12 ft bgs), and terminal (26 to 28 ft bgs) intervals.

- ASB2 was advanced adjacent to the concrete swale to the depth of groundwater (24 ft bgs). Soil samples were collected from surface (0 to 1 ft bgs), intermediate (10 to 12 ft bgs), and terminal (21 to 23 ft bgs) intervals.

- ASB3 was advanced adjacent to the concrete swale to refusal (14.7 ft bgs). Soil samples were collected from surface (0 to 1 ft bgs), intermediate (6 to 8 ft bgs), and terminal (13 to 14.7 ft bgs) intervals.

In April 2006, two additional soil borings (ASB4 and ASB5) were completed to evaluate for the presence or absence of constituents in surface soil and subsurface soil:

- ASB4 was advanced in the center of the concrete swale to the depth of groundwater (32 ft bgs). Samples were collected from surface (0 to 1 ft bgs), intermediate (10 to 11 ft bgs), and terminal (20 ft bgs) intervals.

- ASB5 was advanced at the terminus of the concrete swale. Due to overhead piping, boring ASB5 was advanced using a hand-auger. Samples were collected from surface (0 to 1 ft bgs) and intermediate (7 ft bgs) intervals.

Samples collected were submitted to be analyzed for Target Compound List (TCL) Volatile Organic Compounds (VOCs); TCL Semivolatile Organic Compounds (SVOCs); Polycyclic Aromatic Hydrocarbons (PAHs); explosives; and Target Analyte List (TAL)

inorganics. The surface sample from ASB2 and all samples collected from ASB4 and ASB5 were also analyzed for TCL Polychlorinated Biphenyls (PCBs), TCL Herbicides, and TCL Pesticides, Samples ASB1 (22 to 24 ft bgs) and ASB2 (14 to 16 ft bgs) were analyzed site specific physical soil testing data.

Additional work was conducted by ARCADIS in June and December 2008 to supplement the data previously collected at AOC-A and complete the source area characterization and impact delineation.

In June 2008, 12 samples were collected from seven locations in accordance with Work Plan Addendum 26 (ARCADIS, 2008a):

- Surface soil samples (0 to 1 ft bgs) were collected adjacent to the concrete swale at ASB3 and ASB5 for confirmation of previous detections.

- Surface (0 to 1 ft bgs) and subsurface (5 to 6 ft bgs) were collected at ASB6 and ASB7 to provide delineation samples east of ASB3.

- Surface (0 to 1 ft bgs) and subsurface (5 to 6 ft bgs) were collected at ASB8, ASB9, and ASB10 to provide delineation down-slope from ASB5.

Samples were submitted to Empirical Laboratories to be analyzed for SVOCs using USEPA Method 8270C, PCBs using USEPA Method 8082, and inorganics using USEPA Method 6010.

In December 2008, ARCADIS collected an additional 21 samples from 11 locations in accordance with Work Plan Addendum 29 (ARCADIS, 2008b):

- Surface (0 to 1 ft bgs) and subsurface (5 to 6 ft bgs) soil samples were collected beneath the concrete at locations ASB3A and ASB4A to assess the condition of soil underneath the swale and to provide delineation to the west of ASB3 and ASB4, respectively.

- A surface (0 to 1 ft bgs) soil sample was collected at ASB11 to provide down-slope delineation of ASB9.

- Surface (1 to 2 ft bgs, due to gravel fill from 0 to 1 ft bgs) and subsurface (5 to 6 ft bgs) soil samples were collected at ASB12 to provide delineation to the east and west of ASB5 and the ditch terminus.

- Surface (0 to 1 ft bgs) and subsurface (5 to 6 ft bgs) soil samples were collected at ASB13 to provide delineation to the east and west of ASB5 and the ditch terminus.

- Surface (0 to 1 ft bgs or directly below fill material) and subsurface (5 to 6 ft bgs) soil samples were collected at ASB14, ASB15, ASB 16, and ASB17 to provide delineation around ASB3. ASB14 and ASB 17 were collected beneath the concrete swale.

- Surface (0 to 1 ft bgs) and subsurface (5 to 6 ft bgs) soil samples were collected through the concrete at ASB18 and ASB19 to assess the condition of soil underneath the concrete swale and to provide horizontal delineation of the concrete stormwater conveyance.

With the exception of the sample collected from ASB11, samples were submitted to Empirical Laboratories to be analyzed for PCBs by USEPA Method 8082 and 2,4-DNT, 2,6-DNT, and DNT mix by USEPA Method 8270C. The surface sample collected from location ASB11 was submitted for PCB analysis only.

2.2 Field Methods

Soil sampling events were conducted in 2003 and 2006 field events by URS, in accordance with the RFAAP Master Work Plan (URS, 2003). With the exception of the surface and subsurface soil samples collected at location ASB5, soil samples during these events were collected using direct push sample collection methodology. The samples at ASB5 were collected using a hand auger because of overhead utilities. Concrete coring was completed prior to sampling at locations ASB3A, ASB4A, ASB15, ASB17, ASB18, and ASB19 to access the soil beneath the ditch. Surface soil samples collected from locations ASB3A, ASB4A, ASB13, ASB16, ASB17, ASB18, and ASB19 were collected using a hand auger to increase recovery volume. Both the surface and subsurface samples collected from location ASB14 were collected using a hand auger due to limited overhead access. The remaining samples were collected using Geoprobe™ and macrocore direct push sampling equipment.

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. Boring logs are provided in Appendix A.

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 and the Quality Assurance Plan Addendum (QAPA). Field QC samples included field duplicates, field blanks, and trip blanks. All samples collected in 2008 were analyzed by Empirical Laboratories, LLC located in Nashville, TN. Data was validated in accordance with the QAPA. Based on the data review only results for benzaldehyde were qualified as rejected due to poor accuracy in recovery of the compound. Benzaldehyde is a common poor-performer and its poor recovery does not indicate significant technical deficiencies with analytical procedures used in this study. 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. Some values were qualified as estimated due to minor QC deficiencies. 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 in Appendix B and C, respectively.

3. RFI investigation Results

This section presents the field observations and results of laboratory analysis of surface and subsurface soil samples collected during the RFI field investigations in 2003, 2006, and June and December 2008. Laboratory analytical results were compared to health-based screening levels as a comparison. Soil analytical results were compared to the adjusted industrial soil Regional Screening Levels (RSLs) and Soil to Groundwater Soil Screening Levels adjusted to dilution attenuation factor of 20 (SSL-DAF 20) (USEPA, September 2008a), and to the 95 percent Upper Tolerance Levels (95% UTLs) established for naturally occurring metals in soils at the facility (IT, 2001).

3.1 Soil Sampling Results

Soil samples were collected at 21 locations (**Figure 3**). **Tables 3-1** and **3-2** present the screening levels and the results for those analytes that were detected in at least one of the soil samples. Analytes detected at concentrations greater than the industrial soil RSLs and/or soil to groundwater SSL are shown on **Figure 4**. A complete set of analytic results is included as Appendix D. This section presents the detected concentrations by analyte group.

3.1.1 VOCs

Soil samples collected in 2003 and 2006 were submitted for VOC analysis by USEPA Method 8260. With the exception of methylene chloride, no VOCs were detected. Methylene chloride was detected at concentrations greater than the industrial soil RSL in the six soil samples collected in 2006, as well as the associated blank. The presence of methylene chloride is likely due to laboratory contamination, and is therefore not considered site-related.

3.1.2 SVOCs

Soil samples collected in 2003, 2006, and 2008 were analyzed for SVOCs using USEPA Method 8270C. Six constituents (2,4-DNT, 2,6-DNT, di-n-butyl phthalate, DNT mix, benzo(a)anthracene, N-nitroso-di-n-phenylamine) were detected at concentrations greater than their soil to groundwater SSLs; three constituents had concentrations greater than the industrial soil RSL (benzo(a)anthracence, dibenzo(a)anthracene, and DNT Mix).

- ASB3 and vicinity: ASB3 is located in the north end of the concrete lined ditch (Figure 3). 2,4-DNT and 2,6-DNT were detected in the surface soil collected from

ASB3 in 2003, and the confirmation surface sample collected in June 2008. Detected concentrations were greater than the soil to groundwater SSL (1.36 mg/kg) but below the industrial soil RSL (120 mg/kg). DNT mix was also detected in concentrations greater than the industrial RSL in both of these samples. DNTs were not detected in concentrations greater than the screening levels in the subsurface samples (6 to 8 ft bgs and 13 to 14.7 ft bgs) collected at this location.

To provide delineation to the east of ASB3 soil boring ASB7 and ASB8 were advanced in June 2008. DNTs were detected in concentrations above the groundwater SSLs. In December 2008 soil borings ASB14, ASB15, ASB16, and ASB17 were advanced adjacent to the concrete swell to provide further horizontal delineation in the area of ASB3. Soil boring ASB3A was also advanced in December 2008 through the concrete. DNT mix was detected in the surface sample collected from location ASB14 at a concentration greater than the soil to groundwater SSL, but less than the industrial soil RSL; however the concentration of 2,4-DNT and 2,6,DNT were below both screening levels. With the exception of the surface sample collected at ASB14, DNTs were not detected in the samples collected from these locations, indicating the affected soil is limited to surface soils in the immediate vicinity of ASB3.

Di-n-butylphthalate was detected in the confirmation surface soil sample collected at ASB3 in 2008 a concentration greater than the groundwater SSL (220 mg/kg) but lower than the industrial soil RSL (6,200 mg/kg). Di-n-butylphthalate was not detected in the previous soil sample at locations ASB3 at a concentration greater than the screening levels. N-Nitrosodiphenylamine was detected in the surface soil sample collected from ASB3 in 2006 as well as the 2008 sample at concentrations greater than the soil to groundwater SSL (3.4 mg/kg) but less than the industrial soil RSL (350 mg/kg). N-Nitrosodiphenylamine was not detected in the sample taken from ASB3A, indicating a limited area of affected soil.

- ASB5 and vicinity: ASB5 is located in the north of the concrete lined ditch (Figure 3). 2,4-DNT was detected in the surface soil samples collected from location ASB5 in 2006 and 2008 concentrations greater than the soil to groundwater SSL but below the industrial soil RSL. DNT mix was detected at a concentration greater than the industrial RSL in both of these samples. DNTs were not detected in the subsurface sample (7 ft bgs). In June 2008, soil borings ASB9, ASB10, and ASB11 were advanced down-gradient of ASB-5 to provide delineation of the previous detections. DNTs were not detected in these samples. In December 2008 soil borings ASB12 and ASB13 were advanced to the east and west of ASB5 to further bound previous detections. DNTs were not detected in either of these samples, indicating DNT concentrations are limited to the surface soil immediately

surrounding location ASB5.

Benzo(a)pyrene and dibenzo(a,h)anthracene were detected in the 2008 surface sample at ASB5. Concentrations were greater than the soil to groundwater SSL (6.2 mg/kg and 0.3 mg/kg, respectively) and industrial soil RSL (0.2mg/kg and 0.2 mg/kg). Neither constituent had previously been detected at concentrations above the screening levels, nor was it detected in any other sample collected in 2008.

3.1.3 Pesticides

Soil samples collected in 2006 were submitted and analyzed for TCL Pesticides. Dieldrin was detected in the surface and subsurface samples collected at ASB4 in 2006 at concentrations less than the industrial soil RSL (0.11 mg/kg), but greater than the soil to groundwater SSL-DAF20 (0.0018 mg/kg). Dieldrin was not detected in any other samples and no other pesticides were detected.

3.1.4 PCBs

Soil samples collected in 2003 and 2006 were submitted for PCB analysis by USEPA Method 8082. Aroclor-1254 was the only PCB detected in soil samples. The results are summarized below.

- ASB3 and vicinity: Samples collected from ASB3 (Figure 3) during the 2003 sampling event were not analyzed for PCBs. Surface soil (0 to 1 ft bgs) was collected from this location in June 2008 and analyzed for PCBs. Aroclor 1254 was detected at a concentration of greater than the soil to groundwater SSL and industrial soil RSL.

  In December 2008 samples were collected from ASB3A, ASB14, ASB15, ASB16, and ASB17 (Figure 3) to delineate PCBs in soil. Samples at each location were collected at the 0 to 1 ft bgs and 5 to 6 ft bgs intervals. No PCBs were detected at any of these locations indicating PCBs are limited to the shallow soils in the immediate vicinity of ASB3.

- ASB5 and vicinity: To confirm PCB detections observed at ASB5 (Figure 3) during the 2006 field event, surface soil (0 to 1 ft bgs) was collected at this location in July 2008. Aroclor-1254 was detected at a concentration greater than the soil to groundwater SSL industrial soil RSL.

  In June 2008 samples were collected from locations ASB8, ASB9, and ASB10 (Figure 3) to provide down-gradient delineation of ASB5. Samples at each location

were collected at the 0 to 1 ft bgs and 5 to 6 ft bgs intervals. Aroclor 1254 was detected in the surface sample collected at ASB9 at a concentration is less than the quantification limit. PCBs were not detected in any of the other samples indicated the affected soil is limited to the area immediately around ASB5.

In December 2008, a surface soil sample (0 to 1 ft bgs) was collected from ASB11 (Figure 3) to provide further down-gradient delineation of ASB5. Surface and subsurface samples were collected from ASB12 and ASB13 (Figure 4) to provide delineation to the east and west of ASB5. No PCBs were detected at any of these locations indicating PCBs are limited to the shallow soils in the immediate vicinity of ASB5.

- South end of ditch: In December 2008 soil borings ASB19 and ASB18 were advanced through the concrete in the south end of the conveyance to assess the soils beneath the ditch and to provide complete coverage of the ditch. Samples were collected from the 0 to 1 ft bgs and 5 to 6 ft bgs intervals. No PCBs were detected in these samples indicating PCB concentrations are limited to the immediate vicinities of ASB3 and ASB5.

3.1.5 Explosives

Soil samples collected in 2003 and 2006 were analyzed using both USEPA SW-846 Method 8330 (explosives) USEPA Method 8270C (SVOCs). Compounds 2,4-DNT and 2,6-DNT were both detected by these methods. However, USEPA Method 8270C provides lower reporting limits and more reliable detection method; therefore results of the 8330 analysis are not discussed in this RFI. All additional samples collected in 2008 were analyzed using the SVOC method (USEPA Method 8270C).

3.1.6 Inorganics

Samples collected during the 2003, 2006, and June 2008 investigations were analyzed for inorganics. Arsenic was detected above the industrial soil RSL (1.6 mg/kg) in most of the soil samples, however only one concentration, reported in the surface sample collected from location ASB5 in 2006, was greater than the background 95% UTL (15.8 mg/kg). Surface soil at ASB5 was resampled in June 2008 and the concentration of arsenic was less the background 95% UTL. Cobalt and manganese were also detected at concentrations greater than the industrial soil RSL (30 mg/kg and 2,300 mg/kg, respectively); however, concentrations were less than the background 95% UTL (72.3 mg/kg and 2,543 mg/kg), and therefore, are not site-related.

3.2 Summary of Results

Soil samples were collected during the July and December 2008 investigations to verify and delineate the horizontal and vertical extent of previous detected constituents in soil. The following analytical results were observed.

- 2,4-DNT, 2,6-DNT, and DNT mix were detected above screening levels in the surface samples collected from ASB3 and ASB5 in 2006 and 2008. Concentrations were less than the screening levels at the delineation samples collected from locations ASB12 through ASB17.

- Aroclor-1254 was also detected in the surface soil sample collected from ASB3 and ASB5 during the 2006 field event at a concentration greater than the industrial soil SSL however PCBs were not detected in the delineation samples collected at locations ASB6 through ASB10 or ASB11 through ASB19.

- These data indicate DNT and PCB concentrations are limited to surface soils in the immediate vicinity of ASB3 and ASB5. Constituents were not detected in the samples collected at greater depths confirming that vertical transport to groundwater is not occurring.

4. Fate and Transport

The fate and transport of site constituents depend upon the physical conditions at the site, the physical and chemical characteristics of the constituents, and the nature and extent of the constituent release. This section evaluates the potential for constituents detected in soil to affect groundwater. This screening level evaluation was conducted based on a comparison of detected concentration to USEPA (2008) Regional Soil Screening Levels (SSL) for the protection of groundwater pathway adjusted to reflect a Dilution Attenuation Factor of 20. This comparison is presented in **Table 3-1**.

As seen in **Table 3-1**, and summarized herein, the following constituents were detected in soil above the SSLs. The SSLs are based on an infinite source model and a default 0.5 acres source area. It should be noted that the area containing constituents above industrial SSLs is an estimated 45 square ft in the vicinity of ASB3 and 40 square ft (0.001 acres) in the vicinity of ASB5, thus the application of SSLs at this site may be overly conservative. The following compounds were detected at concentrations greater than the SSLs.

- The compounds 2,4- and 2,6-DNT were detected in historical and recent surface soil samples collected at ASB3 and ASB5 at concentrations greater than the SSLs. The concentrations of both compounds, as well and the combined DNT concentration (DNT mix), were less than the RSLs in the deeper sample at both locations.

- Aroclor-1254 was detected at concentrations greater than the SSL in surface soil samples (0 to 1 ft bgs) collected at ASB3, ASB5, and ASB9. However, the concentration of Aroclor-1254 in ASB3 and ASB9 were both less than the soil to groundwater SSL. The concentration of Aroclor-1254 (0.16 mg/kg) in the deep sample at ASB5 (7 ft bgs) was slightly greater than the SSL (0.10 mg/kg).

- Dieldrin was detected at a concentration greater than the SSL (0.0018 mg/kg) in both the surface (0.014 mg/kg) and deeper soil sample (0.0046 mg/kg) at ASB4 in 2006. These detected concentrations are both less than the quantification limit (0.025 mg/kg) and thus are estimated concentrations. Dieldrin was not detected in any other sample.

The only constituents greater than the soil to groundwater screening levels are located underneath the concrete stormwater conveyance and therefore are protected from infiltrating water. With the exception of ASB5, soil samples collected at greater than 5 ft bgs from the sample locations where surficial detections have occurred indicate that

deeper soils are not affected. This indicates that infiltration is limited and the constituents themselves are generally immobile in the subsurface.

5. Screening Level Risk Assessment

This section presents a Screening Level Human Health Risk Assessment (SLHHRA) for AOC A. The purpose of this risk assessment is to evaluate the potential current and future risks and potential hazards to human health associated with constituents detected in surface and subsurface soil along the nitrocellulose ditch in AOC A. Given the small area of the site, approximately 1,964 ft^2 (0.045 acres), and single medium of concern (i.e., soil), a SLHHRA was performed. The SLHHRA follows USEPA guidance for selecting constituents of Potential Concern (COPCs) (USEPA, 1989, 1993) and calculating the exposure point concentrations (EPCs) (USEPA, 1989, 2002a, 2007). However, instead of a formal exposure and toxicity characterization, a risk ratio method of comparison to the USEPA RSLs is performed. Ratios between the constituent concentrations and readily available health-based RSLs for residential and industrial land use were calculated to estimate potential risks and hazards. The relative risks and hazards were summed to estimate the cumulative risks and hazards for the current and reasonably anticipated future industrial and hypothetical future residential land uses.

A screening level ecological risk assessment was not conducted for AOC A due to the relatively small area (0.045 acres) and lack of habitat. AOC A is a concrete lined drainage ditch within an industrialized area; therefore, there is virtually no habitat available for use at AOC A. In addition, AOC A is located within the industrialized area of the base. Therefore, no habitat is available and potential exposure to soil by terrestrial and avian receptors would be minimal. Because of the nature of the site and surrounding area, it is concluded that AOC A does not provide a sufficient or suitable habitat for ecological receptors. Therefore, no further evaluation of ecological risk was performed.

5.1 Constituent Characterization

A total of 23 surface and 24 subsurface soil samples were have been collected. All data were used in the SLHHRA.

5.1.1 Data Evaluation

The data were evaluated as outlined below to identify the datasets to be used in the human health risk assessment.

5.1.2 Sample Type

The following criteria were employed to determine whether a particular sample result is usable for risk assessment purposes:

- All soil samples were considered usable for the risk assessment regardless of date collected.

- Analytical results from soil samples collected from different depths at the same sampling location during the same sampling event were evaluated as independent samples.

- Analytical results from soil samples collected from the same sampling location during different sampling events (confirmation samples) were evaluated as independent samples.

- Analytical results from duplicate samples collected from the same sampling location during the same sampling event were generally considered usable for risk assessment. During statistical analysis of the data, duplicate samples were treated as follows. Where a chemical was detected in both the original sample and the duplicate sample, the results were averaged. 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 (without averaging). If a chemical was not detected in either the original sample or the duplicate sample, then the lowest 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 was 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 detection method was used.

5.1.3 Evaluation of Data Qualifiers

The following criteria were employed to determine whether a particular sample result is usable for risk assessment purposes:

- Sample results rejected during data validation were not considered usable for risk assessment. These data, indicated by an "R" data qualifier, would have been eliminated from the dataset. Only one compound, benzaldehyde, was qualified "R" due to poor spike recovery. Benzaldehyde is typically a poor performer and does reflect laboratory technical performance deficiencies. Benzaldehyde was recently appended to the USEPA's Contract Laboratory Program Target Compounds List. However, is not expected to be present on site.

- Tentatively identified compounds (TICs) are generally not considered usable for risk assessment unless the compound is also included as a standard analyte in the QAPP, or there are adequate toxicity data available to assess potential risks. There were relatively few TICs identified, and the concentrations were low, generally less than 1 mg/kg. Therefore, following USPEA (1989) guidance, TICs, were not quantitatively evaluated this risk assessment.

- N – identification of analyte is not confirmed and is considered presumptive. Only TICs were qualified "N", therefore, no additional data were excluded from the analysis as a result of this qualification.

Laboratory-qualified data with the following data qualifiers were retained within the dataset:

- L, K, J – concentration is estimated (L – biased low; K – biased high)

- B – for organic chemicals, analyte was also detected in the blank, and for metals, analyte concentration is estimated

- D – a secondary dilution was required prior to analysis

- E – concentration exceeds the calibration range of the instrument and represents the maximum possible concentration. Bis(2-ethylhexyl)phthalate and 2,6- DNT in historical sample ASB3 (0-1) were qualified "E" by the laboratory. However, the data validation concluded that the exceedance of the calibration range was not significant, and thus applied a final qualifier of "J" indicating that the data were considered estimated. Therefore, these data were used quantitatively in the risk assessment. In addition, during the recent sampling event, a confirmation sample was collected at location ASB3 (0-1) and the results were similar to previously detected concentration, confirming both their presence and reported concentrations.

- U – the analyte was not detected at the reporting limit.

5.1.4 Evaluation of Vertical and Spatial Data Distribution

Site soil data are usually subdivided into "risk-assessment datasets" based on vertical and spatial distribution for the various exposure scenarios. Soil data was subdivided vertically to generate both a surface soil and surface and combined subsurface soil datasets.

- Surface soil, soil samples collected from depths of 0 to 1 foot bgs, was used to evaluate both the commercial/industrial worker and the hypothetical future residential exposure scenarios.

- Combined surface and subsurface soil analytical results from samples collected at depths of 0 to 15 ft bgs (corresponding to typical excavation depths in the region) were used in a second analysis of the hypothetical future residential exposure scenario, assuming that subsurface soil could be brought to the surface during redevelopment.

5.2 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, the minimum and maximum detected concentration, and the EPC. Surface soil and surface and subsurface soil risk assessment data sets are summarized in **Table 5-1** and **Table 5-2**, respectively.

The objective of the COPCs 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 SLHHRA on those constituents present as a result of past activities at the site and to be of potential concern to human health. The maximum detected concentration of a constituent was compared to the USEPA Regional Screening Levels (RSLs; USEPA, 2008).

Both residential and industrial soil RSLs were used in the selection of COPCs to allow for COPCs for specific receptors. RSLs based on non-cancer effects were adjusted by

a factor of 0.1 to account for cumulative effects following USEPA (1993) Region 3 guidance. Maximum concentrations in soil to a depth of 15 ft bgs were compared to both residential and industrial RSLs. Constituents present at concentrations greater than the RSLs that were not essential nutrients or those without an identified RSL were considered COPCs for that exposure pathway. The COPC selection is presented in **Table 5-3** for soil.

The COPCs for soil by data set and scenario are:

- Surface soil exposure for the current commercial/industrial worker and future hypothetical resident

Dinitrotoluene mixture; Aroclor 1254; benzo(a)pyrene; dibenzo(a,h)anthracene; indeno(1,2,3)pyrene; dimethylphthalate; di-n-octylphthalate; arsenic; cobalt; and manganese. (Note, although arsenic, cobalt and manganese were detected within background concentrations, they were carried forward in the SLHHRA to evaluate cumulative risks. Their contribution to the cumulative risk is discussed in Section 5.6).

- Surface and combined surface and subsurface soil exposure for the hypothetical future residential scenario under a redevelopment scenario

2,4-DNT; dinitrotoluene mixture; Aroclor 1254; benzo(a)anthracene; benzo(b)fluoranthene; benzo(a)pyrene; dibenzo(a,h)anthracene; indeno(1,2,3)pyrene; dimethylphthalate; di-n-octylphthalate; aluminum; arsenic; chromium; cobalt; copper; iron; manganese; and vanadium. (Note, although arsenic, cobalt, manganese, and vanadium were detected within background concentrations, they were carried forward in the SLHHRA to evaluate cumulative risks. Their contribution to the cumulative risk is discussed in Section 5.6).

5.3 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 possible points where human receptors may contact affected media under current or potential future conditions 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

contaminated medium (the exposure point); and (4) an exposure route at the exposure point. The purpose of the exposure assessment is to estimate the ways 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 usually is 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.

5.3.1 Potential Receptors

AOC A is a 0.045-acre (1,964 ft^2) area consisting of a shallow concrete ditch approximately two-ft wide flanked by concrete berms located between a paved driveway and the base of a grassy bank. The site lies in a relatively flat area. The majority of the area is paved, so the inclusion of soil samples collected from beneath the pavement for current exposures is conservative because the pavement will act as a barrier to exposure. Under the current land-use exposure to COPCs in soil by industrial workers could occur. Hypothetical future exposure of residential receptors under two scenarios also was considered. One future hypothetical residential scenario considered exposure to surface soil only, assuming no change in site conditions. A second scenario considering redevelopment of the site was also evaluated. Under redevelopment, it was assumed that subsurface soils could be exposed or brought to the surface and thus, exposure to combined surface and subsurface soil was evaluated.

5.3.2 Exposure Parameters

This SLHHRA relies on the RSLs developed by the USEPA (2008) to evaluate exposure. The exposure assumptions used to derive the RSLs are provided in the following subsections.

5.3.2.1 Industrial Worker

An industrial worker may be exposed to site-related constituents in soil through incidental ingestion, dermal contact and/or inhalation of particulates. Inhalation of vapors is not a complete pathway as none of the COPCs identified are considered to be volatile (i.e., Henry's Law constants of 1 $x10^{-5}$ atm-m^3/mole or greater with a molecular weight of less than 200 g/mole). These exposure pathways are consistent with those used to derive the RSLs. The exposure assumptions for this receptor are:

- Adult body weight of 70 kilograms (kg);
- Exposure duration of 25 years;
- Exposure frequency of 250 days per year;
- Soil ingestion rate of 100 milligrams per day (mg/day);
- Skin surface area of 3,300 square centimeters (cm^2);
- Dermal adherence factor of 0.2 milligrams per square centimeter (mg/cm^2);
- Particulate emission factor of 1.36 x 109 m^3/kg; and
- Exposure time of 8 hours per day.

5.3.2.2 Adult and Child Resident

If AOC A were redeveloped for residential uses, hypothetical future adult and child residents could be exposed to site-related constituents through contact with soil through incidental ingestion, dermal contact and/or inhalation of particulates. The potential exposure pathways at AOC A are consistent with those used to derive the RSLs. For noncarcinogens, the soil RSLs were derived based on exposure of a young child while the RSLs for potential carcinogens are based on an age-adjusted exposure. In addition, three COPCs identified in soil [benzo(a)pyrene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] are considered to be mutagens , and therefore, require additional consideration by age. The exposure assumptions for the child receptor are:

- Body weight of 15 kg;
- Exposure duration of 6 years;
- Exposure frequency of 350 days per year;
- Soil ingestion rate of 200 mg/day;
- Skin surface area of 2,800 cm^2;
- Dermal adherence factor of 0.2 mg/cm^2;
- Particulate emission factor of 1.36 x 109 m^3/kg; and

- Exposure time of 24 hours per day.

The exposure assumptions for the combined adult and child receptor are:

- Age-adjusted soil ingestion rate of 114 milligrams-year per kilogram-day (mg-year/kg-day);
- Age-adjusted dermal contact factor of 361 mg-year/kg-day;
- Exposure time of 24 hours per day;
- Exposure duration of 30 years;
- Particulate emission factor of 1.36 x 109 m^3/kg; and
- Exposure frequency of 350 days per year.

The exposure assumptions for the mutagens are:

- Age-adjusted soil ingestion rate of 489.5 mg-year/kg-day;
- Age-adjusted dermal contact factor of 1,445 mg-year/kg-day;
- Exposure time of 24 hours per day;
- Exposure duration of 30 years;
- Particulate emission factor of 1.36 x 109 m^3/kg; and
- Exposure frequency of 350 days per year.

5.3.3 Exposure Point Concentration

The EPC is the representative concentration of a constituent in an environmental medium that is potentially contacted by the receptor (USEPA, 1989). The EPC 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 was not underestimated, the upper confidence limit on the mean (UCL) concentration was used as an estimate of the EPC (USEPA, 1989; 2002a). 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

datasets were not of sufficient sample size and/or the frequency of detection was small, which precluded the estimation of the UCL via ProUCL4.0. EPCs were presented with the soil risk assessment dataset in **Tables 5-1** (surface) and **5-2** (combined surface and subsurface).

5.4 Toxicity Characterization

The toxicity values used to calculate the RSLs are provided in USEPA (2008). No additional toxicity characterization was performed. Toxicity values used to calculate the RSLs are summarized on Table 5-4. In addition, target sites and/or critical effects are summarized.

5.5 Human Health 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.

5.5.1 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 exposure dose 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 are not expected to occur, an HQ greater than 1 does not imply that health effects will occur, but that health effects are potentially 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, 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).

5.5.2 Excess Lifetime Cancer Risk

The ELCR is an estimate of the 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 intakes for each constituent are averaged over the hypothesized 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 exposure dose and the cancer slope 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 risk estimate is compared to USEPA's target risk range is from $1x10^{-4}$ to $1x10^{-6}$.

5.6 Receptor-Specific Excess Lifetime Risk and Hazard Evaluation

Risk estimates were calculated based on USEPA default exposure assumptions and toxicity values using the EPCs for the COPCs and the RSLs for both the residential and industrial scenario. For non carcinogens, the EPC was divided by the RSL to estimate a preliminary constituent-specific HQ. HQs were summed to get an HI) for the receptor. For carcinogens, the EPC was divided by the RSL and multiplied by $1x10^{-6}$ to estimate a preliminary constituent-specific ELCR. Constituent-specific ELCRs were summed to get a total ELCR for the receptor. Where the total HI exceeded one, target organ specific HI were calculated. Arsenic is a COPC, but its EPC is less than background; as a result, risk and hazard calculations excluding arsenic as a COPC were also prepared and are discussed below.

The preliminary risk evaluations are presented in **Tables 5-5, 5-6 and 5-7**. **Table 5-5** presents the results for commercial/industrial worker exposure to surface soil; **Table 5-6** presents the results for hypothetical future residential exposure to surface soil; and **Table 5-7** presents the results for hypothetical future residential exposure to combined surface and subsurface soil. The results of the preliminary risk evaluation are also summarized in **Table 5-8** and discussed by receptor below.

5.6.1 Commercial/Industrial Worker Exposure to Surface Soil

Industrial workers were assumed to contact surface (current) soil. This is a conservative assumption since most of the area is paved and exposure to soil is unlikely to occur while the pavement is intact. The evaluated exposure pathways

included incidental soil ingestion, dermal contact with soil and inhalation of COPCs adhered to dust. The calculated ELCR for industrial work exposure to surface soil (2×10^{-5}) was within USEPA's accepted target risk range, and the calculated HI was 0.2, below the benchmark of 1, as seen in **Table 5-5**. Several metals detected in surface soil (arsenic, cobalt, and manganese) are within the background range. Following USEPA (2002b) guidance, potential risks were recalculated excluding background. The calculated potential risk associated with site-related constituent is 1×10^{-5}, i.e., excluding metals detected within background levels (i.e., arsenic, cobalt and manganese). The calculated HI for only site-related constituents was calculated to be 0.1.

5.6.2 Hypothetical Future Residential Exposure to Surface Soil

Potential risks for the hypothetical future resident were evaluated assuming no change in site conditions, and thus, they would only be exposed to surface soil Exposure pathways included incidental soil ingestion, dermal contact with soil and inhalation of COPCs adhered to dust and as vapors. The calculated ELCR for residential exposure to surface soil was 1×10^{-4} which is within USEPA's accepted target risk range. Several metals detected in soil (arsenic, cobalt, manganese) are within the background range. Following USEPA (2002b) guidance, potential risks were recalculated excluding background. The potential risk associated with site-related COPCs is $9x10^{-5}$, which is within the generally accepted target risk range (**Table 5-6**). The site-related noncancer hazard for all constituents was greater than 1 (HI=4). When potential hazards were recalculated excluding background, the HI was 3. Following USEPA (1989) guidance, the hazard index was reevaluated looking at critical effects or target organs. The site-related organ-specific HIs were less than or equal to 1, as shown in **Table 5-6**.

5.6.3 Hypothetical Future Residential Exposure to Combined Surface and Subsurface Soil

Potential risks for the hypothetical future residents were also evaluated under a redevelopment scenario. During redevelopment, it is likely that subsurface soils would be brought to the surface during soil moving activities, for example if the site were regraded. Thus exposure to both surface and subsurface soil was evaluation. Exposure pathways included incidental soil ingestion, dermal contact with soil and inhalation of COCPs adhered to dust and as vapors. The calculated ELCR for residential exposure to combined surface and subsurface soil was 9×10^{-5} which is within USEPA's accepted target risk range. Several metals detected in soil (arsenic, cobalt, manganese and vanadium) are within the background range. Following USEPA (2002b) guidance, potential risks were recalculated excluding background. The potential risk associated with site-related COPCs is $7x10^{-5}$, which is within the generally accepted target risk range (**Table 5-7**). The site-related noncancer hazard

was greater than 1 (HI=2). Following USEPA (1989) guidance, the hazard index was reevaluated looking at critical effects or target organs. The site-related organ-specific HIs were below 1, as shown in **Table 5-7**.

5.7 Uncertainty

The risk estimate presented here is a conservative estimate of potential risks associated with exposure to constituents detected in soil at AOC A. Uncertainty is inherent in the risk assessment process, and a discussion of these uncertainties is presented in this section. Each of the three basic building blocks for risk assessment (data, exposure scenarios, and toxicity values) contributes uncertainties. Each of the uncertainties is accounted for by using conservative assumptions wherever specific data are unavailable.

This risk assessment is based on the assumption that the available data adequately describe the occurrence of constituents in media at the site. Environmental sampling itself introduces uncertainty. This source of uncertainty can be reduced through a well-designed sampling plan, use of appropriate sampling techniques, and implementation of laboratory data validation and QA/QC. The data utilized in this report meet QA/QC requirements and are appropriate for use in a risk assessment.

The assumption that the concentrations will remain constant throughout the exposure period is a conservative approach, since ongoing natural attenuation and degradation processes likely will reduce the concentrations over time. Using the UCL or the maximum concentration as the EPC is also conservative. It is highly unlikely that receptors would be exposed to those upper bound concentrations over an extended period of time.

Potential exposure scenarios contribute uncertainty to the risk assessment as well. The evaluation of the hypothetical future residential scenarios is a highly conservative assumption as the reasonably anticipated future use is military/industrial.

RSLs were unavailable for two compounds: dimethyl phthalate and di-n-octyl phthalate. RSLs cannot be calculated as no peer-reviewed toxicity values are available in the United States or internationally, (International Toxicity Estimates for Risk Assessments [TERA] database search performed April 15, 2009). USEPA has evaluated the carcinogenicity of dimethyl phthalate and classifies this chemical as D - not classifiable as to human carcinogenicity.

Dimethyl phthalate was detected in 2 of 12 samples at the reporting limit (0.21 mg/kg). Di-n-octylphthalate was detected in 3 of 12 samples at concentrations below the

reporting limit (0.012 to 0.038 mg/kg). The RSLs for other phthalates detected range from 120 mg/kg to 490,000 mg/kg. The limited presence and their presence at levels several orders of magnitude below similar compounds' screening levels indicates that their omission from the SLHHRA is likely not significant. It should also be noted that potential risks and hazards could be not calculated following formal risk assessment practices either due to the lack of available toxicity data.

5.8 Risk Assessment Summary

The AOC A screening level risk assessment evaluated current commercial/industrial worker exposure to surface soil, and future hypothetical residential exposure both to surface soil and to combined surface/subsurface soil.

Under the reasonably anticipated current commercial/industrial worker scenario and the hypothetical future residential land-use scenarios, the estimated potential risks were within the USEPA generally accepted target risk range ($1x10^{-4}$ to $1x10^{-6}$) and the potential hazards were less than or equal to the benchmark hazard index threshold of 1, when segregated by target site/critical effect. Therefore, site-related constituents in soil do not pose an unacceptable risk under either scenario.

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

6. Conclusions and Recommendations

Site investigations were conducted at AOC-A between 2002 and 2008. The results of these investigations indicate that while site-related constituents are present in soil underneath the concrete storm water conveyance, they are limited to surface soil in the immediate vicinity of sample locations ASB3 and ASB5, an area of approximately 100 square ft at the north end of the concrete stormwater conveyance. The compounds that are present above screening levels include iron, Aroclor-1254 and DNTs (2,4-DNT and 2,6-DNT). These compounds are at or marginally above industrial screening levels in a very small area which is currently covered by concrete. DNT and PCB concentrations in shallow soil were greater their SSLs at location ASB3 however because this area is capped with a concrete surface water conveyance, mobilization of these compounds is not a concern. Furthermore these compounds were not detected in the samples collected at greater depths confirming that vertical transport is not occurring. In addition, the levels of metals present in soil are consistent with background levels at Radford Army Ammunition Plant.

There are no current future development plans for RAAP-031 (AOC A); however, the SLHHRA evaluated hypothetical future potential residential land use (i.e., unrestricted land-use scenario) under two scenarios (no change in site conditions and future redevelopment). The results of the SLHHRA indicate that the observed levels of constituents in surface soil and in the combined surface and subsurface soil do not pose an unacceptable risk to hypothetical future residential receptors and that there are presently no constituents present in the soil that would limit current or future activities at the site.

Based on the data presented in this report, clean closure with no action is recommended for RAAP-031 (AOC A). No action is appropriate based on the following major findings:

- Site-related constituents are limited to surface soil in a small area, capped by a concrete storm water conveyance; and

- There are no unacceptable risks at RAAP-031 under the current commercial/industrial or both of the hypothetical future residential use scenarios evaluated.

7. References

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Tables

Table 3-1. Summary of Analytical Data for Detected Organic Compounds in Soil
RAAP-031 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)	Units	ASB1 0 - 1 10/11/03	ASB1 10 - 12 10/11/03	ASB1 26 - 28 10/11/03	ASB2 0 - 1 10/11/03	ASB2 10 - 12 10/11/03	ASB2 21 - 23 10/11/03	ASB3 0 - 1 10/11/03	ASB3 0 - 1 06/30/08	ASB3 6 - 8 10/11/03	ASB3 13 - 14.7 10/11/03	A31-SB003A 0 - 1 12/30/08	A31-SB003A 5 - 6 12/30/08
Volatile Organics															
Acetone	110,000 {sat}	88	mg/kg	0.015 J,B	0.019 J,B	0.029 ,B	0.016 J,B	0.023 J,B [0.024 J,B]	0.023 J,B	0.012 J,B	NA	0.019 J,B	0.018 J,B	NA	NA
Benzene	5.6 {ca*}	0.056	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA
Ethylbenzene	29 {ca}	17.8	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA
Methyl acetate	29,000 {sat}	152	mg/kg	<0.024	<0.026	<0.026 ,J	<0.025	<0.026 [<0.028]	<0.027	<0.025	NA	<0.025	<0.024	NA	NA
Methylene Chloride	54 {ca}	0.026	mg/kg	0.0049 J	0.0059 J	0.0066 J,B	0.0045 J	0.0077 J [0.0070 J]	0.011 J	0.0053 J	NA	0.0066 J	0.0037 J	NA	NA
Toluene	930 {sat}	15.2	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA
Xylenes (total)	300 {sat}	220	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA
Semivolatile Organics															
1,1'-Biphenyl	260 {sat}	460	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	0.85 J	<0.22	<0.22	<1.0	<0.22 [<0.22]	<0.23	*28 J*	*98*	0.023 J	<0.20	<0.42 J	<0.44 J
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	0.082 J	<0.22	<0.22	0.10 J	<0.22 [<0.22]	<0.23	*3.3 E,J*	*4.6 J*	<0.21	<0.20	<0.42	<0.44
2-Methylnaphthalene	440 {sat}	18	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA
Acenaphthene	3,300 {nc}	540	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA
Acenaphthylene	3,300 {nc}	- -	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA
Anthracene	170,000 {max}	9,000	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.15	<0.21	<0.20	NA	NA
Benzo(a)pyrene	0.21 {ca**}	6.2	mg/kg	0.0090 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	0.010 J,J	<0.15	<0.21	<0.20	NA	NA
Benzo(b)fluoranthene	2.1 {ca**}	0.94	mg/kg	0.016 J,J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21 ,J	<0.15	<0.21	<0.20	NA	NA
Benzo(g,h,i)perylene	1,700 {nc}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA
Benzo(k)fluoranthene	21 {ca**}	9.2	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21 ,J	<0.38	<0.21	<0.20	NA	NA
bis(2-Ethylhexyl)phthalate	120 {ca*}	40	mg/kg	1.4	0.022 J	0.017 J	0.11 J	0.022 J [0.016 J]	0.034 J	1.2 E,J	3.4	0.020 J	0.022 J	NA	NA
Butylbenzylphthalate	120,000 {max}	2,800	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	0.0090 J	0.24	<0.38	<0.21	<0.20	NA	NA
Carbazole	86 {ca**}	1.54	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38 J	NA	NA	NA	NA
Chrysene	210 {ca**}	28	mg/kg	0.015 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	0.057 J	<0.21	0.20 J	NA	NA
Dibenzo(a,h)anthracene	0.21 {ca**}	0.3	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.15	NA	NA	NA	NA
Diethylphthalate	490,000 {max}	260	mg/kg	0.014 J	0.0080 J	0.010 J	0.010 J	0.010 J [<0.22]	0.0080 J	0.014 J	0.16 J	0.010 J	0.0080 J	NA	NA
Dimethylphthalate	- -	- -	mg/kg	0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA
Di-n-Butylphthalate	6,200 {nc}	220	mg/kg	5.1	0.093 J	0.13 J	4.3	0.59 [0.64]	0.60	130	*410 J*	0.32	0.32	NA	NA
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	*0.93 J*	<0.22	<0.22	*0.10 J*	<0.22 [<0.22]	<0.23	*31 J*	*100 J*	*0.023 J*	<0.20	<0.42	<0.44
Di-n-Octylphthalate	- -	- -	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	0.038 J	<0.38	<0.21	<0.20	NA	NA
Fluoranthene	2,200 {nc}	4,200	mg/kg	0.030 J	<0.22	<0.22	0.0030 J	<0.22 [<0.22]	<0.23	0.0088 J	<0.38	<0.21	0.20 J	NA	NA
Fluorene	2,200 {nc}	660	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	0.0060 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21 J,J	<0.15	<0.21	<0.20	NA	NA
N-Nitrosodiphenylamine	350 {ca**}	3.4	mg/kg	1.0	<0.22	<0.22	0.12 J	<0.22 [<0.22]	<0.23	*4.7 J*	*22 J*	0.0080 J	<0.20	NA	NA
Pentachlorophenol	9 {ca}	0.14	mg/kg	<0.40	<0.42	<0.43	<0.41	<0.43 [<0.43]	<0.45	<0.41	<1.5	<0.41	<0.39	NA	NA
Phenanthrene	170,000 {max}	- -	mg/kg	0.011 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	0.0038 J	NA	<0.21	0.20 J	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	0.026 J	<0.22	<0.22	0.0030 J	<0.22 [<0.22]	<0.23	0.0067 J	<0.38	<0.21	0.20 J	NA	NA
PAHs															
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	<0.026	<0.027	<0.027	0.0036 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	<0.025	NA	NA
Chrysene	210 {ca**}	28	mg/kg	0.0050 J	<0.027	<0.027	0.0037 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	0.0018 J	NA	NA
Fluoranthene	2,200 {nc}	4,200	mg/kg	0.017 J,J	<0.027	<0.027	0.0077 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	0.0087 J	NA	NA
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	<0.026	<0.027	<0.027	0.0062 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	<0.025	NA	NA
Phenanthrene	170,000 {max}	- -	mg/kg	0.0031 J	<0.027	<0.027	0.0040 J	<0.028 [<0.029]	<0.065	0.0019 J	NA	<0.026 ,L	0.0030 J	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	0.011 J	<0.027	<0.027	0.021 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	0.0099 J	NA	NA
Organochlorine Pesticides															
Dieldrin	0.11 {ca}	0.0018	mg/kg	NA	NA	NA	<0.025	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor-1242	0.74 {ca**}	0.06	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.019	NA	NA	<0.021	<0.022
Aroclor-1254	0.74 {ca*}	0.102	mg/kg	NA	NA	NA	0.0099 J	NA	NA	NA	*2.4 J*	NA	NA	<0.021	<0.022
Explosives															
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5 [<0.5]	0.2 J	*20*	NA	<0.5	<0.5	NA	NA
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	<1	<1	<1	<1	<1 [<1]	<1	<1	NA	<1	<1	NA	NA
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	<1	<1	<1	<1	<1 [<1]	*0.2 J*	*20*	NA	<1	<1	NA	NA

Notes:

(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
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 3-1. Summary of Analytical Data for Detected Organic Compounds in Soil
RAAP-031 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)	Units	ASB4 0 - 1 04/20/06	ASB4 10 - 11 04/20/06	ASB4 20 04/20/06	A31-SB004A 0 - 1 12/30/08	A31-SB004A 5 - 6 12/30/08	ASB5 0 - 1 04/20/06	ASB5 0 - 1 06/30/08	ASB5 7 04/20/06	ASB6 0 - 1 06/30/08	ASB6 5 - 6 06/30/08	ASB7 0 - 1 06/30/08	ASB7 5 - 6 06/30/08
Volatile Organics															
Acetone	110,000 {sat}	88	mg/kg	0.38 J,B [0.38 J,B]	0.39 J,B	0.46 J,B	NA	NA	0.42 J,B	NA	0.37 J,B	NA	NA	NA	NA
Benzene	5.6 {ca*}	0.056	mg/kg	0.013 J [<0.065]	<0.064	<0.075	NA	NA	<0.063	NA	<0.068	NA	NA	NA	NA
Ethylbenzene	29 {ca}	17.8	mg/kg	0.015 J [<0.065]	<0.064	<0.075	NA	NA	<0.063	NA	<0.068	NA	NA	NA	NA
Methyl acetate	29,000 {sat}	152	mg/kg	0.085 J [0.089 J]	0.19 J	0.081 J	NA	NA	0.14 J	NA	0.076 J	NA	NA	NA	NA
Methylene Chloride	54 {ca}	0.026	mg/kg	*0.094 JB [0.097 JB]*	*0.099 JB*	*0.11 JB,B*	NA	NA	*0.094 JB,B*	NA	*0.10 JB,B*	NA	NA	NA	NA
Toluene	930 {sat}	15.2	mg/kg	0.081 [<0.065]	<0.064	<0.075	NA	NA	<0.063	NA	<0.068	NA	NA	NA	NA
Xylenes (total)	300 {sat}	220	mg/kg	0.10 J [<0.19]	<0.19	<0.22	NA	NA	<0.19	NA	<0.21	NA	NA	NA	NA
Semivolatile Organics															
1,1'-Biphenyl	260 {sat}	460	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.0022 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	<0.044 [<0.044]	<0.044	<0.051	<0.41 J	<0.40 J	*11*	*2.8 J [7.3 J]*	<0.047	<0.41	<0.40	0.31 J	<0.50
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	<0.022 [<0.022]	<0.022	<0.025	<0.41	<0.40	0.49	0.17 J [0.43 J]	<0.023	<0.41	<0.40	<0.38	<0.50
2-Methylnaphthalene	440 {sat}	18	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.0049 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50
Acenaphthene	3,300 {nc}	540	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.0066 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50
Acenaphthylene	3,300 {nc}	- -	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.021 J	<0.44 [0.057 J]	<0.023	<0.41	<0.40	<0.38	<0.50
Anthracene	170,000 {max}	9,000	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.021 J	<0.44 [0.064 J]	<0.023	<0.41	<0.40	<0.38	<0.50
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.072	*<0.17 J [0.45 J]*	<0.023	<0.16	<0.16	<0.15	<0.20
Benzo(a)pyrene	0.21 {ca**}	6.2	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.022	<0.17 J [0.38 J]	<0.023	<0.16	<0.16	<0.15	<0.20
Benzo(b)fluoranthene	2.1 {ca**}	0.94	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.12	<0.17 J [0.48 J]	<0.023	<0.16	<0.16	<0.15	<0.20
Benzo(g,h,i)perylene	1,700 {nc}	- -	mg/kg	NA	NA	NA	NA	NA	NA	<0.44 [0.28 J]	NA	<0.41	<0.40	<0.38	<0.50
Benzo(k)fluoranthene	21 {ca**}	9.2	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.036	<0.44 [0.38 J]	<0.023	<0.41	<0.40	<0.38	<0.50
bis(2-Ethylhexyl)phthalate	120 {ca*}	40	mg/kg	0.16 ,J [0.31 ,J]	0.42	0.038 J	NA	NA	5.7	0.90 J [2.5 J]	0.13	<0.41	<0.40	1.0	<0.50
Butylbenzylphthalate	120,000 {max}	2,800	mg/kg	<0.087 [<0.088]	<0.087	<0.10	NA	NA	0.16	<0.44 [<0.45]	<0.093	<0.41	<0.40	<0.38	<0.50
Carbazole	86 {ca**}	1.54	mg/kg	NA	NA	NA	NA	NA	NA	<0.44 J [0.077 J]	NA	<0.41	<0.40 J	<0.38 J	<0.50 J
Chrysene	210 {ca**}	28	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.087	0.042 J [0.66]	<0.023	<0.41	<0.40	0.041 J	<0.50
Dibenzo(a,h)anthracene	0.21 {ca**}	0.3	mg/kg	NA	NA	NA	NA	NA	NA	<0.17 [0.29]	NA	<0.16	<0.16	<0.15	<0.20
Diethylphthalate	490,000 {max}	260	mg/kg	0.026 [0.0068 J]	0.0084 J	0.0077 J	NA	NA	0.024	<0.44 [<0.45]	0.0039 J	<0.41	<0.40	<0.38	<0.50
Dimethylphthalate	- -	- -	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.21	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50
Di-n-Butylphthalate	6,200 {nc}	220	mg/kg	0.15 [0.10]	0.47	0.0098 J	NA	NA	62	15 J [68 J]	0.089	0.060 J	<0.40 J	2.7 J	<0.50 J
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	<0.044 [<0.044]	<0.044	<0.051	<0.41	<0.40	*12*	*3.0 J [7.7 J]*	<0.047	<0.41	<0.40	*0.31 J*	<0.50
Di-n-Octylphthalate	- -	- -	mg/kg	0.014 J [0.012 J]	0.013 J	<0.025	NA	NA	0.055	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50
Fluoranthene	2,200 {nc}	4,200	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.43	<0.44 J [1.3 J]	<0.023	<0.41	<0.40	<0.38	<0.50
Fluorene	2,200 {nc}	660	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.014 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	<0.087 [<0.088]	<0.087	<0.10	NA	NA	<0.086	<0.17 [0.39]	<0.093	<0.16	<0.16	<0.15	<0.20
N-Nitrosodiphenylamine	350 {ca**}	3.4	mg/kg	1.0 ,J [0.34 ,J]	0.15	<0.025	NA	NA	2.9	0.93 [1.4]	0.0052 J	<0.41	<0.40	0.20 J	<0.50
Pentachlorophenol	9 {ca}	0.14	mg/kg	<0.044 [<0.044]	<0.044	<0.051	NA	NA	0.10	<1.7 [<1.8]	<0.047	<1.6	<1.6	<1.5	<2.0
Phenanthrene	170,000 {max}	- -	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.16	NA	<0.023	NA	NA	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	<0.022 [<0.022]	<0.022	<0.025	NA	NA	0.24	<0.44 J [0.81 J]	<0.023	<0.41	<0.40	<0.38	<0.50
PAHs															
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	210 {ca**}	28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,200 {nc}	4,200	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	170,000 {max}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides															
Dieldrin	0.11 {ca}	0.0018	mg/kg	*0.014 J,J [0.0032 J,J]*	*0.0046 J,J*	<0.03	NA	NA	<0.51	NA	<0.027	NA	NA	NA	NA
PCBs															
Aroclor-1242	0.74 {ca**}	0.06	mg/kg	NA	NA	NA	<0.020	<0.020	NA	<0.022 [<0.022]	NA	<0.020	<0.020	<0.019	<0.025
Aroclor-1254	0.74 {ca*}	0.102	mg/kg	0.00014 [0.030 J]	0.041 J	<0.049	<0.020	<0.020	*2.4*	*1.2 J [0.34 J]*	*0.16*	<0.020	<0.020	0.096 J	<0.025
Explosives															
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	<0.5 [<0.5]	<0.5	<0.5	NA	NA	1.3	NA	<0.5	NA	NA	NA	NA
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	<1 [<1]	<1	<1	NA	NA	0.25 J,J	NA	<1	NA	NA	NA	NA
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	<1 [<1]	<1	<1	NA	NA	*1.55 J*	NA	<1	NA	NA	NA	NA

Notes:

(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
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 3-1. Summary of Analytical Data for Detected Organic Compounds in Soil
RAAP-031 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)	Units	ASB8 0 - 1 06/30/08	ASB8 5 - 6 06/30/08	ASB9 0 - 1 06/30/08	ASB9 5 - 6 06/30/08	ASB10 0 - 1 06/30/08	ASB10 5 - 6 06/30/08	A31-SB011 0 - 1 12/30/08	A31-SB012 1 - 2 12/30/08	A31-SB012 5 - 6 12/30/08	A31-SB013 0 - 1 12/30/08	A31-SB013 5 - 6 12/30/08	A31-SB014 0 - 1 12/30/08	A31-SB014 5 - 6 12/30/08
Volatile Organics																
Acetone	110,000 {sat}	88	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.6 {ca*}	0.056	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	29 {ca}	17.8	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	29,000 {sat}	152	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	54 {ca}	0.026	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	930 {sat}	15.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	300 {sat}	220	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organics																
1,1'-Biphenyl	260 {sat}	460	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	<0.42 J	<0.45 J	<0.41 J [<0.42]	<0.42 J	0.50 J	<0.42 J
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	<0.42	<0.45	<0.41 [<0.42]	<0.42	<0.42	<0.42
2-Methylnaphthalene	440 {sat}	18	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,300 {nc}	540	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	3,300 {nc}	- -	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Anthracene	170,000 {max}	9,000	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.21 {ca**}	6.2	mg/kg	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1 {ca**}	0.94	mg/kg	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1,700 {nc}	- -	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	21 {ca**}	9.2	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	120 {ca*}	40	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	120,000 {max}	2,800	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Carbazole	86 {ca**}	1.54	mg/kg	<0.45 J	<0.49 J	<0.45 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA	NA	NA	NA	NA
Chrysene	210 {ca**}	28	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.21 {ca**}	0.3	mg/kg	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	490,000 {max}	260	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Dimethylphthalate	- -	- -	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Di-n-Butylphthalate	6,200 {nc}	220	mg/kg	<0.45 J	<0.49 J	0.12 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	<0.42	<0.45	<0.41 [<0.42]	<0.42	*0.50 J*	<0.42
Di-n-Octylphthalate	- -	- -	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,200 {nc}	4,200	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,200 {nc}	660	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	350 {ca**}	3.4	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	9 {ca}	0.14	mg/kg	<1.8	<1.9	<1.8	<1.7	<1.7	<1.8	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	170,000 {max}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA	NA	NA	NA	NA
PAHs																
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	210 {ca**}	28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,200 {nc}	4,200	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	170,000 {max}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides																
Dieldrin	0.11 {ca}	0.0018	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs																
Aroclor-1242	0.74 {ca**}	0.06	mg/kg	<0.023	<0.024	<0.022	<0.022	0.015 J	<0.022	<0.020	<0.021	<0.022	<0.020 [<0.021]	<0.021	<0.021	<0.021
Aroclor-1254	0.74 {ca*}	0.102	mg/kg	<0.023	<0.024	*0.20 J*	<0.022	0.011 J	0.016 J	<0.020	<0.021	<0.022	<0.020 [<0.021]	<0.021	<0.021	<0.021
Explosives																
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	NA	NA	NA	NA	NA	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.
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 3-1. Summary of Analytical Data for Detected Organic Compounds in Soil
RAAP-031 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)	Units	A31-SB015 2 - 3 12/30/08	A31-SB015 5 - 6 12/30/08	A31-SB016 0 - 1 12/30/08	A31-SB016 5 - 6 12/30/08	A31-SB017 0 - 1 12/30/08	A31-SB017 5 - 6 12/30/08	A31-SB018 0 - 1 12/30/08	A31-SB018 5 - 6 12/30/08	A31-SB019 0 - 1 12/30/08	A31-SB019 5 - 6 12/30/08
Volatile Organics													
Acetone	110,000 {sat}	88	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.6 {ca*}	0.056	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	29 {ca}	17.8	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	29,000 {sat}	152	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	54 {ca}	0.026	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	930 {sat}	15.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	300 {sat}	220	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organics													
1,1'-Biphenyl	260 {sat}	460	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	<0.42 J	<0.41 J	<0.42 J	<0.42 J	<0.42 J	<0.41 J	<0.46 J	<0.42 J	<0.42 J	<0.42 J
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	<0.42	<0.41	<0.42	<0.42	<0.42 J	<0.41	<0.46 J	<0.42 J	<0.42 J	<0.42
2-Methylnaphthalene	440 {sat}	18	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,300 {nc}	540	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	3,300 {nc}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	170,000 {max}	9,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.21 {ca**}	6.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.1 {ca**}	0.94	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1,700 {nc}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	21 {ca**}	9.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	120 {ca*}	40	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	120,000 {max}	2,800	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	86 {ca**}	1.54	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	210 {ca**}	28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.21 {ca**}	0.3	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	490,000 {max}	260	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethylphthalate	- -	- -	mg/kg	NA	NA	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	NA	NA
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	<0.42	<0.41	<0.42	<0.42	<0.42	<0.41	<0.46	<0.42	<0.42	<0.42
Di-n-Octylphthalate	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,200 {nc}	4,200	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,200 {nc}	660	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	350 {ca**}	3.4	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	9 {ca}	0.14	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	170,000 {max}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAHs													
Benzo(a)anthracene	2.1 {ca**}	0.28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	210 {ca**}	28	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,200 {nc}	4,200	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.1 {ca**}	3.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	170,000 {max}	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700 {nc}	3,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides													
Dieldrin	0.11 {ca}	0.0018	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor-1242	0.74 {ca**}	0.06	mg/kg	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Aroclor-1254	0.74 {ca*}	0.102	mg/kg	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Explosives													
2,4-Dinitrotoluene	120 {nc}	1.36	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	62 {nc}	0.68	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	2.5 {ca}	0.0019	mg/kg	NA	NA	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.
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 3-2. Summary of Analytical Data for Detected Inorganic Compounds in Soil
RAAP-031 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	ASB1 0 - 1 10/11/03	ASB1 10 - 12 10/11/03	ASB1 26 - 28 10/11/03	ASB2 0 - 1 10/11/03	ASB2 10 - 12 10/11/03	ASB2 21 - 23 10/11/03	ASB3 0 - 1 10/11/03	ASB3 0 - 1 06/30/08	ASB3 6 - 8 10/11/03	ASB3 13 - 14.7 10/11/03	A31-SB003A 0 - 1 12/30/08	A31-SB003A 5 - 6 12/30/08	ASB4 0 - 1 04/20/06	ASB4 10 - 11 04/20/06	ASB4 20 04/20/06
Inorganics																			
Aluminum	990,000 {max}	- -	40,041	mg/kg	32,000	30,800	36,300	28,500	32,300 [34,800]	35,000	32,100	26,100	28,300	24,500	NA	NA	33,000 ,J [28,000 ,J]	26,000 ,J	27,000 ,J
Antimony	41 {nc}	- -	- -	mg/kg	0.0860 J	<0.500	0.180 J	0.0710 J	<0.500 [0.0680 J]	<0.500	<0.500	<3.40	<0.500	<0.500	NA	NA	0.100 J,J [0.240 J,J]	<0.500 ,J	0.140 J,J
Arsenic	1.6 {ca}	- -	15.8 {C}	mg/kg	3.00	1.80	8.10	2.90	3.40 [4.70]	4.50	1.90	4.90	1.60	2.20	NA	NA	2.00 ,J [1.70 ,J]	1.60 ,J	4.20 ,J
Barium	190,000 {max}	- -	209 {N}	mg/kg	86.0	99.0	115	61.0	77.0 [98.0]	88.0	114	203	63.0	50.0	NA	NA	67.0 ,J [57.0 ,J]	50.0 ,J	86.0 ,J
Beryllium	200 {nc}	- -	1.02 {N}	mg/kg	0.530 J	0.900 J	**1.80**	0.550 J	**1.30 [0.860 J]**	0.590 J	0.620 J	0.900 J	0.570 J	0.640 J	NA	NA	0.550 J,J [0.640 J,J]	0.590 J,J	**1.10 ,J**
Cadmium	81 {nc}	- -	0.69 {N}	mg/kg	**0.940 J**	<1.00	0.460 J	0.260 J	0.360 J [<1.00]	<1.00	<1.00	0.470 J	**0.750 J**	<1.00	NA	NA	0.0760 J,J [0.170 J,J]	0.0360 J,J	0.150 J,J
Calcium	- -	- -	- -	mg/kg	2,570	408	126 J	6,100	867 [380]	310	3,910	15,900	644	293	NA	NA	2,200 ,J [2,100 ,J]	710 ,J	320 ,J
Chromium	1,460 {ca**}	- -	65.3 {N}	mg/kg	38.0 ,J	31.0 ,J	40.0 ,J	36.0 ,J	39.0 ,J [41.0 ,J]	52.0 ,J	33.0 ,J	44.7	30.0 ,J	41.0 ,J	NA	NA	29.0 ,J [43.0 ,J]	28.0 ,J	21.0 ,J
Cobalt	30 {nc}	- -	72.3	mg/kg	8.80 ,J	24.0 ,J	15.0 ,J	9.30 ,J	14.0 ,J [22.0 ,J]	20.0 ,J	24.0 ,J	9.90	12.0 ,J	11.0 ,J	NA	NA	6.20 ,J [6.20 ,J]	6.30 ,J	33.0 ,J
Copper	4,100 {nc}	- -	53.5 {N}	mg/kg	**155**	20.0	43.0	**57.0**	19.0 [23.0]	22.0	36.0	**245**	17.0	14.0	NA	NA	**460 ,J [560 ,J]**	15.0 ,J	30.0 ,J
Cyanide	2,000 {nc}	- -	- -	mg/kg	0.0600 J	<0.500	0.470 J	0.230 J	0.180 J [0.140 J]	<0.500	0.150 J	NA	<0.500	<0.500	NA	NA	<0.260 [<0.260]	<0.260	0.720
Iron	720,000 {max}	- -	50,962 {N}	mg/kg	41,600	37,500	42,200	38,100	40,300 [38,000]	40,200	38,300	49,500	36,500	33,600	NA	NA	**40,000 ,J [66,000 ,J]**	33,000 ,J	**55,000 ,J**
Lead	750 { }	- -	26.8	mg/kg	**76.0**	26.0	19.0	25.0	8.80 ,J [13.0 ,J]	12.0	**34.0**	**170**	11.0	12.0	NA	NA	**30.0 ,J [34.0 ,J]**	13.0 ,J	25.0 ,J
Magnesium	- -	- -	- -	mg/kg	2,450	2,050	5,870	3,180	5,220 J [2,800 J]	2,120	2,090	7,190	1,980	1,160	NA	NA	2,600 ,J [2,400 ,J]	1,300 ,J	3,900 ,J
Manganese	2,300 {nc}	- -	2,543 {N}	mg/kg	315	1,750	1,170	426	648 [859]	704	2,400	397	483	330	NA	NA	290 ,J [350 ,J]	260 ,J	1,700 ,J
Mercury	3.1 {sat}	2	0.13	mg/kg	0.0670 J	0.0190 J	0.0750 J	0.0450 J	0.0140 J [0.0220 J	0.0200 J	0.0520 J	0.0970	0.0300 J	0.0250 J	NA	NA	0.0410 J,J [0.0350 J,J	0.0330 J,J	0.0250 J,J
Nickel	2,000 {nc}	- -	62.8 {N}	mg/kg	13.0	16.0	28.0	13.0	36.0 ,J [21.0 J]	20.0	12.0	20.1	13.0	14.0	NA	NA	16.0 ,J [13.0 ,J]	12.0 ,J	32.0 ,J
Potassium	- -	- -	- -	mg/kg	1,540	1,840	3,780	1,220	2,750 J [1,560 J]	1,260	1,410	1,540	1,670	1,010	NA	NA	1,600 ,J [1,500 ,J]	1,200 ,J	2,600 ,J
Selenium	510 {nc}	- -	- -	mg/kg	0.560 J	0.520 J	0.990 J	0.470 J	0.600 J [0.500 J]	0.450 J	0.300 J	<1.80	0.400 J	0.400 J	NA	NA	<1.00 ,J [0.0700 J,J]	0.0700 J,J	0.100 J,J
Silver	510 {nc}	- -	- -	mg/kg	0.0700 J	0.0610 J	0.110 J	0.0720 J	0.0930 J [0.0940 J	0.0750 J	0.0540 J	<2.30	0.0480 J	0.0740 J	NA	NA	0.100 J,J [0.0650 J,J]	0.0450 J,J	0.190 J,J
Sodium	- -	- -	- -	mg/kg	95.0 J	122	54.0 J	77.0 J	77.0 J [50.0 J]	50.0 J	207	<1,150	237	131	NA	NA	120 ,J [49.0 J,J]	330 ,J	<100 ,J
Thallium	6.6 {nc}	- -	2.11 {N}	mg/kg	0.240 J,B	0.430 J	0.450 J	0.230 J,B	.230 J,B [0.220 J,B	0.210 J,B	0.480 J	<2.30	0.200 J,B	0.150 J,B	NA	NA	0.320 J,J [0.240 J,J]	0.190 J,J	0.370 J,J
Vanadium	520 {nc}	- -	108 {N}	mg/kg	68.0 ,L	66.0 ,L	56.0 ,L	63.0 ,L	55.0 L [49.0 L]	54.0 ,L	68.0 ,L	66.5	66.0 ,L	42.0 ,L	NA	NA	91.0 ,J [75.0 ,J]	71.0 ,J	77.0 ,J
Zinc	310,000 {max}	- -	202 {N}	mg/kg	78.0	56.0	109	58.0	45.0 [37.0]	40.0	56.0	**313**	46.0	44.0	NA	NA	76.0 ,J [140 ,J]	47.0 ,J	37.0 ,J

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 3-2. Summary of Analytical Data for Detected Inorganic Compounds in Soil
RAAP-031 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	A31-SB004A 0 - 1 12/30/08	A31-SB004A 5 - 6 12/30/08	ASB5 0 - 1 04/20/06	ASB5 0 - 1 06/30/08	ASB5 7 04/20/06	ASB6 0 - 1 06/30/08	ASB6 5 - 6 06/30/08	ASB7 0 - 1 06/30/08	ASB7 5 - 6 06/30/08	ASB8 0 - 1 06/30/08	ASB8 5 - 6 06/30/08	ASB9 0 - 1 06/30/08	ASB9 5 - 6 06/30/08	ASB10 0 - 1 06/30/08	ASB10 5 - 6 06/30/08	A31-SB011 0 - 1 12/30/08
Inorganics																				
Aluminum	990,000 {max}	- -	40,041	mg/kg	NA	NA	21,000 ,J	32,300 [35,400]	36,000 ,J	37,000	31,900	28,600	34,700	38,100	35,600	37,100	34,800	38,800	**42,300**	NA
Antimony	41 {nc}	- -	- -	mg/kg	NA	NA	0.630 ,J	<3.60 [<3.80]	<0.500 ,J	<3.60	<3.40	<3.30	<4.10	<4.00	<4.40	<4.00	<3.70	<3.90	<3.80	NA
Arsenic	1.6 {ca}	- -	15.8 {C}	mg/kg	NA	NA	**20.0 ,J**	10.4 [11.0]	1.80 ,J	3.60	2.30	4.60	3.60	4.20	3.30	6.40	2.80	6.30	3.60	NA
Barium	190,000 {max}	- -	209 {N}	mg/kg	NA	NA	150 ,J	114 [90.9]	94.0 ,J	54.1	49.8	55.7	85.3	42.8	78.1	74.4	76.9	55.5	74.2	NA
Beryllium	200 {nc}	- -	1.02 {N}	mg/kg	NA	NA	0.590 J,J	0.790 J [0.800 J]	0.840 J,J	0.760 J	0.680 J	0.530 J	0.850 J	0.780 J	0.880 J	0.790 J	0.900 J	0.710 J	0.940 J	NA
Cadmium	81 {nc}	- -	0.69 {N}	mg/kg	NA	NA	**1.30 ,J**	**0.850 J [0.520 J]**	0.0720 J,J	<1.20	<1.10	0.230 J	<1.40	<1.30	<1.50	<1.30	<1.20	<1.30	<1.30	NA
Calcium	- -	- -	- -	mg/kg	NA	NA	18,000 ,J	6,700 [9,020]	220 J,J	1,120 J	<1,130	722 J	<1,370	1,620	420 J	1,890	<1,250	1,480	<1,250	NA
Chromium	1,460 {ca**}	- -	65.3 {N}	mg/kg	NA	NA	**100 ,J**	46.4 [59.7]	30.0 ,J	30.7	24.2	39.0	43.8	27.6	24.1	39.2	23.0	47.3	41.3	NA
Cobalt	30 {nc}	- -	72.3	mg/kg	NA	NA	6.90 ,J	7.60 [6.30]	22.0 ,J	5.30	3.90	4.00	21.0	3.80 J	7.40	5.40	32.7	3.60 J	6.40	NA
Copper	4,100 {nc}	- -	53.5 {N}	mg/kg	NA	NA	**150 ,J**	**113 [68.1]**	21.0 ,J	21.1	14.6	30.9	17.7	20.2	20.0	**90.5**	19.2	18.7	20.1	NA
Cyanide	2,000 {nc}	- -	- -	mg/kg	NA	NA	0.210 j	NA	0.600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	720,000 {max}	- -	50,962 {N}	mg/kg	NA	NA	33,000 ,J	44,400 [45,300]	47,000 ,J	46,900	33,400	38,500	44,300	47,700	44,300	48,000	46,100	**56,400**	50,100	NA
Lead	750 { }	- -	26.8	mg/kg	NA	NA	**330 ,J**	**78.4 [95.7]**	24.0 ,J	18.0	10.9	22.9	16.0	16.3	10.7	**29.0**	20.6	18.5	20.0	NA
Magnesium	- -	- -	- -	mg/kg	NA	NA	10,000 ,J	4,480 [5,030]	2,700 ,J	1,560	1,210	1,050 J	1,230 J	1,700	2,350	1,710	2,170	1,540	1,540	NA
Manganese	2,300 {nc}	- -	2,543 {N}	mg/kg	NA	NA	310 ,J	329 [244]	950 ,J	226	135	168	772	152	232	272	836	117	364	NA
Mercury	3.1 {sat}	2	0.13	mg/kg	NA	NA	**0.140 ,J**	0.0880 [0.0810]	0.0620 J,J	0.0670	0.0290 J	0.0720	0.0860	0.0560	0.0280 J	0.0930	0.0700	**0.180**	0.0290 J	NA
Nickel	2,000 {nc}	- -	62.8 {N}	mg/kg	NA	NA	13.0 ,J	18.4 [13.3]	19.0 ,J	12.4	11.2	8.50	12.9	12.6	15.2	12.7	14.2	10.6	14.7	NA
Potassium	- -	- -	- -	mg/kg	NA	NA	1,100 ,J	1,510 [1,520]	2,600 ,J	1,250	1,350	922 J	1,520	1,450	2,390	1,540	2,370	967 J	1,890	NA
Selenium	510 {nc}	- -	- -	mg/kg	NA	NA	0.320 J,J	<1.90 [<2.00 J]	0.160 J,J	<1.90	<1.80	<1.80	<2.20	<2.10 J	<2.40	<2.10	<2.00	<2.10	<2.00	NA
Silver	510 {nc}	- -	- -	mg/kg	NA	NA	0.180 J,J	<2.40 [<2.50]	0.0640 J,J	<2.40	<2.30	<2.20	<2.70	<2.70	<2.90	<2.70	<2.50	<2.60	<2.50	NA
Sodium	- -	- -	- -	mg/kg	NA	NA	41.0 J,J	<1,210 [<1,270]	<100 ,J	<1,190	<1,130	<1,120	<1,370	<1,340	<1,470	546 J	<1,250	<1,290	<1,250	NA
Thallium	6.6 {nc}	- -	2.11 {N}	mg/kg	NA	NA	0.210 J,J	<2.40 [<2.50]	0.390 J,J	<2.40	<2.30	<2.20	<2.70	<2.70	<2.90	<2.70	<2.50	<2.60	<2.50	NA
Vanadium	520 {nc}	- -	108 {N}	mg/kg	NA	NA	56.0 ,J	77.6 [83.5]	96.0 ,J	88.3	64.0	74.3	84.2	86.1	85.8	86.5	85.8	98.2	91.6	NA
Zinc	310,000 {max}	- -	202 {N}	mg/kg	NA	NA	**1,400 ,J**	**540 [375]**	69.0 ,J	43.6	35.8	48.9	53.9	43.8	53.4	123	51.7	52.7	58.4	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.
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 3-2. Summary of Analytical Data for Detected Inorganic Compounds in Soil
RAAP-031 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	A31-SB012 1 - 2 12/30/08	A31-SB012 5 - 6 12/30/08	A31-SB013 0 - 1 12/30/08	A31-SB013 5 - 6 12/30/08	A31-SB014 0 - 1 12/30/08	A31-SB014 5 - 6 12/30/08	A31-SB015 2 - 3 12/30/08	A31-SB015 5 - 6 12/30/08	A31-SB016 0 - 1 12/30/08	A31-SB016 5 - 6 12/30/08	A31-SB017 0 - 1 12/30/08	A31-SB017 5 - 6 12/30/08	A31-SB018 0 - 1 12/30/08	A31-SB018 5 - 6 12/30/08	A31-SB019 0 - 1 12/30/08	A31-SB019 5 - 6 12/30/08
Inorganics																				
Aluminum	990,000 {max}	- -	40,041	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	41 {nc}	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	NA	NA	NA
Barium	190,000 {max}	- -	209 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	200 {nc}	- -	1.02 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	81 {nc}	- -	0.69 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	30 {nc}	- -	72.3	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	2,000 {nc}	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	NA	NA	NA
Lead	750 { }	- -	26.8	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	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	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	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	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	510 {nc}	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	510 {nc}	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	6.6 {nc}	- -	2.11 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	520 {nc}	- -	108 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	310,000 {max}	- -	202 {N}	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	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.
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 5-1. Data Summary for Surface Soil (0-1 foot), AOC A - Area 31, Radford, VA

Constituent [a]	Frequency Detects / Total	Percent Detects	[b]	Range of Detects Minimum – Maximum (mg/kg)	Maximum Location	Exposure Point Concentration [c] (mg/kg)
Explosives						
2,4-Dinitrotoluene	7 / 20	35 %	med	0.31 - 98	ASB003	16.57
2,6-Dinitrotoluene	6 / 20	30 %	med	0.082 - 4.6	ASB003	1.011
Dinitrotoluene mixture	8 / 20	40 %	med	0.31 - 102.6	ASB003	17.43
Polychlorinated Biphenyls						
Aroclor 1242	1 / 19	5 %	lo	0.015 - 0.015	ASB010	0.015 m
Aroclor 1254	8 / 19	42 %	med	0.0099 - 2.4	ASB5	0.661
Organochlorine Pesticides						
Dieldrin	1 / 3	33 %	med	0.014 - 0.014	ASB4	0.014 m
Volatile Organic Compounds						
Acetone	5 / 5	100 %	hi	0.012 - 0.42	ASB5	0.42 m
Benzene	1 / 5	20 %	med	0.013 - 0.013	ASB4	0.013 m
Ethylbenzene	1 / 5	20 %	med	0.015 - 0.015	ASB4	0.015 m
Methyl acetate	2 / 5	40 %	med	0.089 - 0.14	ASB5	0.14 m
Methylene Chloride	5 / 5	100 %	hi	0.0045 - 0.097	ASB4	0.097 m
Toluene	1 / 5	20 %	med	0.081 - 0.081	ASB4	0.081 m
Xylenes (total)	1 / 5	20 %	med	0.1 - 0.1	ASB4	0.1 m
Semivolatile Organic Compounds						
1,1'-Biphenyl	1 / 12	8 %	lo	0.0022 - 0.0022	ASB5	0.0022 m
2-Methylnaphthalene	1 / 12	8 %	lo	0.0049 - 0.0049	ASB5	0.0049 m
Acenaphthene	1 / 12	8 %	lo	0.0066 - 0.0066	ASB5	0.0066 m
Acenaphthylene	2 / 12	17 %	med	0.021 - 0.057	ASB005	0.057 m
Anthracene	2 / 12	17 %	med	0.021 - 0.064	ASB005	0.064 m
Benzo(a)anthracene	3 / 12	25 %	med	0.0036 - 1.072	ASB5	1.072 m
Benzo(a)pyrene	4 / 12	33 %	med	0.009 - 0.38	ASB005	0.38 m
Benzo(b)fluoranthene	3 / 12	25 %	med	0.016 - 0.48	ASB005	0.48 m
Benzo(g,h,i)perylene	1 / 12	8 %	lo	0.28 - 0.28	ASB005	0.28 m
Benzo(k)fluoranthene	2 / 12	17 %	med	0.036 - 0.38	ASB005	0.38 m
bis(2-Ethylhexyl)phthalate	8 / 12	67 %	hi	0.11 - 5.7	ASB5	2.285
Butylbenzylphthalate	2 / 12	17 %	med	0.16 - 0.24	ASB3	0.24 m
Carbazole	1 / 7	14 %	lo	0.077 - 0.077	ASB005	0.077 m
Chrysene	6 / 12	50 %	hi	0.0037 - 0.66	ASB005	0.183
Dibenzo(a,h)anthracene	1 / 12	8 %	lo	0.29 - 0.29	ASB005	0.29 m
Diethylphthalate	6 / 12	50 %	hi	0.01 - 0.16	ASB003	0.0842
Dimethylphthalate	2 / 12	17 %	med	0.21 - 0.21	ASB1,ASB5	0.21 m
Di-n-Butylphthalate	10 / 12	83 %	hi	0.06 - 410	ASB003	207.5
Di-n-Octylphthalate	3 / 12	25 %	med	0.014 - 0.055	ASB5	0.055 m
Fluoranthene	5 / 12	42 %	med	0.0077 - 1.3	ASB005	0.378
Fluorene	1 / 12	8 %	lo	0.014 - 0.014	ASB5	0.014 m
Indeno(1,2,3-cd)pyrene	3 / 12	25 %	med	0.006 - 0.39	ASB005	0.39 m
N-Nitrosodiphenylamine	8 / 12	67 %	hi	0.12 - 22	ASB003	6.199
Pentachlorophenol	1 / 12	8 %	lo	0.1 - 0.1	ASB5	0.1 m
Phenanthrene	4 / 5	80 %	hi	0.0038 - 0.16	ASB5	0.16 m
Pyrene	5 / 12	42 %	med	0.0067 - 0.81	ASB005	0.265

Footnotes are on last page.

Table 5-1. Data Summary for Surface Soil (0-1 foot), AOC A - Area 31, Radford, VA

Constituent [a]	Frequency Detects / Total	Percent Detects	[b]	Range of Detects Minimum – Maximum (mg/kg)	Maximum Location	Exposure Point Concentration [c] (mg/kg)
Inorganics						
Aluminum	12 / 12	100 %	hi	21,000 - 38,800	ASB010	35,128
Antimony	4 / 12	33 %	med	0.071 - 0.63	ASB5	0.63 m
Arsenic	12 / 12	100 %	hi	1.9 - 20	ASB5	8.824
Barium	12 / 12	100 %	hi	42.8 - 203	ASB003	117.5
Beryllium	12 / 12	100 %	hi	0.53 - 0.9	ASB003	0.747
Cadmium	7 / 12	58 %	hi	0.17 - 1.3	ASB5	0.809
Calcium	12 / 12	100 %	hi	722 - 18,000	ASB5	9,675
Chromium	12 / 12	100 %	hi	27.6 - 100	ASB5	54.79
Cobalt	12 / 12	100 %	hi	3.6 - 24	ASB3	10.83
Copper	12 / 12	100 %	hi	18.7 - 560	ASB4	231.1
Cyanide	4 / 5	80 %	hi	0.06 - 0.23	ASB2	0.23 m
Iron	12 / 12	100 %	hi	33,000 - 66,000	ASB4	50,449
Lead	12 / 12	100 %	hi	16.3 - 330	ASB5	160.2
Magnesium	12 / 12	100 %	hi	1,050 - 10,000	ASB5	4,987
Manganese	12 / 12	100 %	hi	117 - 2,400	ASB3	1,235
Mercury	12 / 12	100 %	hi	0.041 - 0.18	ASB010	0.104
Nickel	12 / 12	100 %	hi	8.5 - 20.1	ASB003	15.19
Potassium	12 / 12	100 %	hi	922 - 1,600	ASB4	1,462
Selenium	5 / 11	45 %	med	0.07 - 0.56	ASB1	0.496
Silver	5 / 12	42 %	med	0.054 - 0.18	ASB5	0.136
Sodium	6 / 12	50 %	hi	41 - 546	ASB009	318.3
Thallium	5 / 12	42 %	med	0.21 - 0.48	ASB3	0.385
Vanadium	12 / 12	100 %	hi	56 - 98.2	ASB010	84.27
Zinc	12 / 12	100 %	hi	43.6 - 1,400	ASB5	1,373

[a] Detected constituents only are summarized here.

Data from two methods and data from duplicate samples were combined so that the higher detect and the lowest detection limit were used in the risk assessment dataset.

[b] The percent non-detects in each data set is indicated as low "*lo*" (15 percent or less), medium "*med*" (between 15 and 50 percent), or high "*hi*" (50 percent or more).

[c] The exposure point concentration (EPC) was set equal to the lower of the upper confidence limit on the mean (UCL) calculated by ProUCL 4.0 (USEPA, 2007) and the maximum concentration. Where a UCL was not calculable, the maximum concentration was used as the EPC.

m maximum used as the exposure point concentration.

mg/kg Milligrams per kilogram.

Table 5-2. Data Summary for Surface and Subsurface Soil (0-15 foot), AOC A - Area 31, Radford, VA

Constituent [a]	Frequency Detects / Total	Percent Detects	[b]	Range of Detects Minimum – Maximum (mg/kg)	Maximum Location	Exposure Point Concentration [c] (mg/kg)
Explosives						
2,4-Dinitrotoluene	8 / 43	19 %	med	0.023 - 98	ASB003	7.631
2,6-Dinitrotoluene	6 / 43	14 %	lo	0.082 - 4.6	ASB003	0.517
Dinitrotoluene mixture	9 / 43	21 %	med	0.023 - 102.6	ASB003	8.048
Polychlorinated Biphenyls						
Aroclor 1242	1 / 38	3 %	lo	0.015 - 0.015	ASB010	0.015 m
Aroclor 1254	11 / 38	29 %	med	0.0099 - 2.4	ASB5	0.341
Organochlorine Pesticides						
Dieldrin	2 / 5	40 %	med	0.0046 - 0.014	ASB4	0.014 m
Volatile Organic Compounds						
Acetone	11 / 11	100 %	hi	0.012 - 0.42	ASB5	0.42 m
Benzene	1 / 11	9 %	lo	0.013 - 0.013	ASB4	0.013 m
Ethylbenzene	1 / 11	9 %	lo	0.015 - 0.015	ASB4	0.015 m
Methyl acetate	4 / 11	36 %	med	0.076 - 0.19	ASB4	0.19 m
Methylene Chloride	11 / 11	100 %	hi	0.0037 - 0.1	ASB5	0.1 m
Toluene	1 / 11	9 %	lo	0.081 - 0.081	ASB4	0.081 m
Xylenes (total)	1 / 11	9 %	lo	0.1 - 0.1	ASB4	0.1 m
Semivolatile Organic Compounds						
1,1'-Biphenyl	1 / 23	4 %	lo	0.0022 - 0.0022	ASB5	0.0022 m
2-Methylnaphthalene	1 / 23	4 %	lo	0.0049 - 0.0049	ASB5	0.0049 m
Acenaphthene	1 / 23	4 %	lo	0.0066 - 0.0066	ASB5	0.0066 m
Acenaphthylene	2 / 23	9 %	lo	0.021 - 0.057	ASB005	0.057 m
Anthracene	2 / 23	9 %	lo	0.021 - 0.064	ASB005	0.064 m
Benzo(a)anthracene	3 / 23	13 %	lo	0.0036 - 1.072	ASB5	1.072 m
Benzo(a)pyrene	4 / 23	17 %	med	0.009 - 0.38	ASB005	0.38 m
Benzo(b)fluoranthene	3 / 23	13 %	lo	0.016 - 0.48	ASB005	0.48 m
Benzo(g,h,i)perylene	1 / 23	4 %	lo	0.28 - 0.28	ASB005	0.28 m
Benzo(k)fluoranthene	2 / 23	9 %	lo	0.036 - 0.38	ASB005	0.38 m
bis(2-Ethylhexyl)phthalate	14 / 23	61 %	hi	0.016 - 5.7	ASB5	1.287
Butylbenzylphthalate	2 / 23	9 %	lo	0.16 - 0.24	ASB3	0.24 m
Carbazole	1 / 12	8 %	lo	0.077 - 0.077	ASB005	0.077 m
Chrysene	7 / 23	30 %	med	0.0037 - 0.66	ASB005	0.116
Dibenzo(a,h)anthracene	1 / 23	4 %	lo	0.29 - 0.29	ASB005	0.29 m
Diethylphthalate	12 / 23	52 %	hi	0.0039 - 0.16	ASB003	0.0461
Dimethylphthalate	2 / 23	9 %	lo	0.21 - 0.21	ASB1,ASB5	0.21 m
Di-n-Butylphthalate	16 / 23	70 %	hi	0.06 - 410	ASB003	215.7
Di-n-Octylphthalate	4 / 23	17 %	med	0.013 - 0.055	ASB5	0.055 m
Fluoranthene	6 / 23	26 %	med	0.0077 - 1.3	ASB005	0.222
Fluorene	1 / 23	4 %	lo	0.014 - 0.014	ASB5	0.014 m
Indeno(1,2,3-cd)pyrene	3 / 23	13 %	lo	0.006 - 0.39	ASB005	0.39 m
N-Nitrosodiphenylamine	11 / 23	48 %	med	0.0052 - 22	ASB003	3.195
Pentachlorophenol	1 / 23	4 %	lo	0.1 - 0.1	ASB5	0.1 m
Phenanthrene	5 / 11	45 %	med	0.0038 - 0.2	ASB3	0.0792
Pyrene	6 / 23	26 %	med	0.0067 - 0.81	ASB005	0.16

Footnotes are on last page.

Table 5-2. Data Summary for Surface and Subsurface Soil (0-15 foot), AOC A - Area 31, Radford, VA

Constituent [a]	Frequency Detects / Total	Percent Detects	[b]	Range of Detects Minimum – Maximum (mg/kg)	Maximum Location	Exposure Point Concentration [c] (mg/kg)
Inorganics						
Aluminum	23 / 23	100 %	hi	21,000 - 42,300	ASB010	34,344
Antimony	5 / 23	22 %	med	0.068 - 0.63	ASB5	0.269
Arsenic	23 / 23	100 %	hi	1.6 - 20	ASB5	5.635
Barium	23 / 23	100 %	hi	42.8 - 203	ASB003	95.57
Beryllium	23 / 23	100 %	hi	0.53 - 1.3	ASB2*	0.818
Cadmium	11 / 23	48 %	med	0.036 - 1.3	ASB5	0.64
Calcium	19 / 23	83 %	hi	220 - 18,000	ASB5	7,507
Chromium	23 / 23	100 %	hi	23 - 100	ASB5	44.25
Cobalt	23 / 23	100 %	hi	3.6 - 32.7	ASB009	14.8
Copper	23 / 23	100 %	hi	14 - 560	ASB4	326.5
Cyanide	6 / 11	55 %	hi	0.06 - 0.6	ASB5	0.294
Iron	23 / 23	100 %	hi	33,000 - 66,000	ASB4	46,160
Lead	23 / 23	100 %	hi	10.7 - 330	ASB5	110.8
Magnesium	23 / 23	100 %	hi	1,050 - 10,000	ASB5	4,722
Manganese	23 / 23	100 %	hi	117 - 2,400	ASB3	763.4
Mercury	23 / 23	100 %	hi	0.019 - 0.18	ASB010	0.0779
Nickel	23 / 23	100 %	hi	8.5 - 36	ASB2*	16.72
Potassium	23 / 23	100 %	hi	922 - 2,750	ASB2*	1,785
Selenium	11 / 22	50 %	hi	0.07 - 0.6	ASB2*	0.449
Silver	11 / 23	48 %	med	0.045 - 0.18	ASB5	0.0979
Sodium	11 / 23	48 %	med	41 - 546	ASB009	243.1
Thallium	11 / 23	48 %	med	0.15 - 0.48	ASB3	0.336
Vanadium	23 / 23	100 %	hi	42 - 98.2	ASB010	80.8
Zinc	23 / 23	100 %	hi	35.8 - 1,400	ASB5	418.5

[a] Detected constituents only are summarized here.

Data from two methods and data from duplicate samples were combined so that the higher detect and the lowest detection limit were used in the risk assessment dataset.

[b] The percent non-detects in each data set is indicated as low "*lo*" (15 percent or less), medium "*med*" (between 15 and 50 percent), or high "*hi*" (50 percent or more).

[c] The exposure point concentration (EPC) was set equal to the lower of the upper confidence limit on the mean (UCL) calculated by ProUCL 4.0 (USEPA, 2007) and the maximum concentration. Where a UCL was not calculable, the maximum concentration was used as the EPC.

m maximum used as the exposure point concentration.

mg/kg Milligrams per kilogram.

Table 5-3. Selection of Constituents of Potential Concern in Soil, AOC A - Area 31, Radford, VA

Constituent		Maximum Concentration (0-15 foot) (mg/kg)	Screening Levels (mg/kg) [a]				Screening Level Used [a]		Constituent of Potential Concern? [b]			
			Residential Scenario		Industrial Scenario		Residential Scenario (mg/kg)	Industrial Scenario (mg/kg)	Residential Scenario		Industrial Scenario	
			cancer (cRSL)	noncancer (ncRSL)	cancer (cRSL)	noncancer (ncRSL)			(Yes/no)	Rational	(Yes/no)	Rational
Explosives												
2,4-Dinitrotoluene		98	NA	12	NA	120	12	120	Yes	ASL	no	BSL
2,6-Dinitrotoluene		4.6	NA	6.1	NA	62	6.1	62	no	BSL	no	BSL
Dinitrotoluene mixture		102.6	0.71	12	2.5	120	0.71	2.5	Yes	ASL	Yes	ASL
Polychlorinated Biphenyls												
Aroclor 1242		0.015	0.22	NA	0.74	NA	0.22	0.74	no	BSL	no	BSL
Aroclor 1254		2.4	0.22	0.11	0.74	1.1	0.11	0.74	Yes	ASL	Yes	ASL
Organochlorine Pesticides												
Dieldrin		0.014	0.03	0.31	0.11	3.1	0.03	0.11	no	BSL	no	BSL
Volatile Organics												
Acetone		0.42	NA	6,100	NA	61,000	6,100	61,000	no	BSL	no	BSL
Benzene		0.013	1.1	9	5.6	47	1.1	5.6	no	BSL	no	BSL
Ethylbenzene		0.015	5.7	360	29	2,200	5.7	29	no	BSL	no	BSL
Methyl acetate		0.19	NA	7,800	NA	100,000	7,800	100,000	no	BSL	no	BSL
Methylene Chloride		0.1	11	170	54	940	11	54	no	BSL	no	BSL
Toluene		0.081	NA	500	NA	4,600	500	4,600	no	BSL	no	BSL
Xylenes (total)		0.1	NA	60	NA	260	60	260	no	BSL	no	BSL
Semivolatile Organics												
1,1'-Biphenyl		0.0022	NA	390	NA	5,100	390	5,100	no	BSL	no	BSL
2-Methylnaphthalene		0.0049	NA	31	NA	410	31	410	no	BSL	no	BSL
Acenaphthene		0.0066	NA	340	NA	3,300	340	3,300	no	BSL	no	BSL
Acenaphthylene	[c]	0.057	NA	340	NA	3,300	340	3,300	no	BSL	no	BSL
Anthracene		0.064	NA	1,700	NA	17,000	1,700	17,000	no	BSL	no	BSL
Benzo(a)anthracene		1.072	0.15	NA	2.1	NA	0.15	2.1	Yes	ASL	no	BSL
Benzo(a)pyrene		0.38	0.015	NA	0.21	NA	0.015	0.21	Yes	ASL	Yes	ASL
Benzo(b)fluoranthene		0.48	0.15	NA	2.1	NA	0.15	2.1	Yes	ASL	no	BSL
Benzo(g,h,i)perylene	[d]	0.28	NA	170	NA	1,700	170	1,700	no	BSL	no	BSL
Benzo(k)fluoranthene		0.38	1.5	NA	21	NA	1.5	21	no	BSL	no	BSL

Footnotes are on last page.

Table 5-3. Selection of Constituents of Potential Concern in Soil, AOC A - Area 31, Radford, VA

Constituent		Maximum Concentration (0-15 foot) (mg/kg)	Screening Levels (mg/kg) [a]				Screening Level Used [a]		Constituent of Potential Concern? [b]			
			Residential Scenario		Industrial Scenario		Residential Scenario (mg/kg)	Industrial Scenario (mg/kg)	Residential Scenario		Industrial Scenario	
			cancer (cRSL)	noncancer (ncRSL)	cancer (cRSL)	noncancer (ncRSL)			(Yes/no)	Rational	(Yes/no)	Rational
Bis(2-ethylhexyl)phthalate		5.7	35	120	120	1,200	35	120	no	BSL	no	BSL
Butylbenzylphthalate		0.24	NA	260	NA	910	260	910	no	BSL	no	BSL
Carbazole		0.077	24	NA	86	NA	24	86	no	BSL	no	BSL
Chrysene		0.66	15	NA	210	NA	15	210	no	BSL	no	BSL
Dibenzo(a,h)anthracene		0.29	0.015	NA	0.21	NA	0.015	0.21	Yes	ASL	Yes	ASL
Diethylphthalate		0.16	NA	4,900	NA	49,000	4,900	49,000	no	BSL	no	BSL
Dimethylphthalate		0.21	NA	NA	NA	NA	NA	NA	Yes	NSL	Yes	NSL
Di-n-Butylphthalate		410	NA	610	NA	6,200	610	6,200	no	BSL	no	BSL
Di-n-Octylphthalate		0.055	NA	NA	NA	NA	NA	NA	Yes	NSL	Yes	NSL
Fluoranthene		1.3	NA	230	NA	2,200	230	2,200	no	BSL	no	BSL
Fluorene		0.014	NA	230	NA	2,200	230	2,200	no	BSL	no	BSL
Indeno(1,2,3-cd)pyrene		0.39	0.15	NA	2.1	NA	0.15	2.1	Yes	ASL	no	BSL
N-Nitrosodiphenylamine		22	99	NA	350	NA	99	350	no	BSL	no	BSL
Pentachlorophenol		0.1	3	140	9	1,200	3	9	no	BSL	no	BSL
Phenanthrene	[e]	0.2	NA	1,700	NA	17,000	1,700	17,000	no	BSL	no	BSL
Pyrene		0.81	NA	170	NA	1,700	170	1,700	no	BSL	no	BSL
Inorganics												
Aluminum		42,300	NA	7,700	NA	99,000	7,700	99,000	Yes	ASL	no	BSL
Antimony		0.63	NA	3.1	NA	41	3.1	41	no	BSL	no	BSL
Arsenic		20	0.39	2.2	1.6	26	0.39	1.6	Yes	ASL	Yes	ASL
Barium		203	NA	1,500	NA	19,000	1,500	19,000	no	BSL	no	BSL
Beryllium		1.3	1400	16	6900	200	16	200	no	BSL	no	BSL
Cadmium		1.3	1800	7	9300	81	7	81	no	BSL	no	BSL
Calcium		18,000	NA	NA	NA	NA	NA	NA	no	EN	no	EN
Chromium	[f]	100	39	230	200	310	39	200	Yes	ASL	no	BSL
Cobalt		32.7	NA	2.3	NA	30	2.3	30	Yes	ASL	Yes	ASL
Copper		560	NA	310	NA	4,100	310	4,100	Yes	ASL	no	BSL
Cyanide		0.6	NA	160	NA	2,000	160	2,000	no	BSL	no	BSL
Iron		66,000	NA	5,500	NA	72,000	5,500	72,000	Yes	ASL	no	BSL
Lead	[g]	330	NA	NA	NA	NA	400	800	no	BSL	no	BSL

Footnotes are on last page.

Table 5-3. Selection of Constituents of Potential Concern in Soil, AOC A - Area 31, Radford, VA

Constituent		Maximum Concentration (0-15 foot) (mg/kg)	Screening Levels (mg/kg) [a]				Screening Level Used [a]		Constituent of Potential Concern? [b]			
			Residential Scenario		Industrial Scenario		Residential Scenario (mg/kg)	Industrial Scenario (mg/kg)	Residential Scenario		Industrial Scenario	
			cancer (cRSL)	noncancer (ncRSL)	cancer (cRSL)	noncancer (ncRSL)			(Yes/no)	Rational	(Yes/no)	Rational
Magnesium		10,000	NA	NA	NA	NA	NA	NA	no	EN	no	EN
Manganese		2,400	NA	180	NA	2,300	180	2,300	Yes	ASL	Yes	ASL
Mercury		0.18	NA	0.67	NA	2.8	0.67	2.8	no	BSL	no	BSL
Nickel	[h]	36	NA	160	NA	2,000	160	2,000	no	BSL	no	BSL
Potassium		2,750	NA	NA	NA	NA	NA	NA	no	EN	no	EN
Selenium		0.6	NA	39	NA	510	39	510	no	BSL	no	BSL
Silver		0.18	NA	39	NA	510	39	510	no	BSL	no	BSL
Sodium		546	NA	NA	NA	NA	NA	NA	no	EN	no	EN
Thallium		0.48	NA	0.51	NA	6.6	0.51	6.6	no	BSL	no	BSL
Vanadium		98.2	NA	39	NA	520	39	520	Yes	ASL	no	BSL
Zinc		1,400	NA	2,300	NA	31,000	2,300	31,000	no	BSL	no	BSL

[a] USEPA (2008) Regional Screening Level (RSL) for residential or industrial soil based on cancer risk of 1E-06 or noncancer hazard of 0.1.
The lowest of the cancer and the adjusted non-cancer RSL was used as the screening level.

[b] Constituent with maximum concentration exceeding the screening level and those with no screening level were considered COPCs unless they were essential human nutrients.

[c] Acenaphthene used as a surrogate for the RSL value.

[d] Pyrene used as a surrogate for the RSL value.

[e] Anthracene used as a surrogate for the RSL value.

[f] Chromium VI particulates used as a surrogate for the RSL value.

[g] Exposure to lead is assessed by estimating blood lead levels.

[h] Nickel "soluble salts" was used as a surrogate for the RSL value.

ASL	Above screening level.	mg/kg	Milligrams per kilogram.
BSL	Below screening level.	NA	Not available.
EN	Essential nutrient.	NSL	No screening level available.

Table 5-4. Summary of Toxicity Values and Target Sites AOC A - Area 31, Radford, VA

Constituent	Cancer		Non-Cancer		Target Site/Critical Effect	
	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Inh. Unit Risk $(ug/m^3)^{-1}$	Oral Ref. Dose (mg/kg-day)	Ref. Concentration (mg/m^3)	Oral	Inhalation
Explosives						
2,4-Dinitrotoluene	--	--	2.0E-03	--	CNS, blood	NA
Dinitrotoluene mixture	6.8E-01	--	--	--	NA	NA
Polychlorinated Biphenyls						
Aroclor 1254	2.0E+00	5.7E-04	2.0E-05	--	eye, nails, immune system	NA
Semivolatile Organic Compounds						
Benzo(a)anthracene	7.3E-01	1.1E-04	--	--	NR	NA
Benzo(a)pyrene	7.3E+00	1.1E-03	--	--	kidney	NA
Benzo(b)fluoranthene	7.3E-01	1.1E-04	--	--	liver, kidney, blood	NA
Dibenz(a,h)anthracene	7.3E+00	1.2E-03	--	--	NA	NA
Dimethylphthalate [a]	--	--	--	--	kidney	NA
Di-n-octylphthalate [a]	--	--	--	--	liver	NA
Indeno(1,2,3-cd)pyrene	7.3E-01	1.1E-04	--	--	kidney	NA
Inorganics						
Aluminum	--	--	1.0E+00	5.0E-03	developmental NS	NA
Arsenic	1.5E+00	4.3E-03	3.0E-04	3.0E-05	skin, vascular	NA
Chromium [b]	--	8.4E-02	3.0E-03	8.0E-06	NR	lung
Cobalt	--	9.0E-03	3.0E-04	6.0E-06	skin	NA
Copper	--	--	4.0E-02	--	GI	NA
Iron	--	--	7.0E-01	--	blood, liver, GI	NA
Manganese	--	--	1.4E-01	5.0E-05	CNS	CNS
Vanadium	--	--	5.0E-03	--	liver	NA

[a] RSLs were unavailable for these COPCs.

[b] Chromium VI particulates used as a surrogate for the RSL value.

CNS Central nervous system.

COPC Constituent of Potential Concern.

GI Gastrointestinal tract.

NA Not available.

NR Not Reported.

NS Nervous system.

Table 5-5. Preliminary Risk and Hazard Estimates for Commercial/Industrial Worker Exposure to Soil (0-1 foot), AOC A - Area 31, Radford, VA

Constituent	COPC? (Yes/no)	Exposure Point Concentration (mg/kg)	Screening Level (mg/kg) [a] cancer (cRSL)	Screening Level (mg/kg) [a] noncancer (ncRSL)	Preliminary Hazards and Risks [b] Carcinogenic Risk		Preliminary Hazards and Risks [b] Non-carcinogenic Hazard	
Explosives								
2,4-Dinitrotoluene	no	–	NA	1.20E+03	–		–	
Dinitrotoluene mixture	Yes	17.43	2.50E+00	1.20E+03	6.97E-06	42%	1.45E-02	7%
Polychlorinated Biphenyls								
Aroclor 1254	Yes	0.661	7.40E-01	1.10E+01	8.93E-07	5%	6.01E-02	30%
Semivolatile Organic Compounds								
Benzo(a)anthracene	no	–	2.10E+00	NA	–		–	
Benzo(a)pyrene	Yes	0.38 m	2.10E-01	NA	1.81E-06	11%	–	
Benzo(b)fluoranthene	no	–	2.10E+00	NA	–		–	
Dibenz(a,h)anthracene	Yes	0.29 m	2.10E-01	NA	1.38E-06	8%	–	
Dimethylphthalate	Yes	0.21 m	NA	NA	–		–	
Di-n-octylphthalate	Yes	0.055 m	NA	NA	–		–	
Indeno(1,2,3-cd)pyrene	no	–	2.10E+00	NA	–		–	
Inorganics								
Aluminum	no	–	NA	9.90E+05	–		–	
Arsenic	Yes	8.824	1.60E+00	2.60E+02	5.52E-06	33%	3.39E-02	17%
Chromium [c]	no	–	2.00E+02	3.10E+03	–		–	
Cobalt	Yes	10.83	NA	3.00E+02	–		3.61E-02	18%
Copper	no	–	NA	4.10E+04	–		–	
Iron	no	–	NA	7.20E+05	–		–	
Manganese	Yes	1,235	NA	2.30E+04	–		5.37E-02	27%
Vanadium	no	–	NA	7.20E+03	–		–	
Total hazard and risk					**2E-05**		**0.2**	
Total risk without Arsenic [d]					**1E-05**		**0.1**	

[a] USEPA (2008) Regional Screening Level (RSL) for a Industrial Scenario.

[b] Cancer risk = concentration x 1 x10^{-6} / cRSL; Noncancer hazard = concentration x 1 / ncRSL.

[c] Chromium VI particulates used as a surrogate for the RSL value.

[d] Metals detected within background are not considered to represent site-related afftects. Therefore, this calculation excludes risks and hazards associated with arsenic, cobalt, manganese and vanadium.

– Not applicable. mg/kg Milligrams per kilogram. NA Not available.

COPC Constituent of Potential Concern. m EPC is based on maximum concentration

Table 5-6. Preliminary Risk and Hazard Estimates for Hypothetical Future Residential Exposure to Surface Soil (0-1 foot), AOC A - Area 31, Radford, VA

Constituent	COPC? (Yes/no)	Exposure Point Concentration (mg/kg)	Screening Level (mg/kg) [a] cancer (cRSL)	Screening Level (mg/kg) [a] noncancer (ncRSL)	Preliminary Hazards and Risks [b] Carcinogenic Risk		Preliminary Hazards and Risks [b] Non-carcinogenic Hazard		Target Site/Critical Effect Oral	Target Site/Critical Effect Inhalation
Explosives										
2,4-Dinitrotoluene	Yes	16.57	NA	1.20E+02	–		1.38E-01	3%	CNS, blood	NA
Dinitrotoluene mixture	Yes	17.43	7.10E-01	1.20E+02	2.45E-05	23%	1.45E-01	3%	NA	NA
Polychlorinated Biphenyls										
Aroclor 1254	Yes	0.661	2.20E-01	1.10E+00	3.00E-06	3%	6.01E-01	14%	eye, nails, immune system	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	Yes	1.072 m	1.50E-01	NA	7.15E-06	7%	–		NR	NA
Benzo(a)pyrene	Yes	0.38 m	1.50E-02	NA	2.53E-05	23%	–		kidney	NA
Benzo(b)fluoranthene	Yes	0.48 m	1.50E-01	NA	3.20E-06	3%	–		liver, kidney, blood	NA
Dibenz(a,h)anthracene	Yes	0.29 m	1.50E-02	NA	1.93E-05	18%	–		NA	NA
Dimethylphthalate	Yes	0.21 m	NA	NA	–		–		kidney	NA
Di-n-octylphthalate	Yes	0.055 m	NA	NA	–		–		liver	NA
Indeno(1,2,3-cd)pyrene	Yes	0.39 m	1.50E-01	NA	2.60E-06	2%	–		kidney	NA
Inorganics										
Aluminum	Yes	35,128	NA	7.70E+04	–		4.56E-01	11%	developmental NS	NA
Arsenic	Yes	8.824	3.90E-01	2.20E+01	2.26E-05	21%	4.01E-01	9%	skin, vascular	NA
Chromium [c]	Yes	54.79	2.80E+02	2.30E+02	1.96E-07	<1%	2.38E-01	6%	NR	lung
Cobalt	Yes	10.83	NA	2.30E+01	–		4.71E-01	11%	skin	NA
Copper	Yes	231.1	NA	3.10E+03	–		7.45E-02	2%	GI	NA
Iron	Yes	50,449	NA	5.50E+04	–		9.17E-01	21%	blood, liver, GI	NA
Manganese	Yes	1,235	NA	1.80E+03	–		6.86E-01	16%	CNS	CNS
Vanadium	Yes	84.27	NA	5.50E+02	–		1.53E-01	4%	liver	NA
Total hazard and risk					**1E-04**		**4**			
Total risk excluding metals within background levels [d]					**9E-05**		**3**	**		

** HI Segregated by Target Site/Critical Effect [d]:

HI (liver) =	0.9	HI (skin, vascular) =	--
HI (eye) =	0.6	HI (immune system) =	0.6
HI (CNS) =	0.1	HI (nails) =	0.6
HI (blood) =	1	HI (fetus, developmental) =	0.5
HI (GI) =	1	HI (NA, NR) =	0.4

[a] USEPA (2008) Regional Screening Level (RSL) for a Residential Scenario.

[b] Cancer risk = concentration x 1 x10^{-6} / cRSL; Noncancer hazard = concentration x 1 / ncRSL.

[c] Chromium VI particulates used as a surrogate for the RSL value.

[d] Metals detected within background are not considered to represent site-related afftects. Therefore, this calculation excludes risks and hazards associated with arsenic, cobalt, manganese and vanadium.

–	Not applicable.	mg/kg	Milligrams per kilogram.
COPC	Constituent of Potential Concern.	NA	Not available.
CNS	Central nervous system.	NR	Not Reported.
GI	Gastrointestinal tract.	NS	Nervous system.
m	EPC is based on maximum concentration		

Table 5-7. Preliminary Risk and Hazard Estimates for Hypothetical Future Residential Exposure to Combined Surface and Subsurface Soil (0-15 foot), AOC A - Area 31, Radford, VA

Constituent	COPC? (Yes/no)	Exposure Point Concentration (mg/kg)	Screening Level (mg/kg) [a] cancer (cRSL)	Screening Level (mg/kg) [a] noncancer (ncRSL)	Preliminary Hazards and Risks [b] Carcinogenic Risk		Preliminary Hazards and Risks [b] Non-carcinogenic Hazard		Target Site/Critical Effect Oral	Target Site/Critical Effect Inhalation
Explosives										
2,4-Dinitrotoluene	Yes	7.631	NA	1.20E+02	–		6.36E-02	2%	CNS, blood	NA
Dinitrotoluene mixture	Yes	8.048	7.10E-01	1.20E+02	1.13E-05	13%	6.71E-02	2%	NA	NA
Polychlorinated Biphenyls										
Aroclor 1254	Yes	0.341	2.20E-01	1.10E+00	1.55E-06	2%	3.10E-01	9%	eye, nails, immune syster	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	Yes	1.072 m	1.50E-01	NA	7.15E-06	8%	–		NR	NA
Benzo(a)pyrene	Yes	0.38 m	1.50E-02	NA	2.53E-05	30%	–		kidney	NA
Benzo(b)fluoranthene	Yes	0.48 m	1.50E-01	NA	3.20E-06	4%	–		liver, kidney, blood	NA
Dibenz(a,h)anthracene	Yes	0.29 m	1.50E-02	NA	1.93E-05	23%	–		NA	NA
Dimethylphthalate	Yes	0.21 m	NA	NA	–		–		kidney	NA
Di-n-octylphthalate	Yes	0.055 m	NA	NA	–		–		liver	NA
Indeno(1,2,3-cd)pyrene	Yes	0.39 m	1.50E-01	NA	2.60E-06	3%	–		kidney	NA
Inorganics										
Aluminum	Yes	34,344	NA	7.70E+04	–		4.46E-01	13%	developmental NS	NA
Arsenic	Yes	5.635	3.90E-01	2.20E+01	1.44E-05	17%	2.56E-01	7%	skin, vascular	NA
Chromium [c]	Yes	44.25	2.80E+02	2.30E+02	1.58E-07	<1%	1.92E-01	6%	NR	lung
Cobalt	Yes	14.8	NA	2.30E+01	–		6.43E-01	18%	skin	NA
Copper	Yes	326.5	NA	3.10E+03	–		1.05E-01	3%	GI	NA
Iron	Yes	46,160	NA	5.50E+04	–		8.39E-01	24%	blood, liver, GI	NA
Manganese	Yes	763.4	NA	1.80E+03	–		4.24E-01	12%	CNS	CNS
Vanadium	Yes	80.8	NA	5.50E+02	–		1.47E-01	4%	liver	NA
Total hazard and risk					**9E-05**		**3**			
Total risk excluding metals within background levels [d]					**7E-05**		**2**	**		

** HI Segregated by Target Site/Critical Effect [d]:

HI (liver) =	0.8	HI (skin, vascular) =	--
HI (eye) =	0.3	HI (immune system) =	0.3
HI (CNS) =	0.1	HI (nails) =	0.3
HI (blood) =	0.9	HI (fetus, developmental) =	0.4
HI (GI) =	0.9	HI (NA, NR) =	0.3

[a] USEPA (2008) Regional Screening Level (RSL) for a Residential Scenario.

[b] Cancer risk = concentration x 1 x10^{-6} / cRSL; Noncancer hazard = concentration x 1 / ncRSL.

[c] Chromium VI particulates used as a surrogate for the RSL value.

[d] Metals detected within background are not considered to represent site-related afftects. Therefore, this calculation excludes risks and hazards associated with arsenic, cobalt, manganese and vanadiu

–	Not applicable.	mg/kg	Milligrams per kilogram.
COPC	Constituent of Potential Concern.	NA	Not available.
CNS	Central nervous system.	NR	Not Reported.
GI	Gastrointestinal tract.	NS	Nervous system.
m	EPC is based on maximum concentration		

Table 5-8. Summary of Calculated Risks and Hazards, AOC A - Area 31, Radford, VA

RECEPTOR Exposure Medium - Scenario	Calculation Table	Total Excess Lifetime Cancer Risk	Total Non-Cancer Hazard	
Commercial/Industrial Worker				
Soil (0-1 foot depth interval)	Table 5-5	2E-05	0.20	
Site-Related Constituents		1E-05	0.07	
Hypothetical Future Resident (Surface Soil)				
Soil (0-1 foot depth interval)	Table 5-6	1E-04	4	
Site-Related Constituents		9E-05	3	*

* HI for 0-1 foot depth interval segregated by target site/critical Effect:

HI (liver) =	1	HI (skin, vascular) =	--
HI (eye) =	0.6	HI (immune system) =	0.6
HI (CNS) =	0.1	HI (nails) =	0.6
HI (blood) =	1	HI (fetus, developmental) =	0.5
HI (GI) =	1	HI (NA, NR) =	0.4

Hypothetical Future Resident (Combined Surface and Subsurface Soil)				
Soil (0-15 foot depth interval)	Table 5-7	9E-05	3.5	
Site-Related Constituents		7E-05	2.0	**

** HI for 0-15 foot depth interval segregated by target site/critical effect:

HI (liver) =	1	HI (skin, vascular) =	--
HI (eye) =	0.3	HI (immune system) =	0.3
HI (CNS) =	0.1	HI (nails) =	0.3
HI (blood) =	1	HI (fetus, developmental) =	0.4
HI (GI) =	0.9	HI (NA, NR) =	0.3

Figures



0 2,000 4,000

SCALE: 1"=2,000'

SOURCE: USGS 7.5 MIN. TOPOGRAPHICAL QUADRANGLE: RADFORD NORTH, VIRGINIA 2000

US ARMY
RADFORD ARMY AMMUNITION PLANT
RFI REPORT
RAAP-31 (AOC-A): NITROCELLULOSE RAINWATER DITCH

SITE LOCATION

ARCADIS

FIGURE
1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\APROJECT\RAAP\CADD\RAAP-031\Supplemental Workplan\FIG-1 SITELOCATION MAP.dwg LAYOUT: 1 SAVED: 3/2/2009 9:36 AM ACADVER: 17.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS(SIZE A-B).CTB PLOTTED: 3/2/2009 9:40 AM BY: WASILEWSKI, MATT
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BASEMAP-2008-0425 ARCADIS Color Logo.JPG
Radford_North_O3708B5_geo-001.jpg
ARCADIS Color Logo.JPG

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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BASEMAP-2008-0422 ARCADIS Color Logo.JPG
ARCADIS Color Logo.JPG

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D-1546
B-3553
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RAAP-031
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COOLING
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1500
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6201
A-204-10
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1034
1042
1039
204-2
GA-2
221-16
T-2018
1025
2025
2051
52
A1025
A1020
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2020
2053
A2020
472

LEGEND:

AOC A APPROXIMATE BOUNDARY

EXISTING CONCRETE LINED DITCH

0 100
SCALE: 1"=100'

US ARMY
RADFORD ARMY AMMUNITION PLANT
RFI REPORT
RAAP-31 (AOC-A): NITROCELLULOSE RAINWATER DITCH

SITE LAYOUT

ARCADIS

FIGURE
2

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\APROJECT\RAAP\CADD\RAAP-031\Supplemental Workplan\FIG-3 SOIL SAMPLE LOCATIONS.dwg LAYOUT: 3 SAVED: 3/3/2009 9:59 AM ACADVER: 17.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS(SIZE A-B).CTB PLOTTED: 3/3/2009 9:59 AM BY: WASILEWSKI, MATT
XREFS: IMAGES: PROJECTNAME: ----
BASEMAP-2008-0422 ARCADIS Color Logo.JPG
ARCADIS Color Logo.JPG

1783.3

ASB11

N

ASB9

M.H.

ASB8

M.H.

ASB10

ASB5

ASB12

ASB13

1787.9

M.H.

ASB14

ASB3A

ASB7

ASB15

ASB3

ASB16

ASB17

ASB6

1796.9

ASB4A

ASB4

ASB2

1789.4

ASB18

1796.4

ASB19

ASB1

1796.7

LEGEND:

- AOC A APPROXIMATE BOUNDARY
- ABOVE-GROUND PIPING
- EXISTING CONCRETE LINED DITCH
- ASB2 BORING LOCATION (OCTOBER 2003)
- ASB4 BORING LOCATION (APRIL 2006)
- ASB7 BORING LOCATION (JUNE 2008)
- ASB17 BORING LOCATION (DECEMBER 2008)
- ASB3 LOCATION RESAMPLED (JUNE 2008)

0 20
SCALE: 1"=20'

US ARMY
RADFORD ARMY AMMUNITION PLANT
RFI REPORT
RAAP-31 (AOC-A): NITROCELLULOSE RAINWATER DITCH

SOIL SAMPLE LOCATIONS

ARCADIS

FIGURE
3

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\APROJECTR\AAPIC\ADD\RAAP-031Supplemental Workplan\FIG-4 SUMMARY OF CONSTITUENTS IN SOIL EXCEEDING SCREENING LEVELS.dwg
3/20/2009 8:50 AM BY: WASILEWSKI, MATT LAYOUT: 4 SAVED: 3/20/2009 8:47 AM ACADVER: 17.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS(SIZE A-B).CTB PLOTTED:
XREFS: PROJECTNAME: ---
BASEMAP-2008-09-22 IMAGES:
ARCADIS Color Logo.JPG
ARCADIS Color Logo.JPG

ASB9		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	6/30/2008	6/30/2008
PCBs		
Aroclor-1254	**0.20 J**	<0.022
Inorganics		
Arsenic	6.40	2.80
Cobalt	5.40	32.7

ASB10		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	6/30/2008	6/30/2008
Inorganics		
Arsenic	6.30	3.60

A31-SB012		
Depth(Feet)	(1 - 2)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

A31-SB014		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
SVOCs		
Dinitrotoluene Mix	**0.50 J**	<0.42

ASB3				
Depth(Feet)	(0 - 1)	(0 - 1)	(6 - 8)	(13 - 14.7)
Date	10/11/2003	6/30/2008	10/11/2003	10/11/2003
Explosives				
2,4-Dinitrotoluene	**20**	NA	<0.5	<0.5
Dinitrotoluene Mix	**20**	NA	<1	<1
PCBs				
Aroclor-1254	NA	**2.4 J**	NA	NA
SVOCs				
2,4-Dinitrotoluene	**28 J**	**98**	0.023 J	<0.20
2,6-Dinitrotoluene	**3.3 J**	**4.6 J**	<0.21	<0.20
Di-n-Butylphthalate	130	**410 J**	0.32	0.32
Dinitrotoluene Mix	**31 J**	**100 J**	**0.023 J**	<0.20
N-Nitrosodiphenylamine	**4.7 J**	**22 J**	0.0080 J	<0.20
Inorganics				
Arsenic	1.90	4.90	1.60	2.20
Manganese	2,400	397	483	330

A31-SB015		
Depth(Feet)	(2 - 3)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

A31-SB003A		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

A31-SB017		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

A31-SB004A		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

ASB4			
Depth(Feet)	(0 - 1)	(10 - 11)	(20)
Date	4/20/2006	4/20/2006	4/20/2006
Organochlorine Pesticides			
Dieldrin	**0.014 J [0.0032 J]**	**0.0046 J**	<0.03
Inorganics			
Arsenic	2.00 ,J [1.70 ,J]	1.60 ,J	4.20 ,J
Cobalt	6.20 ,J [6.20 ,J]	6.30 ,J	33.0 ,J

A31-SB019		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

A31-SB011	
Depth(Feet)	(0 - 1)
Date	12/30/2008
All Analytes	< screening levels

ASB5			
Depth(Feet)	(0 - 1)	(0 - 1)	(7)
Date	4/20/2006	6/30/2008	4/20/2006
Explosives			
Dinitrotoluene Mix	**1.55 J**	NA	<1
PCBs			
Aroclor-1254	**2.4**	**1.2 J [0.34 J]**	**0.16**
SVOCs			
2,4-Dinitrotoluene	**11**	**2.8 J [7.3 J]**	<0.047
Benzo(a)anthracene	0.072	**<0.17 J [0.45 J]**	<0.023
Benzo(a)pyrene	0.022	<0.17 J [0.38 J]	<0.023
Dibenzo(a,h)anthracene	NA	<0.17 [0.29]	NA
Dinitrotoluene Mix	**12**	**3.0 J [7.7 J]**	<0.047
Inorganics			
Arsenic	20.0 ,J	10.4 [11.0]	1.80 ,J

ASB8		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	6/30/2008	6/30/2008
Inorganics		
Arsenic	4.20	3.30

A31-SB013		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

ASB7		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	6/30/2008	6/30/2008
SVOCs		
Dinitrotoluene Mix	**0.31 J**	<0.50
Inorganics		
Arsenic	4.60	3.60

A31-SB016		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

ASB6		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	6/30/2008	6/30/2008
Inorganics		
Arsenic	3.60	2.30

ASB2			
Depth(Feet)	(0 - 1)	(10 - 12)	(21 - 23)
Date	10/11/2003	10/11/2003	10/11/2003
Explosives			
Dinitrotoluene Mix	<1	<1 [<1]	**0.2 J**
SVOCs			
Dinitrotoluene Mix	**0.10 J**	<0.22 [<0.22]	<0.23
Inorganics			
Arsenic	2.90	3.40 [4.70]	4.50

A31-SB018		
Depth(Feet)	(0 - 1)	(5 - 6)
Date	12/30/2008	12/30/2008
All Analytes	< screening levels	< screening levels

ASB1			
Depth(Feet)	(0 - 1)	(10 - 12)	(26 - 28)
Date	10/11/2003	10/11/2003	10/11/2003
SVOCs			
Dinitrotoluene Mix	**0.93 J**	<0.22	<0.22
Inorganics			
Arsenic	3.00	1.80	8.10

ASB11 ASB9 ASB8 ASB10 ASB5 ASB12 ASB13 ASB14 ASB3A ASB7 ASB15 ASB3 ASB16 ASB17 ASB6 ASB4A ASB4 ASB2 ASB18 ASB19 ASB1

EXISTING CONCRETE LINED DITCH
(APPROXIMATE LOCATION)

N

0 30
SCALE: 1"=30'

LEGEND:

- AOC A APPROXIMATE BOUNDARY
- ABOVE-GROUND PIPING
- EXISTING CONCRETE LINED DITCH
- ASB2 ● BORING LOCATION (OCTOBER 2003)
- ASB4 ⊠ BORING LOCATION (APRIL 2006)
- ASB7 ☆ BORING LOCATION (JUNE 2008)
- ASB17 ▲ BORING LOCATION (DECEMBER 2008)
- ASB3 □ LOCATION RESAMPLED (DECEMBER 2008)
- NA NOT ANALYZED
- [0.29] DUPLICATE SAMPLE RESULT
- 0.34 J ESTIMATED CONCENTRATION
- RSL REGIONAL SCREENING LEVEL
- SSL SOIL SCREENING LEVEL
- **2.4 J** BOLD INDICATES CONCENTRATION ABOVE SOIL TO GROUNDWATER SSL (DAF-20)
- 32.7 SHADED INDICATES CONCENTRATION ABOVE RSL FOR INDUSTRIAL SOIL

ALL CONCENTRATIONS IN MILLIGRAMS PER KILOGRAMS

COMPOUND	RSL for industrial soil	Soil to Groundwater SSL
2,4-Dinitrotoluene	1,200	1.36
2,6-Dinitrotoluene	620	0.68
Aroclor-1254	0.74	0.102
Arsenic	1.6	--
Benzo(a)anthracene	2.1	0.28
Benzo(a)pyrene	0.21	6.2
Cobalt	30	--
Dibenzo(a,h)anthracene	0.21	0.3
Dieldrin	0.11	0.0018
Di-n-Butylphthalate	6,200	220
Dinitrotoluene Mix	2.5	0.0019
N-Nitrosodiphenylamine	350	3.4
Manganese	2300	--

US ARMY
RADFORD ARMY AMMUNITION PLANT
RFI REPORT
RAAP-31(AOC-A): NITROCELLULOSE RAINWATER DITCH

CONSTITUENTS IN SOIL GREATER THAN SCREENING LEVELS

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FIGURE
4

Appendix A

Soil Sampling Logs

Project: Radford Army Ammunition Plant- SSP Project Location: Radford, Virginia Project Number: 09604-317	Log of Borehole ASB1 Sheet 1 of 1

Date(s) Drilled	10-11-03 0830-1000	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Geoprobe - Direct Push Technology	Drilling Contractor	Richard Simmons Drilling	Total Depth of Borehole	32.0 feet
Drill Rig Type	Tractor- Mounted Geoprobe	Drill Bit Size/Type	4 ft x 2 in Rectractable Macrocore Sampler	Ground Surface Elevation	
Groundwater Level(s)	28.0 ft bgs during drilling	Sampling Method	4 ft x 2 in Macrocore Sampler with Liner	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CL/CH	7.5YR 5/8 strong brown, Clay with trace silt, moist, stiff, moderately plastic	Sample ASB1A collected 0.0-1.0 ft bgs
			1	4.0	ND		SM/ML	5YR 5/8 yellowish red, Sand and Silt, moist, micaceous, loose	
	5							Decreasing sand with depth to 6.5 ft bgs	
			2	4.0	ND				
							ML	5YR 4/6 yellowish red, Silt, moist, micaceous, moderately stiff	
	10		3	2.5	ND				Sample ASB1B collected 10.0-12.0 ft bgs
							SM	5YR 4/4 reddish brown, Silty Sand, fine, moist, micaceous	
							SC/SM	5YR 5/6 yellowish red, Sand, fine to medium, some clay and silt, moist	
			4	2.1	ND				
	15						GM/GC	7.5YR 5/6 strong brown, Gravel with sand, silt, and clay, moist	
			5	4.0	ND				
							ML	5YR 4/4 reddish brown, Sandy Silt, fine, trace fine gravel, moist, soft, micaceous	
	20							Moisture increases with depth	
			6	4.0	ND				
	25								
			7	3.0	ND				Sample ASB1C collected 26.0-28.0 ft bgs
								Not Recovered; Macrocore sampler very wet when retrieved	
	30		8	0.0	ND		NR	Groundwater at 28.0 ft bgs	
								Boring terminated 32.0 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 ASB1

URS

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 09604-317

Log of Borehole ASB2

Sheet 1 of 1

Date(s) Drilled	10-11-03 1000-1115	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Geoprobe - Direct Push Technology	Drilling Contractor	Richard Simmons Drilling	Total Depth of Borehole	24.0 feet
Drill Rig Type	Tractor- Mounted Geoprobe	Drill Bit Size/Type	4 ft x 2 in Rectractable Macrocore Sampler	Ground Surface Elevation	
Groundwater Level(s)	23.0 ft bgs during drilling	Sampling Method	4 ft x 2 in Macrocore Sampler with Liner	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CL/CH	7.5YR 5/8 strong brown, Clay with silt and fine sand, moist, moderately plastic	Sample ASB2A collected 0.0-1.0 ft bgs
			1	3.6	ND		SM	7.5YR 5/8 strong brown, Silty Sand, fine, moist, loose	
	5		2	3.4	ND		ML	5YR 4/6 yellowish red, Sandy Silt, very fine, moist, moderately stiff, micaceous	
	10		3	3.6	ND		GM	7.5YR 6/6 reddish yellow, Silty Gravel, moist, hard to very hard, medium coarse gravel very dense 10.0-12.0 ft bgs	Sample ASB2B and SBD10 collected 10.0-12.0 ft bgs
			4	4.0	ND		ML	10YR 6/6 brownish yellow mottled with 2.5YR 4/6 red, Silt with medium sand and fine gravel, moist, moderately dense, low plasticity 2.5YR 4/6 red grades out with depth	
	15		5	4.0	ND		ML	10YR 6/8 brownish yellow, Silt with clay, moist Hardness grades softer and moisture increases with depth	
	20		6	4.0	ND			Groundwater at 23.0 ft bgs	Sample ASB2C, MS, MSD collected 21.0-23.0 ft bgs
	25							Boring terminated 24.0 ft bgs	
	30								

URS

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 ASB2

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 09604-317

Log of Borehole ASB3

Sheet 1 of 1

Date(s) Drilled	10-11-03 1200-1230	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Geoprobe - Direct Push Technology	Drilling Contractor	Richard Simmons Drilling	Total Depth of Borehole	14.7 feet
Drill Rig Type	Tractor- Mounted Geoprobe	Drill Bit Size/Type	4 ft x 2 in Rectractable Macrocore Sampler	Ground Surface Elevation	
Groundwater Level(s)	NA	Sampling Method	4 ft x 2 in Macrocore Sampler with Liner	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CL/ML	7.5YR 5/8 strong brown, Clay with silt and fine sand, moist, moderately stiff, moderately plastic	Sample ASB3A collected 0.0-1.0 ft bgs
			1	3.7	ND		SM/SC	5YR 4/6 yellowish red mottled with 5YR 3/3 dark reddish brown, Silty Sand with some clay, moist, micaceous	
	5		2	3.6	ND		ML	5YR 3/3 dark reddish brown, Silt, moist, saprolitic texture, hard	Sample ASB3B collected 6.0-8.0 ft bgs
							SM/SC	7.5YR 5/8 strong brown, Silty Sand with some clay, fine to medium, moist, micaceous	
	10		3	3.0	ND		GP	7.5YR 5/8 strong brown, Sandy Gravel with some silt and clay, fine to medium, moist	
							SM/GP	5YR 4/6 yellowish red, Silty Sand, fine to medium, with some fine to medium gravel, moist, micaceous	
			4	2.0	ND		GM	5YR 4/6 yellowish red, Silty Gravel, moist	Sample ASB3C collected 13.0-14.7 ft bgs
	15							Boring Refusal 14.7 ft bgs	
	20								
	25								
	30								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 ASB3

URS

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 11656628

Log of Borehole ASB4

Sheet 1 of 1

Date(s) Drilled	**4-19-06**	Logged By	**J. Spangler**	Reviewed By	**B. Fisher**
Drilling Method	**Geoprobe - Direct Push Technology**	Drilling Contractor	**Parratt Wolff**	Total Depth of Borehole	**32.0 feet**
Drill Rig Type	**Truck - Mounted Geoprobe**	Drill Bit Size/Type	**4 ft x 2 in Rectractable Macrocore Sampler**	Ground Surface Elevation	
Groundwater Level(s)	**20**	Sampling Method	**4 ft x 2 in Macrocore Sampler with Liner**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/2 dark brown, very fine sandy SILT, some clay, moist grades to fine silty sand at 0.6. At 0.6 1/2" green stain	
			1	4.0				7.5YR 5/8 very fine SAND, silty, micaceous, moist	11:30 Chemical Sample ASB4-A plus Dup-1 taken
	5		2	4.0			SM	Sitly SAND, sand is fine	
	10		3	4.0				Sitly SAND, sand is fine	12:00 Chemical Sample ASB4-B taken
							GM	7.5YR 5/6 GRAVEL, sandy and silty, gravel is fine to medium rounded, with fine to coarse sand and silt, moist, with occasional, reddish yellow lenses	
			4	4.0				10YR 5/6 yellow brown SILT, fine sandy silt, some clay moist very moist/very soft	
	15							Medium dense silty CLAY with very fine sandy clay	
			5	4.0				10YR 5/6 yellowish brown, slightly clayey SILT, soft, moist, trace very fine sand	
	20							▽	12:25 Chemical Sample ASB4-C taken
			6	0.0			SC		
	25		7	0.0					
	30		8	0.0					
								Boring Terminated at 32.0 ft bgs.	

URS

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 1/11/2007 ASB4

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 11656628

Log of Borehole ASB5

Sheet 1 of 1

Date(s) Drilled	**4-19-06**	Logged By	**J. Spangler**	Reviewed By	**B. Fisher**
Drilling Method	**Geoprobe - Direct Push Technology**	Drilling Contractor	**Parratt Wolff**	Total Depth of Borehole	**7.0 feet**
Drill Rig Type	**Truck - Mounted Geoprobe**	Drill Bit Size/Type	**4 ft x 2 in Rectractable Macrocore Sampler**	Ground Surface Elevation	
Groundwater Level(s)		Sampling Method	**4 ft x 2 in Macrocore Sampler with Liner**	Hammer Data	**NA**
Borehole Backfill	**Bentonite Pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						GM	7.5YR 4/2 brown, fine SAND, silty, moist, medium dense gravels at surface	
	1							7.5YR 5/8 strong brown, fine sandy CLAY, silty, moist, trace gravels	13:30 Chemical Sample ASB5A taken
	2		1	4.0					
	3								
	4						CL		
	5								
	6		2	3.0					
	7							Boring Refusal at 7.0 ft bgs at possible gravel zone.	13:50 Chemical Sample ASB5B taken
	8								
	9								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 1/11/2007 ASB5

URS

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Sample/Core Log

Boring/Well **ASB-3** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 6/30/2008 17:25 Drilling Completed 6/30/2008 17:30

Total Depth Drilled 1 Foot Hole Diameter 1.75 inches Soil Samples Collected ASB003(0-1) at 17:30

Length and Diameter of Coring Device 4 feet / 1.75 inches

Land-Surface Elev. N/A feet ☐ Surveyed Other 3-foot strokes used to increase recovery volume

Drilling Fluid Used N/A Drilling Method Hand Auger

Drilling Contractor Columbia Technologies Driller Josh Ketchum Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1	1	0.0	0 - 1.8' brown, SILT and fine SAND, little gravel, trace fill material, moist.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-5** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 6/30/2008 17:10 Drilling Completed 6/30/2008 17:15

Total Depth Drilled 1 Foot Hole Diameter 1.75 inches Soil Samples Collected ASB005(0-1)* at 17:15

*ASBDUP001(0-1) at 17:15

Length and Diameter of Coring Device 4 feet / 1.75 inches

Land-Surface Elev. N/A feet ☐ Surveyed Other 3-foot strokes used to increase recovery volume

Drilling Fluid Used N/A Drilling Method Hand Auger

Drilling Contractor Columbia Technologies Driller Josh Ketchum Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1	1	0.0	0 - 1.8' reddish brown, SILT, root hairs present, trace sand and gravel, moist.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-7** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 6/30/2008 16:30 Drilling Completed 6/30/2008 16:40

Total Depth Drilled 6 Feet Hole Diameter 1.75 inches Soil Samples Collected ASB007(0-1) at 16:35

ASB007(5-6) at 16:40

Length and Diameter of Coring Device 4 feet / 1.75 inches

Land-Surface Elev. N/A feet ☐ Surveyed Other 3-foot strokes used to increase recovery volume

Drilling Fluid Used N/A Drilling Method Geoprobe

Drilling Contractor Columbia Technologies Driller Josh Ketchum Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	3	3	0.0	0 - 1' reddish brown, SILT and CLAY, trace fine sand, root hairs present, stiff, dry.
				1 - 3' reddish brown, SILT and CLAY, trace fine sand, root hairs present, trace black staining, very stiff, crumbly, dry.
3	6	3	0.0	0 - 3' yellowish brown, mottled, SILT, little clay, trace fine sand, trace black speckles 1-3', stiff.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well	**ASB-9**	Project/No.	Radford Army Ammunition Plant / GP08RAAP.0031.DF000			Page	1 of 1
Site Location	Radford, VA			Drilling Started	6/30/2008 16:00	Drilling Completed	6/30/2008 16:10
Total Depth Drilled	6 Feet	Hole Diameter	1.75 inches			Soil Samples Collected	ASB009(0-1)* at 16:05
							*MS/MSD
Length and Diameter of Coring Device	4 feet / 1.75 inches						ASB009(5-6) at 16:10
Land-Surface Elev.	N/A feet	☐ Surveyed		Other	3-foot strokes used to increase recovery volume		
Drilling Fluid Used	N/A					Drilling Method	Geoprobe
Drilling Contractor	Columbia Technologies			Driller	Josh Ketchum	Helper	--
Prepared By	Sandra Grabowski			Hammer Weight	--	Hammer Drop	-- ins.

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	3	2.8	0.0	0 - 1.8' medium brown, SILT and CLAY, trace sand, gravel, and road bed material,
				very stiff.
			0.0	1.8 - 2.8' reddish brown, SILT, trace fine sand, moist.
3	6	3	0.0	0 - 3' reddish brown, SILT, trace fine sand, moist.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-8** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 6/30/2008 16:20 Drilling Completed 6/30/2008 16:30

Total Depth Drilled 6 Feet Hole Diameter 1.75 inches Soil Samples Collected ASB008(0.5-1.5) at 16:25

ASB008(5-6) at 16:30

Length and Diameter of Coring Device 4 feet / 1.75 inches

Land-Surface Elev. N/A feet ☐ Surveyed Other 3-foot strokes used to increase recovery volume

Drilling Fluid Used N/A Drilling Method Geoprobe

Drilling Contractor Columbia Technologies Driller Josh Ketchum Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	3	3	0.0	0 - 0.5' top soil, asphalt, and roadbed material.
				0.5 - 3' reddish brown, SILT and CLAY, trace fine micacous sand, very stiff.
3	6	3	0.0	0 - 1' reddish brown, SILT and CLAY, trace fine micacous sand, very stiff.
				1 - 3' reddish brown, SILT, some fine micacous sand, medium stiff, crumbly, moist.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-10** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 6/30/2008 15:45 Drilling Completed 6/30/2008 15:55

Total Depth Drilled 6 Feet Hole Diameter 1.75 inches Soil Samples Collected ASB010(0-1) at 15:50

ASB010(5-6) at 15:55

Length and Diameter of Coring Device 4 feet / 1.75 inches

Land-Surface Elev. N/A feet ☐ Surveyed Other 3-foot strokes used to increase recovery volume

Drilling Fluid Used N/A Drilling Method Geoprobe

Drilling Contractor Columbia Technologies Driller Josh Ketchum Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	3	3	0.0	0 - 1.5' reddish brown, SILT and CLAY, trace fine sand, root hairs present, very stiff.
				1.5 - 3' reddish brown mottled SILT and CLAY, trace fine micacous sand, dry, very stiff.
3	6	3	0.0	0 - 0.5' reddish brown mottled SILT and CLAY, trace fine micacous sand, dry, very stiff.
				0.5 - 3' orange brown, SILT, trace fine sand, medium stiff, moist.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-3A** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 10:50 Drilling Completed 12/30/2008 11:00

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB003A(0-1) at 8:40

A31-SB003A(5-6) at 11:00

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1*	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, low to medium plasticity.
(*collected by hand auger)				
1	4	2.4	NA	0 - 2.4' red orange CLAY and SILT, little fine to medium sand, trace mica, dry, stiff,
				low to medium plasticity.
4	8	2.5	NA	0 - 2.5' red orange CLAY and SILT, little fine to medium sand, trace mica, dry, stiff,
				low to medium plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-4A** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 10:00 Drilling Completed 12/30/2008 10:10

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB004A(0-1) at 8:50

A31-SB004A(5-6) at 10:10

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1*	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, low to medium plasticity.
(*collected by hand auger)				
1	4	2	NA	0 - 2' red orange CLAY and SILT, some sand, trace mica, stiff, dry to moist, no
				plasticity.
4	8	2	NA	0 - 1.4' red orange CLAY and SILT, some sand, trace mica, stiff, dry to moist, no
				plasticity.
			NA	1.4 - 2' CLAY (30%) and fine SAND (50%), some silt (15%), stiff, dry, no plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-12** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 11:40 Drilling Completed 12/30/2008 11:50

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB012(1-2) at 11:45

A31-SB012(5-6) at 11:50

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	4	2.3	NA	0 - 0.8' gravel / roadbed
			NA	0.8 - 1' GRAVEL and orange CLAY.
			NA	1 - 2.3' orange brown CLAY and SILT, little sand, trace mica, stiff, dry to slightly moist,
				no plasticity.
4	8	2.5	NA	0 - 2.5' red orange CLAY and SILT, trace sand and mica flakes, slightly moist, low
				plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-13** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 12:05 Drilling Completed 12/30/2008 12:15

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB013(0-1)* at 9:05

Length and Diameter of Coring Device 4 feet / 1.75 inches

A31-SB013(5-6) at 12:15

*duplicate sample collected

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

Drilling Fluid Used N/A Drilling Method geoprobe

Drilling Contractor ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1*	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, stiff, dry to slightly moist, low
(*collected by hand auger)				to medium plasticity.
1	4	1.5	NA	0 - 1.5' red orange CLAY and SILT, little sand, trace mica, stiff, dry to slightly moist,
				low to medium plasticity.
4	8	2.3	NA	0 - 2.3' red orange CLAY and SILT, little sand, trace mica, little fine gravel (2-4mm,
				angular) from 1.5 -2', stiff, dry to slightly moist, low to medium plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-14** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 8:10 Drilling Completed 12/30/2008 10:00

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB014(0-1) at 8:40

A31-SB014(5-6) at 11:00

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 hand auger

Drilling Contractor ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1	1	NA	0 - 1' red orange CLAY (60%) and SILT (30%), little fine sand (10%), trace mica, dry
				to slightly moist, low to medium plasticity.
1	2	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, stiff, low plasticity.
2	3	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, stiff, low plasticity.
3	4	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, stiff, low plasticity.
4	5	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, stiff, low plasticity.
5	6	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, stiff, low plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-15** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 11:05 Drilling Completed 12/30/2008 11:35

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches

Soil Samples Collected A31-SB015(2-3)* at 11:25
*submitted for MS/MSD
A31-SB015(5-6) at 11:35

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	4	4	NA	0 - 2' gravel associated with roadbed.
			NA	2 - 4' red orange SILT and CLAY, little sand, trace mica, stiff, dry, no plasticity.
4	8	2	NA	0 - 2' red orange SILT and CLAY, little sand, trace mica, stiff, dry, no plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-16** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 12:20 Drilling Completed 12/30/2008 12:30

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB016(0-1) at 9:15

A31-SB016(5-6) at 12:30

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1*	1	NA	0 - 1' red orange CLAY and SILT, trace sand and mica flakes, dry to slightly moist,
(*collected by hand auger)				low plasticity.
1	4	2.5	NA	0 - 2.5' red orange CLAY and SILT, trace sand and mica flakes, dry to slightly moist,
				low plasticity.
4	8	2.8	NA	0 - 2.8' red orange CLAY and SILT, trace sand and mica flakes, some red mottling,
				very stiff, dry to slightly moist, low plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-17** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 10:30 Drilling Completed 12/30/2008 10:45

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB017(0-1) at 8:45

A31-SB017(5-6) at 10:40

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1*	1	NA	0 - 1' red orange CLAY and SILT, little sand, trace mica, dry, low to medium plasticity.
(*collected by hand auger)				
1	4	2	NA	0 - 2' red orange CLAY and SILT, little sand, trace mica, dry, stiff, low to medium
				plasticity. Clay content and plasticity decreasing with depth.
4	8	2	NA	0 - 2' red orange CLAY and SILT, little sand, trace mica, dry, stiff, no plasticity.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-18** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 10:50 Drilling Completed 12/30/2008 11:00

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB018(0-1) at 8:55

A31-SB018(5-6) at 9:50

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1*	1	NA	0 - 1' red orange CLAY and SILT, some sand, trace mica, dry, medium plasticity.
(*collected by hand auger)				
1	4	2	NA	0 - 2' red orange CLAY and SILT, little sand, trace mica flakes, dry, stiff, low to no
				plasticity. Silt content increasing with depth.
4	8	2.5	NA	0 - 2.5' red orange CLAY and SILT, little sand, trace mica flakes, dry, stiff, low to no
				plasticity. Silt and sand content increasing with depth.
				END OF BORING

ARCADIS

Sample/Core Log

Boring/Well **ASB-19** Project/No. Radford Army Ammunition Plant / GP08RAAP.0031.DF000 Page 1 of 1

Site Location Radford, VA

Drilling Started 12/30/2008 9:20 Drilling Completed 12/30/2008 9:35

Total Depth Drilled 8 Feet Hole Diameter 1.75 inches Soil Samples Collected A31-SB019(0-1) at 8:20

A31-SB019(5-6) at 9:35

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 ARCADIS U.S., Inc. Driller Keith Carr Helper --

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

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	PID Reading (ppm)	Sample/Core Description
0	1*	1	NA	0 - 1' red orange CLAY and SILT, little fine to medium sand, trace mica flakes, low
(*collected by hand auger)				to medium plasticity.
1	4	2	NA	0 - 2' red orange CLAY and SILT, little fine to medium sand, trace mica flakes, stiff,
				dry, no plasticity.
4	8	3	NA	0 - 3' red orange CLAY and SILT, little fine to medium sand, trace mica flakes, stiff,
				dry, no plasticity.
				END OF BORING

Appendix B

Data Validation Report

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	

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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
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.

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

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).

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

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.

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

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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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

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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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

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

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

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

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 004

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

RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 007

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 007

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	02/04/09
REVIEW PERFORMED BY:	Rachelle Borne	02/04/09
SIGNATURE:		02/05/09
PEER REVIEW:	Jane Kennedy	02/04/09

The following samples were included in this SDG:

SDG	Sample ID	Sample Date	Parent sample
0812359	A31-IDW	12/30/2008	
0812363	A31-EB001 (123008)	12/30/2008	
0812363	A31-SB003A (0-1)	12/30/2008	
0812363	A31-SB003A (5-6)	12/30/2008	
0812363	A31-SB004A (0-1)	12/30/2008	
0812363	A31-SB004A (5-6)	12/30/2008	
0812363	A31-SB011 (0-1)	12/30/2008	
0812363	A31-SB012 (1-2)	12/30/2008	
0812363	A31-SB012 (5-6)	12/30/2008	
0812363	A31-SB013 (0-1)	12/30/2008	
0812363	A31-SB013 (5-6)	12/30/2008	
0812363	A31-SB014 (0-1)	12/30/2008	
0812363	A31-SB014 (5-6)	12/30/2008	
0812363	A31-SB015 (2-3)	12/30/2008	
0812363	A31-SB015 (5-6)	12/30/2008	
0812363	A31-SB016 (0-1)	12/30/2008	
0812363	A31-SB016 (5-6)	12/30/2008	
0812363	A31-SB017 (0-1)	12/30/2008	
0812363	A31-SB017 (5-6)	12/30/2008	
0812363	A31-SB018 (0-1)	12/30/2008	
0812363	A31-SB018 (5-6)	12/30/2008	
0812363	A31-SB019 (0-1)	12/30/2008	
0812363	A31-SB019 (5-6)	12/30/2008	
0812363	A31-SBDUP002 (0-1)	12/30/2008	A31-SB013 (0-1)

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RADFORD ARMY AMMUNITION PLANT
ELECTRONIC VALIDATION REVIEW REPORT
RADFORD 007

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: (0812363) The temperature of the cooler upon receipt was 0.5 degrees C. No qualification is necessary since none of the samples were frozen.

All soils were reported on a dry weight basis.

(0812359) The laboratory receipt checklist noted that there was only one amber bottle received for sample A31-IDW. There was sufficient sample volume to complete all required analyses.

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		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	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: (0812359 and 0812363) The case narrative noted that 2,4-dinitrotoluene exceeded the ICV with a negative bias. All detections of this compound in the associated field samples are qualified as estimated. See attached qualification summary for details.

(0812363) The case narrative noted that analysis of A31-SB017(0-1) was started 2 minutes beyond the 12 hour tune. No qualification is necessary.

4. (0812363) One surrogate recovery was below the control limit in A31-SB015(5-6). Only one surrogate recovery was outside the control limit. No qualification is necessary.

(0812363) Three or more surrogate recoveries were below the control limit in A31-SB017(0-1), A31-SB018(0-1), A31-SB018(5-6), and A31-SB019(0-1). All SVOC results in these samples are qualified as estimated.

5. (0812363) The recovery of 2,4-dinitrotoluene was below the control limit in the LCS. The associated field samples are qualified as estimated for this compound. See attached qualification summary for details.

6. (0812363) A31-SB015(2-3) was used for the MS/MSD. The recoveries and RPDs were acceptable.

7. (0812363) A31-SBDUP002 (0-1) was collected as a field duplicate of A31-SB013 (0-1). The RPDs were acceptable at non-detect.

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	

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 8082.

4. (0812359) Two surrogate recoveries were below the control limit in A31-IDW. All results are qualified as estimated.

6. (0812359) A31-SB011(0-1) and A31-SB015(2-3) were used for MS/MSDs. The recoveries and RPDs were acceptable.

7. (0812363) A31-SBDUP002 (0-1) was collected as a field duplicate of A31-SB013 (0-1). The RPDs were acceptable at non-detect.

WET CHEMISTRY

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 %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)	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 Method SM5210B for BOD and Method 410.4 for COD.

2. A31-IDW was analyzed at a 6x dilution due to elevated concentrations.

5. The recovery for the BOD was above the control limit in the LCS. A31-IDW is qualified as estimated for BOD.

6. A31-IDW was used as the MS/MSD for COD. The recoveries and RPD were acceptable.

Radford 07
Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Qualifier	Reason	Units	Dilution
0812359	A31-IDW	SM 5210 B	BOD	42.8	J	LCS Recovery	mg/l	6
0812359	A31-IDW	SW8082	PCB-1242	<1.0	UJ	Surrogate Recovery	ug/l	1
0812359	A31-IDW	SW8082	PCB-1260	<1.0	UJ	Surrogate Recovery	ug/l	1
0812359	A31-IDW	SW8082	PCB-1254	<1.0	UJ	Surrogate Recovery	ug/l	1
0812359	A31-IDW	SW8082	PCB-1221	<1.0	UJ	Surrogate Recovery	ug/l	1
0812359	A31-IDW	SW8082	PCB-1232	<1.0	UJ	Surrogate Recovery	ug/l	1
0812359	A31-IDW	SW8082	PCB-1248	<1.0	UJ	Surrogate Recovery	ug/l	1
0812359	A31-IDW	SW8082	PCB-1016	<1.0	UJ	Surrogate Recovery	ug/l	1
0812363	A31-SB003A (0-1)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB003A (5-6)	SW8270	2,4-DINITROTOLUENE	<440.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB004A (0-1)	SW8270	2,4-DINITROTOLUENE	<410.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB004A (5-6)	SW8270	2,4-DINITROTOLUENE	<400.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB012 (1-2)	SW8270	2,4-DINITROTOLUENE	<440.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB012 (5-6)	SW8270	2,4-DINITROTOLUENE	<450.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB013 (0-1)	SW8270	2,4-DINITROTOLUENE	<410.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB013 (5-6)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB014 (0-1)	SW8270	2,4-DINITROTOLUENE	500	J	ICV Recovery and LCS Recovery	ug/kg	1
0812363	A31-SB014 (5-6)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB015 (2-3)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB015 (5-6)	SW8270	2,4-DINITROTOLUENE	<410.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB016 (0-1)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB016 (5-6)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB017 (0-1)	SW8270	2,6-DINITROTOLUENE	<420.0	UJ	Surrogate Recovery	ug/kg	1

Radford 07
Qualification Summary

SDG	Sample ID	Method	Analyte	Result	Qualifier	Reason	Units	Dilution
0812363	A31-SB017 (0-1)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	Surrogate Recovery and LCS Recovery	ug/kg	1
0812363	A31-SB017 (5-6)	SW8270	2,4-DINITROTOLUENE	<410.0	UJ	LCS Recovery	ug/kg	1
0812363	A31-SB018 (0-1)	SW8270	2,6-DINITROTOLUENE	<460.0	UJ	Surrogate Recovery	ug/kg	1
0812363	A31-SB018 (0-1)	SW8270	2,4-DINITROTOLUENE	<460.0	UJ	Surrogate Recovery and LCS Recovery	ug/kg	1
0812363	A31-SB018 (5-6)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	Surrogate Recovery and LCS Recovery	ug/kg	1
0812363	A31-SB018 (5-6)	SW8270	2,6-DINITROTOLUENE	<420.0	UJ	Surrogate Recovery	ug/kg	1
0812363	A31-SB019 (0-1)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	Surrogate Recovery and LCS Recovery	ug/kg	1
0812363	A31-SB019 (0-1)	SW8270	2,6-DINITROTOLUENE	<420.0	UJ	Surrogate Recovery	ug/kg	1
0812363	A31-SB019 (5-6)	SW8270	2,4-DINITROTOLUENE	<420.0	UJ	LCS Recovery	ug/kg	1

Appendix C

Laboratory Reports

ORGANIC CASE NARRATIVE - Semivolatiles
Arcadis – Radford
Workorder: 0807029

Date Sampled	Date Received	Lab ID	Client ID
30-Jun-2008	02-Jul-2008	0807029-01	ASB010 (0-1)
30-Jun-2008	02-Jul-2008	0807029-02	ASB010 (5-6)
30-Jun-2008	02-Jul-2008	0807029-03	ASB009 (0-1)
30-Jun-2008	02-Jul-2008	0807029-04	ASB009 (5-6)
30-Jun-2008	02-Jul-2008	0807029-05	ASB008 (0-1)
30-Jun-2008	02-Jul-2008	0807029-06	ASB008 (5-6)
30-Jun-2008	02-Jul-2008	0807029-07	ASB007 (0-1)
30-Jun-2008	02-Jul-2008	0807029-08	ASB007 (5-6)
30-Jun-2008	02-Jul-2008	0807029-09	ASB005 (0-1)
30-Jun-2008	02-Jul-2008	0807029-10	ASBDUP001 (0-1)
30-Jun-2008	02-Jul-2008	0807029-11	ASB003 (0-1)
30-Jun-2008	02-Jul-2008	0807029-12	EB-2 (063008)
30-Jun-2008	02-Jul-2008	0807029-13	ASB006 (0-1)
30-Jun-2008	02-Jul-2008	0807029-14	ASB006 (5-6)

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:

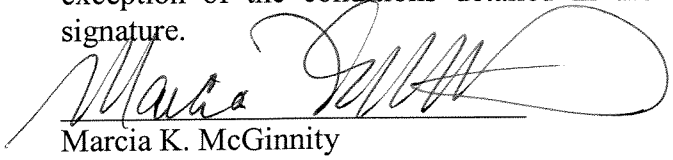
- DFTPP Tuning: All method tuning criteria were met.
- Calibration: Radford criteria were exceeded as indicated in the following clarifications:

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 7/8/08 exceeded 20% difference for atrazine, benzaldehyde, carbazole, 4-chloroaniline, 3,3'-dichlorobenzidine, 3-nitroaniline and 4-nitrophenol with negative biases at 48.7%, 27.8%, 50.4%, 30.2%, 58.6%, 57.9% and 38%, respectively. All results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias. Some analytes exceeded with a positive bias but were not detected above the quantitation limit.
3. BNA3 CCV analyzed 7/9/08 exceeded 20% difference for atrazine, benzaldehyde, carbazole, 4-chloroaniline, 3,3'-dichlorobenzidine, 2,4-dimethylphenol, hexachlorocyclopentadiene, 3-nitroaniline and 4-nitrophenol with negative biases at 55.7%, 22.9%, 53.2%, 30.2%, 43.8%, 20.8%, 45.4&, 56.1% and 36.5%, respectively. All results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias. Some analytes exceeded with a positive bias but were not detected above the quantitation limit. Pyrene exceeded 20% at 20.1% but was not qualified.
4. BNA3 CCV analyzed 7/10/08 1029 exceeded 20% difference for 3,3'-dichlorobenzidine, 4-nitrophenol and pyrene with negative biases at 34.5%, 23.7% and 23%, respectively. All results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias. Some analytes exceeded with a positive bias but were not detected above the quantitation limit.

5. BNA3 CCV analyzed 7/10/08 2317 exceeded 20% difference for 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 2,4-dinitrophenol, hexachlorocyclopentadiene, 4-nitrophenol and pentachlorophenol with negative biases at 29.8%, 54.6%, 53.1%, 52.62%, 44.2% and 48.2%, respectively. All results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias. Some analytes exceeded with a positive bias but were not detected above the quantitation limit.
6. BNA3 CCV analyzed 7/11/08 exceeded 20% difference for atrazine, 3,3'-dichlorobenzidine and 4-nitrophenol with negative biases at 21.8%, 46.9% and 33.4%, respectively. All results for these analytes are qualified with a "Y" on the form Is and EDD for a potential negative bias. Some analytes exceeded with a positive bias but were not detected above the quantitation limit.

- Blank Results: Method blank SBLK00703BW1 reported a concentration of caprolactam less than half the quantitation limit. It was not detected in the associated samples.
- Surrogate Recoveries: All surrogate recoveries were within limits.
- SBLK0703BW1LCS/LCSD: 5 of 130 recoveries exceeded limits with a positive bias while the relative percent difference for 2,4-dimethylphenol exceeded the limit of 30 at 36. Recoveries of caprolactam were below the limit of 20% at 17%/18%. See form 3.
- SBLK0707BS1LCS: Recovery of benzaldehyde was below the limit of 10% at 4% while the recovery of 2,4-dinitrophenol exceeded the limit of 130% at 143%. All other recoveries were within limits.
- SBLK0709BS1LCS/LCSD: The relative percent difference for 2,4-dinitrophenol exceeded the limit of 30 at 32 while benzaldehyde was not recovered. Benzaldehyde recovery issue is associated to degradation of the standard in methanol. A new stock standard is being ordered to address this problem.
- ASB009(0-1)MS/MSD: Recoveries of di-n-butylphthalate exceeded the limit of 130% at 133%/(80%) with a relative percent difference of 49 while benzaldehyde was not recovered. Benzaldehyde recovery issue is associated to degradation of the standard in methanol. A new stock standard is being ordered to address this problem.
- Internal Standard Area Counts: All area counts were within limits.
- Dilutions: All samples were analyzed without dilution. Samples ASB003 (0-1), ASB005 (0-1) and ASBDUP001 (0-1) were analyzed at further dilutions due to target analyte concentrations.

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.

070108-1

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name GP08RAAP.0031.DF000 /RAAP031 (AOCA)

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation SG, MC /ARCADIS

807029

	Sample ID/Location	Matrix	Date Sampled	Time Sampled	Lab ID	SVOCs (8270)	PCBs (8082)	Metals (6010)				Remarks	Total
-01	ASB010 (0-1)	SO	6/30/08	15:50		X	X	X					1
-02	ASB010 (5-6)			15:50		X	X	X					1
-03	ASB009 (0-1)			16:05		X	X	X				⊛MS/MSD	2
-04	ASB009 (5-6)			16:10		X	X	X					2
-05	ASB008 (0-1)			16:25		X	X	X					1
-06	ASB008 (5-6)			16:30		X	X	X					2
-07	ASB007 (0-1)			16:35		X	X	X					1
-08	ASB007 (5-6)			16:40		X	X	X					2
-09	ASB005 (0-1)			17:15		X	X	X					1
-10	ASBDUP001 (0-1)			17:15		X	X	X					1
-11	ASB003 (0-1)			17:30		X	X	X					1
-12	EB-2 (063008)	L	6/30/08	17:45		X	X	Hg SG					4
-13	ASB006-(0-1)										*		
-14	ASB006 (5-6)										*		

Sample Matrix: L = Liquid; S = Solid; A = Air SO = Soil

* Samples ASB006(0-1) & ASB006(5-6) rec'd + not on COC! Added to WO. WS

Total No. of Bottles/Containers: 19

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 7/1/08	Time 16:30	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 7/2/08	Time 09:00			

Special Instructions/Remarks: (1) low volume for samples (2) please contact with any questions

2.8C

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0807029 COC ID(s): 070108-1

Client Arcadis Project Radford

Sample Custodian WS Today's Date 7/2/08

Date/Time Samples Received 7/2/08 09:00

Airbill Number Fedex

Cooler Opened: Date 7/2/08

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): 7/1/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓

Frozen _____

# of Coolers 1 Temp. of Coolers 2.8°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
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB010 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702901

% Moisture: 23 decanted: (Y/N) N Date Sampled: 06/30/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 16:41

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
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	88	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	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		U
105-67-9	2,4-Dimethylphenol	28	1700		UY
131-11-3	Dimethylphthalate	40	430		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB010 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702901

% Moisture: 23 decanted: (Y/N) N Date Sampled: 06/30/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 16:41

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	70	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	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	61	1700		UY
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		UY
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.

ASB010 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702902

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 17:08

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	42	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	48	440		U
101-55-3	4-Bromophenyl-phenylether	34	440		U
85-68-7	Butylbenzylphthalate	39	440		U
105-60-2	Caprolactam	89	440		U
86-74-8	Carbazole	48	440		UY
106-47-8	4-Chloroaniline	63	440		UY
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	45	440		U
105-67-9	2,4-Dimethylphenol	28	1800		UY
131-11-3	Dimethylphthalate	40	440		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB010 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702902

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 17:08

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	61	180		U
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		UY
100-01-6	4-Nitroaniline	130	1800		U
98-95-3	Nitrobenzene	46	440		U
88-75-5	2-Nitrophenol	29	440		U
100-02-7	4-Nitrophenol	110	1800		UY
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.

ASB009 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702903

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 16:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 17:35

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	36	450		U
208-96-8	Acenaphthylene	26	450		U
98-86-2	Acetophenone	55	450		U
1912-24-9	Atrazine	38	450		UY
120-12-7	Anthracene	37	450		U
100-52-7	Benzaldehyde	75	450		UY
56-55-3	Benzo(a)anthracene	49	180		U
205-99-2	Benzo(b)fluoranthene	43	180		U
207-08-9	Benzo(k)fluoranthene	53	450		U
191-24-2	Benzo(g,h,i)perylene	95	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	55	450		U
108-60-1	bis(2-Chloroisopropyl)ether	69	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	91	450		U
86-74-8	Carbazole	49	450		UY
106-47-8	4-Chloroaniline	65	450		UY
59-50-7	4-Chloro-3-methylphenol	38	450		U
91-58-7	2-Chloronaphthalene	43	450		U
95-57-8	2-Chlorophenol	55	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	81	180		U
132-64-9	Dibenzofuran	33	450		U
91-94-1	3,3'-Dichlorobenzidine	42	450		UY
120-83-2	2,4-Dichlorophenol	25	450		U
84-66-2	Diethylphthalate	46	450		U
105-67-9	2,4-Dimethylphenol	29	1800		UY
131-11-3	Dimethylphthalate	41	450		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB009 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702903

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 16:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 17:35

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	41	450	120	J
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	450		U
606-20-2	2,6-Dinitrotoluene	51	450		U
117-84-0	Di-n-octylphthalate	36	450		U
206-44-0	Fluoranthene	72	450		U
86-73-7	Fluorene	35	450		U
118-74-1	Hexachlorobenzene	47	450		U
87-68-3	Hexachlorobutadiene	44	450		U
77-47-4	Hexachlorocyclopentadiene	83	450		UY
67-72-1	Hexachloroethane	53	450		U
193-39-5	Indeno(1,2,3-cd)pyrene	62	180		U
78-59-1	Isophorone	38	450		U
91-57-6	2-Methylnaphthalene	47	450		U
91-20-3	Naphthalene	44	450		U
95-48-7	2-Methylphenol	52	450		U
106-44-5	4-Methylphenol	36	450		U
88-74-4	2-Nitroaniline	43	1800		U
99-09-2	3-Nitroaniline	64	1800		UY
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		UY
86-30-6	N-Nitrosodiphenylamine (1)	43	450		U
621-64-7	N-Nitroso-di-n-propylamine	74	450		U
87-86-5	Pentachlorophenol	46	1800		U
108-95-2	Phenol	49	450		U
129-00-0	Pyrene	54	450		U
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	47	450		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB009 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702904

% Moisture: 23 decanted: (Y/N) N Date Sampled: 06/30/08 16:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 18:03

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		U
101-55-3	4-Bromophenyl-phenylether	34	430		U
85-68-7	Butylbenzylphthalate	39	430		U
105-60-2	Caprolactam	88	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	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		U
105-67-9	2,4-Dimethylphenol	28	1700		UY
131-11-3	Dimethylphthalate	40	430		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB009 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702904

% Moisture: 23 decanted: (Y/N) N Date Sampled: 06/30/08 16:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 18:03

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		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	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		UY
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		UY
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.

ASB008 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702905

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 16:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 18:30

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
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	38	450		UY
120-12-7	Anthracene	37	450		U
100-52-7	Benzaldehyde	75	450		UY
56-55-3	Benzo(a)anthracene	49	180		U
205-99-2	Benzo(b)fluoranthene	43	180		U
207-08-9	Benzo(k)fluoranthene	53	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	55	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		UY
106-47-8	4-Chloroaniline	65	450		UY
59-50-7	4-Chloro-3-methylphenol	38	450		U
91-58-7	2-Chloronaphthalene	43	450		U
95-57-8	2-Chlorophenol	55	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		UY
131-11-3	Dimethylphthalate	41	450		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB008 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702905

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 16:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 18:30

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	51	450		U
117-84-0	Di-n-octylphthalate	36	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	44	450		U
77-47-4	Hexachlorocyclopentadiene	83	450		UY
67-72-1	Hexachloroethane	53	450		U
193-39-5	Indeno(1,2,3-cd)pyrene	63	180		U
78-59-1	Isophorone	38	450		U
91-57-6	2-Methylnaphthalene	47	450		U
91-20-3	Naphthalene	44	450		U
95-48-7	2-Methylphenol	52	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		UY
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		UY
86-30-6	N-Nitrosodiphenylamine (1)	43	450		U
621-64-7	N-Nitroso-di-n-propylamine	74	450		U
87-86-5	Pentachlorophenol	46	1800		U
108-95-2	Phenol	49	450		U
129-00-0	Pyrene	54	450		U
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	47	450		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB008 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702906

% Moisture: 32 decanted: (Y/N) N Date Sampled: 06/30/08 16:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 18:57

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	39	490		U
208-96-8	Acenaphthylene	29	490		U
98-86-2	Acetophenone	60	490		U
1912-24-9	Atrazine	41	490		UY
120-12-7	Anthracene	40	490		U
100-52-7	Benzaldehyde	81	490		UY
56-55-3	Benzo(a)anthracene	53	190		U
205-99-2	Benzo(b)fluoranthene	46	190		U
207-08-9	Benzo(k)fluoranthene	57	490		U
191-24-2	Benzo(g,h,i)perylene	100	490		U
50-32-8	Benzo(a)pyrene	33	190		U
92-52-4	1,1'-Biphenyl	43	490		U
111-91-1	bis(2-Chloroethoxy)methane	45	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	43	490		U
105-60-2	Caprolactam	98	490		U
86-74-8	Carbazole	53	490		UY
106-47-8	4-Chloroaniline	70	490		UY
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	45	490		U
53-70-3	Dibenz(a,h)anthracene	88	190		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		U
105-67-9	2,4-Dimethylphenol	31	1900		UY
131-11-3	Dimethylphthalate	44	490		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB008 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702906

% Moisture: 32 decanted: (Y/N) N Date Sampled: 06/30/08 16:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 18:57

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	44	490		U
534-52-1	4,6-Dinitro-2-methylphenol	32	1900		U
51-28-5	2,4-Dinitrophenol	190	1900		U
121-14-2	2,4-Dinitrotoluene	35	490		U
606-20-2	2,6-Dinitrotoluene	55	490		U
117-84-0	Di-n-octylphthalate	39	490		U
206-44-0	Fluoranthene	78	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	57	490		U
193-39-5	Indeno(1,2,3-cd)pyrene	67	190		U
78-59-1	Isophorone	41	490		U
91-57-6	2-Methylnaphthalene	51	490		U
91-20-3	Naphthalene	47	490		U
95-48-7	2-Methylphenol	56	490		U
106-44-5	4-Methylphenol	39	490		U
88-74-4	2-Nitroaniline	47	1900		U
99-09-2	3-Nitroaniline	69	1900		UY
100-01-6	4-Nitroaniline	150	1900		U
98-95-3	Nitrobenzene	50	490		U
88-75-5	2-Nitrophenol	32	490		U
100-02-7	4-Nitrophenol	120	1900		UY
86-30-6	N-Nitrosodiphenylamine (1)	47	490		U
621-64-7	N-Nitroso-di-n-propylamine	80	490		U
87-86-5	Pentachlorophenol	49	1900		U
108-95-2	Phenol	53	490		U
129-00-0	Pyrene	58	490		U
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.

ASB007 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702907

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 16:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 19:24

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
83-32-9	Acenaphthene	30	380		U
208-96-8	Acenaphthylene	22	380		U
98-86-2	Acetophenone	47	380		U
1912-24-9	Atrazine	32	380		UY
120-12-7	Anthracene	31	380		U
100-52-7	Benzaldehyde	64	380		UY
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	81	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	35	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	41	380	1000	
101-55-3	4-Bromophenyl-phenylether	30	380		U
85-68-7	Butylbenzylphthalate	34	380		U
105-60-2	Caprolactam	77	380		U
86-74-8	Carbazole	41	380		UY
106-47-8	4-Chloroaniline	55	380		UY
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	35	380		U
218-01-9	Chrysene	35	380	41	J
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	24	1500		UY
131-11-3	Dimethylphthalate	35	380		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB007 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702907

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 16:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 19:24

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	2700	
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	310	J
606-20-2	2,6-Dinitrotoluene	43	380		U
117-84-0	Di-n-octylphthalate	31	380		U
206-44-0	Fluoranthene	61	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	70	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	32	380		U
91-57-6	2-Methylnaphthalene	40	380		U
91-20-3	Naphthalene	37	380		U
95-48-7	2-Methylphenol	44	380		U
106-44-5	4-Methylphenol	30	380		U
88-74-4	2-Nitroaniline	37	1500		U
99-09-2	3-Nitroaniline	54	1500		UY
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		UY
86-30-6	N-Nitrosodiphenylamine (1)	37	380	200	J
621-64-7	N-Nitroso-di-n-propylamine	63	380		U
87-86-5	Pentachlorophenol	39	1500		U
108-95-2	Phenol	41	380		U
129-00-0	Pyrene	46	380		U
95-94-3	1,2,4,5-Tetrachlorobenzene	110	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.

ASB007 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702908

% Moisture: 33 decanted: (Y/N) N Date Sampled: 06/30/08 16:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 19:51

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		UY
120-12-7	Anthracene	41	500		U
100-52-7	Benzaldehyde	83	500		UY
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	100	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	44	500		U
105-60-2	Caprolactam	100	500		U
86-74-8	Carbazole	54	500		UY
106-47-8	4-Chloroaniline	72	500		UY
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		UY
131-11-3	Dimethylphthalate	46	500		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB007 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702908

% Moisture: 33 decanted: (Y/N) N Date Sampled: 06/30/08 16:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 19:51

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	42	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		UY
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		UY
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		U
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.

ASB005 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702909

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 20:18

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	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	170		U
205-99-2	Benzo(b)fluoranthene	41	170		U
207-08-9	Benzo(k)fluoranthene	52	440		U
191-24-2	Benzo(g,h,i)perylene	92	440		U
50-32-8	Benzo(a)pyrene	30	170		U
92-52-4	1,1'-Biphenyl	39	440		U
111-91-1	bis(2-Chloroethoxy)methane	40	440		U
111-44-4	bis(2-Chloroethyl)ether	53	440		U
108-60-1	bis(2-Chloroisopropyl)ether	67	440		U
117-81-7	Bis(2-ethylhexyl)phthalate	47	440	900	
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	47	440		UY
106-47-8	4-Chloroaniline	63	440		UY
59-50-7	4-Chloro-3-methylphenol	36	440		U
91-58-7	2-Chloronaphthalene	42	440		U
95-57-8	2-Chlorophenol	53	440		U
7005-72-3	4-Chlorophenyl-phenylether	40	440		U
218-01-9	Chrysene	40	440	42	J
53-70-3	Dibenz(a,h)anthracene	79	170		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	1700		UY
131-11-3	Dimethylphthalate	40	440		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB005 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702909

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 20:18

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	40	440	13000	E
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	32	440	2800	
606-20-2	2,6-Dinitrotoluene	50	440	170	J
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	170		U
78-59-1	Isophorone	37	440		U
91-57-6	2-Methylnaphthalene	46	440		U
91-20-3	Naphthalene	42	440		U
95-48-7	2-Methylphenol	51	440		U
106-44-5	4-Methylphenol	35	440		U
88-74-4	2-Nitroaniline	42	1700		U
99-09-2	3-Nitroaniline	62	1700		UY
100-01-6	4-Nitroaniline	130	1700		U
98-95-3	Nitrobenzene	45	440		U
88-75-5	2-Nitrophenol	29	440		U
100-02-7	4-Nitrophenol	110	1700		U
86-30-6	N-Nitrosodiphenylamine (1)	42	440	930	
621-64-7	N-Nitroso-di-n-propylamine	72	440		U
87-86-5	Pentachlorophenol	44	1700		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.

ASB005 (0-1)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-09DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702909D

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/10/08 23:44

Injection Volume: 0.5(uL) Dilution Factor: 10.0

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	350	4400		UD
208-96-8	Acenaphthylene	260	4400		UD
98-86-2	Acetophenone	540	4400		UD
1912-24-9	Atrazine	370	4400		UD
120-12-7	Anthracene	360	4400		UD
100-52-7	Benzaldehyde	730	4400		UD
56-55-3	Benzo(a)anthracene	480	1700		UD
205-99-2	Benzo(b)fluoranthene	410	1700		UD
207-08-9	Benzo(k)fluoranthene	520	4400		UD
191-24-2	Benzo(g,h,i)perylene	920	4400		UD
50-32-8	Benzo(a)pyrene	300	1700		UD
92-52-4	1,1'-Biphenyl	390	4400		UD
111-91-1	bis(2-Chloroethoxy)methane	400	4400		UD
111-44-4	bis(2-Chloroethyl)ether	530	4400		UD
108-60-1	bis(2-Chloroisopropyl)ether	670	4400		UD
117-81-7	Bis(2-ethylhexyl)phthalate	470	4400	760	JD
101-55-3	4-Bromophenyl-phenylether	340	4400		UD
85-68-7	Butylbenzylphthalate	390	4400		UD
105-60-2	Caprolactam	880	4400		UD
86-74-8	Carbazole	470	4400		UD
106-47-8	4-Chloroaniline	630	4400		UD
59-50-7	4-Chloro-3-methylphenol	360	4400		UD
91-58-7	2-Chloronaphthalene	420	4400		UD
95-57-8	2-Chlorophenol	530	4400		UD
7005-72-3	4-Chlorophenyl-phenylether	400	4400		UD
218-01-9	Chrysene	400	4400		UD
53-70-3	Dibenz(a,h)anthracene	790	1700		UD
132-64-9	Dibenzofuran	320	4400		UD
91-94-1	3,3'-Dichlorobenzidine	410	4400		UDY
120-83-2	2,4-Dichlorophenol	250	4400		UD
84-66-2	Diethylphthalate	440	4400		UD
105-67-9	2,4-Dimethylphenol	280	17000		UD
131-11-3	Dimethylphthalate	400	4400		UD

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB005 (0-1)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-09DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702909D

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/10/08 23:44

Injection Volume: 0.5(uL) Dilution Factor: 10.0

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	400	4400	15000	D
534-52-1	4,6-Dinitro-2-methylphenol	280	17000		UDY
51-28-5	2,4-Dinitrophenol	1700	17000		UDY
121-14-2	2,4-Dinitrotoluene	320	4400	1400	JD
606-20-2	2,6-Dinitrotoluene	500	4400		UD
117-84-0	Di-n-octylphthalate	350	4400		UD
206-44-0	Fluoranthene	700	4400		UD
86-73-7	Fluorene	340	4400		UD
118-74-1	Hexachlorobenzene	460	4400		UD
87-68-3	Hexachlorobutadiene	430	4400		UD
77-47-4	Hexachlorocyclopentadiene	800	4400		UD
67-72-1	Hexachloroethane	520	4400		UD
193-39-5	Indeno(1,2,3-cd)pyrene	600	1700		UD
78-59-1	Isophorone	370	4400		UD
91-57-6	2-Methylnaphthalene	460	4400		UD
91-20-3	Naphthalene	420	4400		UD
95-48-7	2-Methylphenol	510	4400		UD
106-44-5	4-Methylphenol	350	4400		UD
88-74-4	2-Nitroaniline	420	17000		UD
99-09-2	3-Nitroaniline	620	17000		UD
100-01-6	4-Nitroaniline	1300	17000		UD
98-95-3	Nitrobenzene	450	4400		UD
88-75-5	2-Nitrophenol	290	4400		UD
100-02-7	4-Nitrophenol	1100	17000		UD
86-30-6	N-Nitrosodiphenylamine (1)	420	4400	900	JD
621-64-7	N-Nitroso-di-n-propylamine	720	4400		UD
87-86-5	Pentachlorophenol	440	17000		UD
108-95-2	Phenol	470	4400		UD
129-00-0	Pyrene	520	4400		UD
95-94-3	1,2,4,5-Tetrachlorobenzene	1300	4400		UD
95-95-4	2,4,5-Trichlorophenol	350	4400		UD
88-06-2	2,4,6-Trichlorophenol	460	4400		UD

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASBDUP001 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702910

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 20:45

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	26	450	57	J
98-86-2	Acetophenone	55	450		U
1912-24-9	Atrazine	38	450		U
120-12-7	Anthracene	37	450	64	J
100-52-7	Benzaldehyde	75	450		U
56-55-3	Benzo(a)anthracene	49	180	450	
205-99-2	Benzo(b)fluoranthene	43	180	480	
207-08-9	Benzo(k)fluoranthene	53	450	380	J
191-24-2	Benzo(g,h,i)perylene	95	450	280	J
50-32-8	Benzo(a)pyrene	31	180	380	
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	55	450		U
108-60-1	bis(2-Chloroisopropyl)ether	69	450		U
117-81-7	Bis(2-ethylhexyl)phthalate	49	450	2500	
101-55-3	4-Bromophenyl-phenylether	35	450		U
85-68-7	Butylbenzylphthalate	40	450		U
105-60-2	Caprolactam	91	450		U
86-74-8	Carbazole	49	450	77	J
106-47-8	4-Chloroaniline	65	450		U
59-50-7	4-Chloro-3-methylphenol	38	450		U
91-58-7	2-Chloronaphthalene	43	450		U
95-57-8	2-Chlorophenol	55	450		U
7005-72-3	4-Chlorophenyl-phenylether	42	450		U
218-01-9	Chrysene	42	450	660	
53-70-3	Dibenz(a,h)anthracene	81	180	290	
132-64-9	Dibenzofuran	33	450		U
91-94-1	3,3'-Dichlorobenzidine	42	450		U
120-83-2	2,4-Dichlorophenol	25	450		U
84-66-2	Diethylphthalate	46	450		U
105-67-9	2,4-Dimethylphenol	29	1800		U
131-11-3	Dimethylphthalate	41	450		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASBDUP001 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702910

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 20:45

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	27000	E
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	450	7300	
606-20-2	2,6-Dinitrotoluene	51	450	430	J
117-84-0	Di-n-octylphthalate	36	450		U
206-44-0	Fluoranthene	72	450	1300	
86-73-7	Fluorene	35	450		U
118-74-1	Hexachlorobenzene	47	450		U
87-68-3	Hexachlorobutadiene	44	450		U
77-47-4	Hexachlorocyclopentadiene	83	450		U
67-72-1	Hexachloroethane	53	450		U
193-39-5	Indeno(1,2,3-cd)pyrene	62	180	390	
78-59-1	Isophorone	38	450		U
91-57-6	2-Methylnaphthalene	47	450		U
91-20-3	Naphthalene	44	450		U
95-48-7	2-Methylphenol	52	450		U
106-44-5	4-Methylphenol	36	450		U
88-74-4	2-Nitroaniline	43	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)	43	450	1400	
621-64-7	N-Nitroso-di-n-propylamine	74	450		U
87-86-5	Pentachlorophenol	46	1800		U
108-95-2	Phenol	49	450		U
129-00-0	Pyrene	54	450	810	X
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	47	450		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
ASBDUP00
1 (0-1)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-10DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702910D

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/11/08 00:11

Injection Volume: 0.5(uL) Dilution Factor: 50.0

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	1800	22000		UD
208-96-8	Acenaphthylene	1300	22000		UD
98-86-2	Acetophenone	2800	22000		UD
1912-24-9	Atrazine	1900	22000		UD
120-12-7	Anthracene	1800	22000		UD
100-52-7	Benzaldehyde	3700	22000		UD
56-55-3	Benzo(a)anthracene	2400	9000		UD
205-99-2	Benzo(b)fluoranthene	2100	9000		UD
207-08-9	Benzo(k)fluoranthene	2600	22000		UD
191-24-2	Benzo(g,h,i)perylene	4800	22000		UD
50-32-8	Benzo(a)pyrene	1500	9000		UD
92-52-4	1,1'-Biphenyl	2000	22000		UD
111-91-1	bis(2-Chloroethoxy)methane	2100	22000		UD
111-44-4	bis(2-Chloroethyl)ether	2800	22000		UD
108-60-1	bis(2-Chloroisopropyl)ether	3500	22000		UD
117-81-7	Bis(2-ethylhexyl)phthalate	2400	22000		UD
101-55-3	4-Bromophenyl-phenylether	1700	22000		UD
85-68-7	Butylbenzylphthalate	2000	22000		UD
105-60-2	Caprolactam	4600	22000		UD
86-74-8	Carbazole	2400	22000		UD
106-47-8	4-Chloroaniline	3200	22000		UD
59-50-7	4-Chloro-3-methylphenol	1900	22000		UD
91-58-7	2-Chloronaphthalene	2200	22000		UD
95-57-8	2-Chlorophenol	2800	22000		UD
7005-72-3	4-Chlorophenyl-phenylether	2100	22000		UD
218-01-9	Chrysene	2100	22000		UD
53-70-3	Dibenz(a,h)anthracene	4100	9000		UD
132-64-9	Dibenzofuran	1600	22000		UD
91-94-1	3,3'-Dichlorobenzidine	2100	22000		UDY
120-83-2	2,4-Dichlorophenol	1300	22000		UD
84-66-2	Diethylphthalate	2300	22000		UD
105-67-9	2,4-Dimethylphenol	1400	90000		UD
131-11-3	Dimethylphthalate	2100	22000		UD

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASBDUP00
1 (0-1)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-10DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702910D

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/11/08 00:11

Injection Volume: 0.5(uL) Dilution Factor: 50.0

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	2000	22000	68000	D
534-52-1	4,6-Dinitro-2-methylphenol	1500	90000		UDY
51-28-5	2,4-Dinitrophenol	9000	90000		UDY
121-14-2	2,4-Dinitrotoluene	1600	22000	3800	JD
606-20-2	2,6-Dinitrotoluene	2600	22000		UD
117-84-0	Di-n-octylphthalate	1800	22000		UD
206-44-0	Fluoranthene	3600	22000		UD
86-73-7	Fluorene	1800	22000		UD
118-74-1	Hexachlorobenzene	2300	22000		UD
87-68-3	Hexachlorobutadiene	2200	22000		UD
77-47-4	Hexachlorocyclopentadiene	4100	22000		UD
67-72-1	Hexachloroethane	2600	22000		UD
193-39-5	Indeno(1,2,3-cd)pyrene	3100	9000		UD
78-59-1	Isophorone	1900	22000		UD
91-57-6	2-Methylnaphthalene	2400	22000		UD
91-20-3	Naphthalene	2200	22000		UD
95-48-7	2-Methylphenol	2600	22000		UD
106-44-5	4-Methylphenol	1800	22000		UD
88-74-4	2-Nitroaniline	2200	90000		UD
99-09-2	3-Nitroaniline	3200	90000		UD
100-01-6	4-Nitroaniline	6800	90000		UD
98-95-3	Nitrobenzene	2300	22000		UD
88-75-5	2-Nitrophenol	1500	22000		UD
100-02-7	4-Nitrophenol	5500	90000		UD
86-30-6	N-Nitrosodiphenylamine (1)	2200	22000		UD
621-64-7	N-Nitroso-di-n-propylamine	3700	22000		UD
87-86-5	Pentachlorophenol	2300	90000		UD
108-95-2	Phenol	2400	22000		UD
129-00-0	Pyrene	2700	22000		UD
95-94-3	1,2,4,5-Tetrachlorobenzene	6800	22000		UD
95-95-4	2,4,5-Trichlorophenol	1800	22000		UD
88-06-2	2,4,6-Trichlorophenol	2400	22000		UD

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB003 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702911

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 17:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 21:12

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	22	380		U
98-86-2	Acetophenone	47	380		U
1912-24-9	Atrazine	32	380		UY
120-12-7	Anthracene	31	380		U
100-52-7	Benzaldehyde	63	380		UY
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	81	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	35	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	41	380	3400	
101-55-3	4-Bromophenyl-phenylether	30	380		U
85-68-7	Butylbenzylphthalate	34	380		U
105-60-2	Caprolactam	77	380		U
86-74-8	Carbazole	41	380		UY
106-47-8	4-Chloroaniline	55	380		UY
59-50-7	4-Chloro-3-methylphenol	32	380		U
91-58-7	2-Chloronaphthalene	36	380		U
95-57-8	2-Chlorophenol	47	380		U
7005-72-3	4-Chlorophenyl-phenylether	35	380		U
218-01-9	Chrysene	35	380	57	J
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	160	J
105-67-9	2,4-Dimethylphenol	24	1500		UY
131-11-3	Dimethylphthalate	35	380		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB003 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702911

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 17:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 21:12

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	69000	E
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	100000	E
606-20-2	2,6-Dinitrotoluene	43	380	7700	E
117-84-0	Di-n-octylphthalate	31	380		U
206-44-0	Fluoranthene	61	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	70	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	32	380		U
91-57-6	2-Methylnaphthalene	40	380		U
91-20-3	Naphthalene	37	380		U
95-48-7	2-Methylphenol	44	380		U
106-44-5	4-Methylphenol	30	380		U
88-74-4	2-Nitroaniline	37	1500		U
99-09-2	3-Nitroaniline	54	1500		UY
100-01-6	4-Nitroaniline	110	1500		U
98-95-3	Nitrobenzene	40	380		U
88-75-5	2-Nitrophenol	25	380		U
100-02-7	4-Nitrophenol	93	1500		UY
86-30-6	N-Nitrosodiphenylamine (1)	36	380	18000	E
621-64-7	N-Nitroso-di-n-propylamine	63	380		U
87-86-5	Pentachlorophenol	39	1500		U
108-95-2	Phenol	41	380		U
129-00-0	Pyrene	46	380		U
95-94-3	1,2,4,5-Tetrachlorobenzene	110	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.

ASB003 (0-1)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-11DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702911D

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 17:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/11/08 10:48

Injection Volume: 0.5(uL) Dilution Factor: 100.0

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	3000	38000		UD
208-96-8	Acenaphthylene	2200	38000		UD
98-86-2	Acetophenone	4700	38000		UD
1912-24-9	Atrazine	3200	38000		UDY
120-12-7	Anthracene	3100	38000		UD
100-52-7	Benzaldehyde	6300	38000		UD
56-55-3	Benzo(a)anthracene	4200	15000		UD
205-99-2	Benzo(b)fluoranthene	3600	15000		UD
207-08-9	Benzo(k)fluoranthene	4500	38000		UD
191-24-2	Benzo(g,h,i)perylene	8100	38000		UD
50-32-8	Benzo(a)pyrene	2600	15000		UD
92-52-4	1,1'-Biphenyl	3400	38000		UD
111-91-1	bis(2-Chloroethoxy)methane	3500	38000		UD
111-44-4	bis(2-Chloroethyl)ether	4700	38000		UD
108-60-1	bis(2-Chloroisopropyl)ether	5900	38000		UD
117-81-7	Bis(2-ethylhexyl)phthalate	4100	38000		UD
101-55-3	4-Bromophenyl-phenylether	3000	38000		UD
85-68-7	Butylbenzylphthalate	3400	38000		UD
105-60-2	Caprolactam	7700	38000		UD
86-74-8	Carbazole	4100	38000		UD
106-47-8	4-Chloroaniline	5500	38000		UD
59-50-7	4-Chloro-3-methylphenol	3200	38000		UD
91-58-7	2-Chloronaphthalene	3600	38000		UD
95-57-8	2-Chlorophenol	4700	38000		UD
7005-72-3	4-Chlorophenyl-phenylether	3500	38000		UD
218-01-9	Chrysene	3500	38000		UD
53-70-3	Dibenz(a,h)anthracene	6900	15000		UD
132-64-9	Dibenzofuran	2800	38000		UD
91-94-1	3,3'-Dichlorobenzidine	3600	38000		UDY
120-83-2	2,4-Dichlorophenol	2200	38000		UD
84-66-2	Diethylphthalate	3900	38000		UD
105-67-9	2,4-Dimethylphenol	2400	150000		UD
131-11-3	Dimethylphthalate	3500	38000		UD

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB003 (0-1)DL

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-11DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702911D

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 17:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/11/08 10:48

Injection Volume: 0.5(uL) Dilution Factor: 100.0

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	3500	38000	410000	D
534-52-1	4,6-Dinitro-2-methylphenol	2500	150000		UD
51-28-5	2,4-Dinitrophenol	15000	150000		UD
121-14-2	2,4-Dinitrotoluene	2800	38000	98000	D
606-20-2	2,6-Dinitrotoluene	4300	38000	4600	JD
117-84-0	Di-n-octylphthalate	3100	38000		UD
206-44-0	Fluoranthene	6100	38000		UD
86-73-7	Fluorene	3000	38000		UD
118-74-1	Hexachlorobenzene	4000	38000		UD
87-68-3	Hexachlorobutadiene	3800	38000		UD
77-47-4	Hexachlorocyclopentadiene	7000	38000		UD
67-72-1	Hexachloroethane	4500	38000		UD
193-39-5	Indeno(1,2,3-cd)pyrene	5300	15000		UD
78-59-1	Isophorone	3200	38000		UD
91-57-6	2-Methylnaphthalene	4000	38000		UD
91-20-3	Naphthalene	3700	38000		UD
95-48-7	2-Methylphenol	4400	38000		UD
106-44-5	4-Methylphenol	3000	38000		UD
88-74-4	2-Nitroaniline	3700	150000		UD
99-09-2	3-Nitroaniline	5400	150000		UD
100-01-6	4-Nitroaniline	11000	150000		UD
98-95-3	Nitrobenzene	4000	38000		UD
88-75-5	2-Nitrophenol	2500	38000		UD
100-02-7	4-Nitrophenol	9300	150000		UDY
86-30-6	N-Nitrosodiphenylamine (1)	3600	38000	22000	JD
621-64-7	N-Nitroso-di-n-propylamine	6300	38000		UD
87-86-5	Pentachlorophenol	3900	150000		UD
108-95-2	Phenol	4100	38000		UD
129-00-0	Pyrene	4600	38000		UD
95-94-3	1,2,4,5-Tetrachlorobenzene	11000	38000		UD
95-95-4	2,4,5-Trichlorophenol	3100	38000		UD
88-06-2	2,4,6-Trichlorophenol	4000	38000		UD

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB-2 (063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) WATER Lab Sample ID: 0807029-12

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 0702912

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 06/30/08 17:45

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/03/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/08/08 08:38

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	0.58	4.6		U
208-96-8	Acenaphthylene	0.44	4.6		U
98-86-2	Acetophenone	0.69	4.6		U
1912-24-9	Atrazine	0.64	4.6		UY
120-12-7	Anthracene	0.71	4.6		U
100-52-7	Benzaldehyde	0.53	4.6	0.61	JY
56-55-3	Benzo(a)anthracene	0.84	4.6		U
205-99-2	Benzo(b)fluoranthene	0.66	4.6		U
207-08-9	Benzo(k)fluoranthene	0.46	4.6		U
191-24-2	Benzo(g,h,i)perylene	1.4	4.6		U
50-32-8	Benzo(a)pyrene	0.56	1.8		U
92-52-4	1,1'-Biphenyl	0.36	4.6		U
111-91-1	bis(2-Chloroethoxy)methane	0.48	4.6		U
111-44-4	bis(2-Chloroethyl)ether	0.42	4.6		U
108-60-1	bis(2-Chloroisopropyl)ether	0.79	4.6		U
117-81-7	Bis(2-ethylhexyl)phthalate	1.2	4.6		U
101-55-3	4-Bromophenyl-phenylether	0.53	4.6		U
85-68-7	Butylbenzylphthalate	0.76	4.6		U
105-60-2	Caprolactam	0.33	4.6	0.63	JB
86-74-8	Carbazole	0.64	4.6		UY
106-47-8	4-Chloroaniline	0.88	4.6		UY
59-50-7	4-Chloro-3-methylphenol	0.54	4.6		U
91-58-7	2-Chloronaphthalene	0.54	4.6		U
95-57-8	2-Chlorophenol	0.55	4.6		U
7005-72-3	4-Chlorophenyl-phenylether	0.82	4.6		U
218-01-9	Chrysene	0.94	4.6		U
53-70-3	Dibenz(a,h)anthracene	1.6	4.6		U
132-64-9	Dibenzofuran	0.60	4.6		U
91-94-1	3,3'-Dichlorobenzidine	0.82	4.6		UY
120-83-2	2,4-Dichlorophenol	0.41	4.6		U
84-66-2	Diethylphthalate	0.94	4.6		U
105-67-9	2,4-Dimethylphenol	0.66	18		U
131-11-3	Dimethylphthalate	0.68	4.6		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EB-2 (063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) WATER Lab Sample ID: 0807029-12

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 0702912

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 06/30/08 17:45

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/03/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/08/08 08:38

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
84-74-2	Di-n-butylphthalate	1.2	4.6		U
534-52-1	4,6-Dinitro-2-methylphenol	0.68	18		U
51-28-5	2,4-Dinitrophenol	0.79	46		U
121-14-2	2,4-Dinitrotoluene	0.45	4.6		U
606-20-2	2,6-Dinitrotoluene	0.61	4.6		U
117-84-0	Di-n-octylphthalate	0.30	4.6		U
206-44-0	Fluoranthene	0.65	4.6		U
86-73-7	Fluorene	0.51	4.6		U
118-74-1	Hexachlorobenzene	0.44	4.6		U
87-68-3	Hexachlorobutadiene	0.86	4.6		U
77-47-4	Hexachlorocyclopentadiene	0.82	4.6		U
67-72-1	Hexachloroethane	0.42	4.6		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.3	4.6		U
78-59-1	Isophorone	0.51	4.6		U
91-57-6	2-Methylnaphthalene	0.63	4.6		U
91-20-3	Naphthalene	0.42	4.6		U
95-48-7	2-Methylphenol	0.77	4.6		U
106-44-5	4-Methylphenol	0.71	4.6		U
88-74-4	2-Nitroaniline	1.1	18		U
99-09-2	3-Nitroaniline	0.97	18		UY
100-01-6	4-Nitroaniline	1.9	18		U
98-95-3	Nitrobenzene	0.57	4.6		U
88-75-5	2-Nitrophenol	0.68	4.6		U
100-02-7	4-Nitrophenol	0.77	18		UY
86-30-6	N-Nitrosodiphenylamine (1)	0.42	4.6		U
621-64-7	N-Nitroso-di-n-propylamine	0.83	4.6		U
87-86-5	Pentachlorophenol	0.92	18		U
108-95-2	Phenol	0.42	4.6		U
129-00-0	Pyrene	0.60	4.6		U
95-94-3	1,2,4,5-Tetrachlorobenzene	0.92	4.6		U
95-95-4	2,4,5-Trichlorophenol	0.46	4.6		U
88-06-2	2,4,6-Trichlorophenol	0.68	4.6		U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB006 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-13

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702913RE

% Moisture: 19 decanted: (Y/N) N Date Sampled: 06/30/08 17:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/09/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/11/08 10:20

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		UY
120-12-7	Anthracene	33	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		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.

ASB006 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-13

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702913RE

% Moisture: 19 decanted: (Y/N) N Date Sampled: 06/30/08 17:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/09/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/11/08 10:20

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	60	J
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	46	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		U
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	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		U
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	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.

ASB006 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-14

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702914

% Moisture: 17 decanted: (Y/N) N Date Sampled: 06/30/08 17:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 22:06

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
83-32-9	Acenaphthene	32	400		U
208-96-8	Acenaphthylene	24	400		U
98-86-2	Acetophenone	49	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	47	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	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	62	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	81	400		U
86-74-8	Carbazole	44	400		UY
106-47-8	4-Chloroaniline	58	400		UY
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		U
53-70-3	Dibenz(a,h)anthracene	72	160		U
132-64-9	Dibenzofuran	29	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		UY
131-11-3	Dimethylphthalate	37	400		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB006 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-14

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0702914

% Moisture: 17 decanted: (Y/N) N Date Sampled: 06/30/08 17:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 22:06

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	36	400		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	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	64	400		U
86-73-7	Fluorene	31	400		U
118-74-1	Hexachlorobenzene	42	400		U
87-68-3	Hexachlorobutadiene	39	400		U
77-47-4	Hexachlorocyclopentadiene	74	400		UY
67-72-1	Hexachloroethane	47	400		U
193-39-5	Indeno(1,2,3-cd)pyrene	55	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	46	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		UY
100-01-6	4-Nitroaniline	120	1600		U
98-95-3	Nitrobenzene	42	400		U
88-75-5	2-Nitrophenol	26	400		U
100-02-7	4-Nitrophenol	97	1600		UY
86-30-6	N-Nitrosodiphenylamine (1)	38	400		U
621-64-7	N-Nitroso-di-n-propylamine	66	400		U
87-86-5	Pentachlorophenol	41	1600		U
108-95-2	Phenol	43	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 2
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Level:(low/med) LOW

	CLIENT SAMPLE NO.	S1 (2FP)#	S2 (PHL)#	S3 (NBZ)#	S4 (FBP)#	S5 (TBP)#	S6 (TPH)#	S7 #	S8 #	TOT OUT
01	SBLK0707BS1	52	56	48	58	55	60			0
02	SBLK0707BS1L	79	84	71	80	80	68			0
03	ASB010 (0-1)	57	62	53	64	62	56			0
04	ASB010 (5-6)	62	66	58	67	68	58			0
05	ASB009 (0-1)	68	74	63	75	74	63			0
06	ASB009 (5-6)	61	66	56	65	68	57			0
07	ASB008 (0-1)	70	76	65	78	72	63			0
08	ASB008 (5-6)	60	64	56	65	61	54			0
09	ASB007 (0-1)	47	52	44	53	52	46			0
10	ASB007 (5-6)	43	48	41	50	54	49			0
11	ASB005 (0-1)	54	59	50	60	57	53			0
12	ASBDUP001 (0	63	69	59	72	74	67			0
13	ASB003 (0-1)	46	54	49	59	52	52			0
14	ASB006 (5-6)	56	61	52	61	63	59			0
15	ASB009 (0-1)	71	76	64	73	76	65			0
16	ASB009 (0-1)	61	67	55	64	70	57			0
17	SBLK0709BS1L	72	77	66	76	74	71			0
18	SBLK0709BS1L	63	67	58	70	66	74			0
19	SBLK0709BS1	58	63	55	65	59	75			0
20	ASB005 (0-1)	50D	52D	44D	63D	69D	56D			0
21	ASBDUP001 (0	0D	0D	0D	0D	0D	0D			0
22	ASB006 (0-1)	58	64	54	68	65	67			0
23	ASB003 (0-1)	0D	0D	0D	0D	0D	0D			0
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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

	CLIENT SAMPLE NO.	S1 (2FP)#	S2 (PHL)#	S3 (NBZ)#	S4 (FBP)#	S5 (TBP)#	S6 (TPH)#	S7 #	S8 #	TOT OUT
01	SBLK0703BW1L	42	28	74	74	95	79			0
02	SBLK0703BW1L	45	29	77	75	93	84			0
03	SBLK0703BW1	40	25	70	63	89	75			0
04	EB-2 (063008	34	20	65	67	82	73			0
05										
06										
07										
08										
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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
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0703BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
Acenaphthene	50.00	0.0000	49.84	100	45-110
Acenaphthylene	50.00	0.0000	46.91	94	50-105
Acetophenone	50.00	0.0000	34.96	70	50-110
Atrazine	50.00	0.0000	38.12	76	70-115
Anthracene	50.00	0.0000	48.58	97	55-110
Benzaldehyde	50.00	0.0000	37.05	74	10-180
Benzo(a)anthracene	50.00	0.0000	44.71	89	55-110
Benzo(b)fluoranthene	50.00	0.0000	49.84	100	45-120
Benzo(k)fluoranthene	50.00	0.0000	42.45	85	45-125
Benzo(g,h,i)perylene	50.00	0.0000	51.99	104	40-125
Benzo(a)pyrene	50.00	0.0000	48.28	96	55-110
1,1'-Biphenyl	50.00	0.0000	42.82	86	50-110
bis(2-Chloroethoxy)meth	50.00	0.0000	40.58	81	45-105
bis(2-Chloroethyl)ether	50.00	0.0000	40.86	82	35-110
bis(2-Chloroisopropyl)e	50.00	0.0000	37.79	76	25-130
Bis(2-ethylhexyl)phthal	50.00	0.0000	44.33	89	40-125
4-Bromophenyl-phenyleth	50.00	0.0000	38.14	76	50-115
Butylbenzylphthalate	50.00	0.0000	45.97	92	45-115
Caprolactam	50.00	0.8045	9.399	17*	20-110
Carbazole	50.00	0.0000	43.88	88	50-115
4-Chloroaniline	50.00	0.0000	25.29	50	15-110
4-Chloro-3-methylphenol	50.00	0.0000	45.53	91	45-110
2-Chloronaphthalene	50.00	0.0000	41.93	84	50-105
2-Chlorophenol	50.00	0.0000	38.61	77	35-105
4-Chlorophenyl-phenylet	50.00	0.0000	44.85	90	50-110
Chrysene	50.00	0.0000	47.26	94	55-110
Dibenz(a,h)anthracene	50.00	0.0000	44.69	89	40-125
Dibenzofuran	50.00	0.0000	44.76	90	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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0703BW1

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	21.01	42	20-110
2,4-Dichlorophenol	50.00	0.0000	41.72	83	50-105
Diethylphthalate	50.00	0.0000	52.42	105	40-120
2,4-Dimethylphenol	50.00	0.0000	40.98	82	30-110
Dimethylphthalate	50.00	0.0000	45.40	91	25-125
Di-n-butylphthalate	50.00	0.0000	50.99	102	55-115
4,6-Dinitro-2-methylphe	50.00	0.0000	71.00	142*	40-130
2,4-Dinitrophenol	50.00	0.0000	88.22	176*	15-140
2,4-Dinitrotoluene	50.00	0.0000	50.49	101	50-120
2,6-Dinitrotoluene	50.00	0.0000	46.62	93	50-115
Di-n-octylphthalate	50.00	0.0000	43.88	88	35-135
Fluoranthene	50.00	0.0000	49.96	100	55-115
Fluorene	50.00	0.0000	46.12	92	50-110
Hexachlorobenzene	50.00	0.0000	49.68	99	50-110
Hexachlorobutadiene	50.00	0.0000	31.82	64	25-105
Hexachlorocyclopentadie	50.00	0.0000	30.11	60	10-110
Hexachloroethane	50.00	0.0000	30.04	60	30- 95
Indeno(1,2,3-cd)pyrene	50.00	0.0000	45.85	92	45-125
Isophorone	50.00	0.0000	42.37	85	50-110
2-Methylnaphthalene	50.00	0.0000	43.73	87	45-105
Naphthalene	50.00	0.0000	39.22	78	40-100
2-Methylphenol	50.00	0.0000	33.68	67	40-110
4-Methylphenol	50.00	0.0000	30.82	62	30-110
2-Nitroaniline	50.00	0.0000	41.17	82	50-115
3-Nitroaniline	50.00	0.0000	33.29	66	20-125
4-Nitroaniline	50.00	0.0000	44.49	89	35-120
Nitrobenzene	50.00	0.0000	36.37	73	45-110
2-Nitrophenol	50.00	0.0000	47.01	94	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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0703BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
4-Nitrophenol	50.00	0.0000	13.61	27	0-125
N-Nitrosodiphenylamine	50.00	0.0000	42.27	84	50-110
N-Nitroso-di-n-prop.(1)	50.00	0.0000	41.68	83	35-130
Pentachlorophenol	50.00	0.0000	58.24	116*	40-115
Phenol	50.00	0.0000	15.48	31	0-115
Pyrene	50.00	0.0000	42.48	85	50-130
1,2,4,5-Tetrachlorobenz	50.00	0.0000	47.38	95	50-125
2,4,5-Trichlorophenol	50.00	0.0000	44.60	89	50-110
2,4,6-Trichlorophenol	50.00	0.0000	44.12	88	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

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0703BW1

COMPOUND	SPIKE ADDED (UG/L)	LCSD CONCENTRATION (UG/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acenaphthene	50.00	50.91	102	2	30	45-110
Acenaphthylene	50.00	48.20	96	3	30	50-105
Acetophenone	50.00	38.11	76	9	30	50-110
Atrazine	50.00	39.31	79	3	30	70-115
Anthracene	50.00	48.76	98	0	30	55-110
Benzaldehyde	50.00	40.00	80	8	30	10-180
Benzo(a)anthracene	50.00	44.73	89	0	30	55-110
Benzo(b)fluoranthene	50.00	50.23	100	1	30	45-120
Benzo(k)fluoranthene	50.00	44.10	88	4	30	45-125
Benzo(g,h,i)perylene	50.00	49.82	100	4	30	40-125
Benzo(a)pyrene	50.00	48.44	97	0	30	55-110
1,1'-Biphenyl	50.00	44.73	89	4	30	50-110
bis(2-Chloroethoxy)meth	50.00	42.11	84	4	30	45-105
bis(2-Chloroethyl)ether	50.00	43.22	86	6	30	35-110
bis(2-Chloroisopropyl)e	50.00	40.76	82	8	30	25-130
Bis(2-ethylhexyl)phthal	50.00	44.09	88	0	30	40-125
4-Bromophenyl-phenyleth	50.00	39.68	79	4	30	50-115
Butylbenzylphthalate	50.00	45.92	92	0	30	45-115
Caprolactam	50.00	9.683	18*	3	30	20-110
Carbazole	50.00	48.98	98	11	30	50-115
4-Chloroaniline	50.00	26.03	52	3	30	15-110
4-Chloro-3-methylphenol	50.00	45.02	90	1	30	45-110
2-Chloronaphthalene	50.00	43.34	87	3	30	50-105
2-Chlorophenol	50.00	41.40	83	7	30	35-105
4-Chlorophenyl-phenylet	50.00	46.30	93	3	30	50-110
Chrysene	50.00	47.84	96	1	30	55-110
Dibenz(a,h)anthracene	50.00	44.97	90	1	30	40-125
Dibenzofuran	50.00	46.42	93	4	30	55-105

(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
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0703BW1

COMPOUND	SPIKE ADDED (UG/L)	LCSD CONCENTRATION (UG/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
3,3'-Dichlorobenzidine	50.00	17.15	34	20	30	20-110
2,4-Dichlorophenol	50.00	42.97	86	3	30	50-105
Diethylphthalate	50.00	52.20	104	0	30	40-120
2,4-Dimethylphenol	50.00	28.32	57	36*	30	30-110
Dimethylphthalate	50.00	46.12	92	2	30	25-125
Di-n-butylphthalate	50.00	50.62	101	1	30	55-115
4,6-Dinitro-2-methylphe	50.00	72.35	145*	2	30	40-130
2,4-Dinitrophenol	50.00	88.82	178*	1	30	15-140
2,4-Dinitrotoluene	50.00	51.92	104	3	30	50-120
2,6-Dinitrotoluene	50.00	47.12	94	1	30	50-115
Di-n-octylphthalate	50.00	44.44	89	1	30	35-135
Fluoranthene	50.00	49.93	100	0	30	55-115
Fluorene	50.00	46.98	94	2	30	50-110
Hexachlorobenzene	50.00	51.54	103	4	30	50-110
Hexachlorobutadiene	50.00	33.99	68	6	30	25-105
Hexachlorocyclopentadie	50.00	31.16	62	3	30	10-110
Hexachloroethane	50.00	33.10	66	10	30	30- 95
Indeno(1,2,3-cd)pyrene	50.00	46.06	92	0	30	45-125
Isophorone	50.00	43.40	87	2	30	50-110
2-Methylnaphthalene	50.00	45.47	91	4	30	45-105
Naphthalene	50.00	41.05	82	4	30	40-100
2-Methylphenol	50.00	34.72	69	3	30	40-110
4-Methylphenol	50.00	31.34	63	2	30	30-110
2-Nitroaniline	50.00	42.34	85	3	30	50-115
3-Nitroaniline	50.00	36.71	73	10	30	20-125
4-Nitroaniline	50.00	51.01	102	14	30	35-120
Nitrobenzene	50.00	37.26	74	2	30	45-110
2-Nitrophenol	50.00	49.88	100	6	30	40-115

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0703BW1

COMPOUND	SPIKE ADDED (UG/L)	LCSD CONCENTRATION (UG/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
4-Nitrophenol	50.00	13.55	27	0	30	0-125
N-Nitrosodiphenylamine	50.00	41.10	82	3	30	50-110
N-Nitroso-di-n-prop.(1)	50.00	43.80	88	5	30	35-130
Pentachlorophenol	50.00	56.00	112	4	30	40-115
Phenol	50.00	16.28	32	5	30	0-115
Pyrene	50.00	44.13	88	4	30	50-130
1,2,4,5-Tetrachlorobenz	50.00	49.66	99	5	30	50-125
2,4,5-Trichlorophenol	50.00	44.52	89	0	30	50-110
2,4,6-Trichlorophenol	50.00	43.73	87	1	30	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: 1 out of 65 outside limits
Spike Recovery: 7 out of 130 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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0707BS1 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	3119	94	45-110
Acenaphthylene	3333	0.0000	2865	86	45-105
Acetophenone	3333	0.0000	1900	57	35-110
Atrazine	3333	0.0000	2156	65	55-105
Anthracene	3333	0.0000	2820	85	55-105
Benzaldehyde	3333	0.0000	130.6	4*	10-160
Benzo(a)anthracene	3333	0.0000	2564	77	50-110
Benzo(b)fluoranthene	3333	0.0000	2894	87	45-115
Benzo(k)fluoranthene	3333	0.0000	2388	72	45-125
Benzo(g,h,i)perylene	3333	0.0000	3361	101	40-125
Benzo(a)pyrene	3333	0.0000	2670	80	50-110
1,1'-Biphenyl	3333	0.0000	2687	81	45-110
bis(2-Chloroethoxy)meth	3333	0.0000	2573	77	45-110
bis(2-Chloroethyl)ether	3333	0.0000	2707	81	40-105
bis(2-Chloroisopropyl)e	3333	0.0000	2628	79	20-115
Bis(2-ethylhexyl)phthal	3333	0.0000	2605	78	45-125
4-Bromophenyl-phenyleth	3333	0.0000	2211	66	45-115
Butylbenzylphthalate	3333	0.0000	2590	78	50-125
Caprolactam	3333	0.0000	2793	84	50-110
Carbazole	3333	0.0000	2532	76	45-115
4-Chloroaniline	3333	0.0000	2328	70	10- 95
4-Chloro-3-methylphenol	3333	0.0000	2839	85	45-115
2-Chloronaphthalene	3333	0.0000	2758	83	45-105
2-Chlorophenol	3333	0.0000	2802	84	45-105
4-Chlorophenyl-phenylet	3333	0.0000	2734	82	45-110
Chrysene	3333	0.0000	2796	84	55-110
Dibenz(a,h)anthracene	3333	0.0000	2919	88	40-125
Dibenzofuran	3333	0.0000	2787	84	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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0707BS1 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	1947	58	19-130
2,4-Dichlorophenol	3333	0.0000	2593	78	45-110
Diethylphthalate	3333	0.0000	3174	95	50-115
2,4-Dimethylphenol	3333	0.0000	2659	80	30-105
Dimethylphthalate	3333	0.0000	2758	83	50-110
Di-n-butylphthalate	3333	0.0000	2980	89	55-110
4,6-Dinitro-2-methylphe	3333	0.0000	3740	112	30-135
2,4-Dinitrophenol	3333	0.0000	4758	143*	15-130
2,4-Dinitrotoluene	3333	0.0000	2999	90	50-115
2,6-Dinitrotoluene	3333	0.0000	2752	82	50-110
Di-n-octylphthalate	3333	0.0000	2636	79	40-130
Fluoranthene	3333	0.0000	2830	85	55-115
Fluorene	3333	0.0000	2792	84	50-110
Hexachlorobenzene	3333	0.0000	2731	82	45-120
Hexachlorobutadiene	3333	0.0000	2554	77	30-110
Hexachlorocyclopentadie	3333	0.0000	1390	42	10-110
Hexachloroethane	3333	0.0000	2728	82	35-110
Indeno(1,2,3-cd)pyrene	3333	0.0000	2976	89	40-120
Isophorone	3333	0.0000	2572	77	45-110
2-Methylnaphthalene	3333	0.0000	2961	89	40-110
Naphthalene	3333	0.0000	2795	84	40-105
2-Methylphenol	3333	0.0000	2835	85	40-105
4-Methylphenol	3333	0.0000	2864	86	40-105
2-Nitroaniline	3333	0.0000	2510	75	45-120
3-Nitroaniline	3333	0.0000	2751	82	25-110
4-Nitroaniline	3333	0.0000	3481	104	35-115
Nitrobenzene	3333	0.0000	2223	67	40-115
2-Nitrophenol	3333	0.0000	2876	86	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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0707BS1 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	2064	62	15-140
N-Nitrosodiphenylamine	3333	0.0000	2473	74	50-115
N-Nitroso-di-n-prop.(1)	3333	0.0000	2677	80	40-115
Pentachlorophenol	3333	0.0000	3020	91	25-120
Phenol	3333	0.0000	2698	81	40-100
Pyrene	3333	0.0000	2279	68	45-125
1,2,4,5-Tetrachlorobenz	3333	0.0000	2946	88	50-150
2,4,5-Trichlorophenol	3333	0.0000	2612	78	50-110
2,4,6-Trichlorophenol	3333	0.0000	2646	79	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: 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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0709BS1 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	2853	86	45-110
Acenaphthylene	3333	0.0000	2705	81	45-105
Acetophenone	3333	0.0000	1635	49	35-110
Atrazine	3333	0.0000	1963	59	55-105
Anthracene	3333	0.0000	2654	80	55-105
Benzaldehyde	3333	0.0000	0.0000	0*	10-160
Benzo(a)anthracene	3333	0.0000	2481	74	50-110
Benzo(b)fluoranthene	3333	0.0000	2429	73	45-115
Benzo(k)fluoranthene	3333	0.0000	2720	82	45-125
Benzo(g,h,i)perylene	3333	0.0000	3018	90	40-125
Benzo(a)pyrene	3333	0.0000	2615	78	50-110
1,1'-Biphenyl	3333	0.0000	2446	73	45-110
bis(2-Chloroethoxy)meth	3333	0.0000	2425	73	45-110
bis(2-Chloroethyl)ether	3333	0.0000	2443	73	40-105
bis(2-Chloroisopropyl)e	3333	0.0000	2294	69	20-115
Bis(2-ethylhexyl)phthal	3333	0.0000	2722	82	45-125
4-Bromophenyl-phenyleth	3333	0.0000	2161	65	45-115
Butylbenzylphthalate	3333	0.0000	2515	75	50-125
Caprolactam	3333	0.0000	2809	84	50-110
Carbazole	3333	0.0000	2532	76	45-115
4-Chloroaniline	3333	0.0000	2198	66	10- 95
4-Chloro-3-methylphenol	3333	0.0000	2534	76	45-115
2-Chloronaphthalene	3333	0.0000	2583	77	45-105
2-Chlorophenol	3333	0.0000	2580	77	45-105
4-Chlorophenyl-phenylet	3333	0.0000	2589	78	45-110
Chrysene	3333	0.0000	2550	76	55-110
Dibenz(a,h)anthracene	3333	0.0000	2734	82	40-125
Dibenzofuran	3333	0.0000	2629	79	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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0709BS1 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	1829	55	19-130
2,4-Dichlorophenol	3333	0.0000	2408	72	45-110
Diethylphthalate	3333	0.0000	2927	88	50-115
2,4-Dimethylphenol	3333	0.0000	2536	76	30-105
Dimethylphthalate	3333	0.0000	2584	78	50-110
Di-n-butylphthalate	3333	0.0000	2787	84	55-110
4,6-Dinitro-2-methylphe	3333	0.0000	2808	84	30-135
2,4-Dinitrophenol	3333	0.0000	3744	112	15-130
2,4-Dinitrotoluene	3333	0.0000	2743	82	50-115
2,6-Dinitrotoluene	3333	0.0000	2522	76	50-110
Di-n-octylphthalate	3333	0.0000	2843	85	40-130
Fluoranthene	3333	0.0000	2543	76	55-115
Fluorene	3333	0.0000	2680	80	50-110
Hexachlorobenzene	3333	0.0000	2699	81	45-120
Hexachlorobutadiene	3333	0.0000	2307	69	30-110
Hexachlorocyclopentadie	3333	0.0000	1210	36	10-110
Hexachloroethane	3333	0.0000	2356	71	35-110
Indeno(1,2,3-cd)pyrene	3333	0.0000	2797	84	40-120
Isophorone	3333	0.0000	2423	73	45-110
2-Methylnaphthalene	3333	0.0000	2584	78	40-110
Naphthalene	3333	0.0000	2569	77	40-105
2-Methylphenol	3333	0.0000	2604	78	40-105
4-Methylphenol	3333	0.0000	2702	81	40-105
2-Nitroaniline	3333	0.0000	2326	70	45-120
3-Nitroaniline	3333	0.0000	2617	78	25-110
4-Nitroaniline	3333	0.0000	3793	114	35-115
Nitrobenzene	3333	0.0000	2274	68	40-115
2-Nitrophenol	3333	0.0000	2542	76	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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0709BS1 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	2009	60	15-140
N-Nitrosodiphenylamine	3333	0.0000	2440	73	50-115
N-Nitroso-di-n-prop.(1)	3333	0.0000	2430	73	40-115
Pentachlorophenol	3333	0.0000	2359	71	25-120
Phenol	3333	0.0000	2533	76	40-100
Pyrene	3333	0.0000	2346	70	45-125
1,2,4,5-Tetrachlorobenz	3333	0.0000	2623	79	50-150
2,4,5-Trichlorophenol	3333	0.0000	2494	75	50-110
2,4,6-Trichlorophenol	3333	0.0000	2418	72	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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0709BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	LCSD CONCENTRATION (UG/KG)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acenaphthene	3333	2717	82	5	30	45-110
Acenaphthylene	3333	2515	75	7	30	45-105
Acetophenone	3333	1541	46	6	30	35-110
Atrazine	3333	1980	59	1	30	55-105
Anthracene	3333	2597	78	2	30	55-105
Benzaldehyde	3333	0.0000	0*		30	10-160
Benzo(a)anthracene	3333	2435	73	2	30	50-110
Benzo(b)fluoranthene	3333	2526	76	4	30	45-115
Benzo(k)fluoranthene	3333	2606	78	4	30	45-125
Benzo(g,h,i)perylene	3333	2790	84	8	30	40-125
Benzo(a)pyrene	3333	2567	77	2	30	50-110
1,1'-Biphenyl	3333	2360	71	4	30	45-110
bis(2-Chloroethoxy)meth	3333	2199	66	10	30	45-110
bis(2-Chloroethyl)ether	3333	2130	64	14	30	40-105
bis(2-Chloroisopropyl)e	3333	2140	64	7	30	20-115
Bis(2-ethylhexyl)phthal	3333	2867	86	5	30	45-125
4-Bromophenyl-phenyleth	3333	2086	62	4	30	45-115
Butylbenzylphthalate	3333	2650	80	5	30	50-125
Caprolactam	3333	2759	83	2	30	50-110
Carbazole	3333	2503	75	1	30	45-115
4-Chloroaniline	3333	1867	56	16	30	10- 95
4-Chloro-3-methylphenol	3333	2350	70	8	30	45-115
2-Chloronaphthalene	3333	2408	72	7	30	45-105
2-Chlorophenol	3333	2303	69	11	30	45-105
4-Chlorophenyl-phenylet	3333	2497	75	4	30	45-110
Chrysene	3333	2501	75	2	30	55-110
Dibenz(a,h)anthracene	3333	2536	76	8	30	40-125
Dibenzofuran	3333	2518	76	4	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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0709BS1 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	1598	48	13	30	19-130
2,4-Dichlorophenol	3333	2207	66	9	30	45-110
Diethylphthalate	3333	2867	86	2	30	50-115
2,4-Dimethylphenol	3333	2136	64	17	30	30-105
Dimethylphthalate	3333	2495	75	4	30	50-110
Di-n-butylphthalate	3333	2813	84	1	30	55-110
4,6-Dinitro-2-methylphe	3333	2354	71	18	30	30-135
2,4-Dinitrophenol	3333	2706	81	32*	30	15-130
2,4-Dinitrotoluene	3333	2616	78	5	30	50-115
2,6-Dinitrotoluene	3333	2447	73	3	30	50-110
Di-n-octylphthalate	3333	3125	94	9	30	40-130
Fluoranthene	3333	2477	74	3	30	55-115
Fluorene	3333	2528	76	6	30	50-110
Hexachlorobenzene	3333	2604	78	4	30	45-120
Hexachlorobutadiene	3333	2079	62	10	30	30-110
Hexachlorocyclopentadie	3333	1023	31	17	30	10-110
Hexachloroethane	3333	2111	63	11	30	35-110
Indeno(1,2,3-cd)pyrene	3333	2571	77	8	30	40-120
Isophorone	3333	2194	66	10	30	45-110
2-Methylnaphthalene	3333	2335	70	10	30	40-110
Naphthalene	3333	2324	70	10	30	40-105
2-Methylphenol	3333	2381	71	9	30	40-105
4-Methylphenol	3333	2441	73	10	30	40-105
2-Nitroaniline	3333	2188	66	6	30	45-120
3-Nitroaniline	3333	2786	84	6	30	25-110
4-Nitroaniline	3333	3497	105	8	30	35-115
Nitrobenzene	3333	2089	63	8	30	40-115
2-Nitrophenol	3333	2123	64	18	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.: ARC.B07029

Matrix Spike - Client Sample No.: SBLK0709BS1 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	1784	54	12	30	15-140
N-Nitrosodiphenylamine	3333	2329	70	5	30	50-115
N-Nitroso-di-n-prop.(1)	3333	2205	66	10	30	40-115
Pentachlorophenol	3333	2236	67	5	30	25-120
Phenol	3333	2214	66	13	30	40-100
Pyrene	3333	2448	73	4	30	45-125
1,2,4,5-Tetrachlorobenz	3333	2459	74	6	30	50-150
2,4,5-Trichlorophenol	3333	2328	70	7	30	50-110
2,4,6-Trichlorophenol	3333	2279	68	6	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: 1 out of 65 outside limits
Spike Recovery: 2 out of 130 outside limits

COMMENTS: _____

FORM 3

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: ASB009 (0-1) Lab Sample ID: 0807029-03

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
Acenaphthene	4504	0.0000	3815	85	45-110
Acenaphthylene	4504	0.0000	3536	78	45-105
Acetophenone	4504	0.0000	2229	49	35-110
Atrazine	4504	0.0000	2728	60	55-105
Anthracene	4504	0.0000	3568	79	55-105
Benzaldehyde	4504	0.0000	0.0000	0*	10-160
Benzo(a)anthracene	4504	0.0000	3141	70	50-110
Benzo(b)fluoranthene	4504	0.0000	3483	77	45-115
Benzo(k)fluoranthene	4504	0.0000	3426	76	45-125
Benzo(g,h,i)perylene	4504	0.0000	3234	72	40-125
Benzo(a)pyrene	4504	0.0000	3348	74	50-110
1,1'-Biphenyl	4504	0.0000	3334	74	45-110
bis(2-Chloroethoxy)meth	4504	0.0000	3128	69	45-110
bis(2-Chloroethyl)ether	4504	0.0000	3269	72	40-105
bis(2-Chloroisopropyl)e	4504	0.0000	3147	70	20-115
Bis(2-ethylhexyl)phthal	4504	0.0000	3280	73	45-125
4-Bromophenyl-phenyleth	4504	0.0000	2780	62	45-115
Butylbenzylphthalate	4504	0.0000	3279	73	50-125
Caprolactam	4504	0.0000	3893	86	50-110
Carbazole	4504	0.0000	3312	74	45-115
4-Chloroaniline	4504	0.0000	3026	67	10- 95
4-Chloro-3-methylphenol	4504	0.0000	3536	78	45-115
2-Chloronaphthalene	4504	0.0000	3373	75	45-105
2-Chlorophenol	4504	0.0000	3392	75	45-105
4-Chlorophenyl-phenylet	4504	0.0000	3377	75	45-110
Chrysene	4504	0.0000	3370	75	55-110
Dibenz(a,h)anthracene	4504	0.0000	3123	69	40-125
Dibenzofuran	4504	0.0000	3434	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 MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: ASB009 (0-1) Lab Sample ID: 0807029-03

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	4504	0.0000	2702	60	19-130
2,4-Dichlorophenol	4504	0.0000	3281	73	45-110
Diethylphthalate	4504	0.0000	3818	85	50-115
2,4-Dimethylphenol	4504	0.0000	3551	79	30-105
Dimethylphthalate	4504	0.0000	3334	74	50-110
Di-n-butylphthalate	4504	123.8	6097	133*	55-110
4,6-Dinitro-2-methylphe	4504	0.0000	3736	83	30-135
2,4-Dinitrophenol	4504	0.0000	3676	82	15-130
2,4-Dinitrotoluene	4504	0.0000	4083	91	50-115
2,6-Dinitrotoluene	4504	0.0000	3402	76	50-110
Di-n-octylphthalate	4504	0.0000	4289	95	40-130
Fluoranthene	4504	0.0000	3434	76	55-115
Fluorene	4504	0.0000	3498	78	50-110
Hexachlorobenzene	4504	0.0000	3491	78	45-120
Hexachlorobutadiene	4504	0.0000	2996	66	30-110
Hexachlorocyclopentadie	4504	0.0000	1616	36	10-110
Hexachloroethane	4504	0.0000	3210	71	35-110
Indeno(1,2,3-cd)pyrene	4504	0.0000	3076	68	40-120
Isophorone	4504	0.0000	3109	69	45-110
2-Methylnaphthalene	4504	0.0000	3567	79	40-110
Naphthalene	4504	0.0000	3367	75	40-105
2-Methylphenol	4504	0.0000	3521	78	40-105
4-Methylphenol	4504	0.0000	3571	79	40-105
2-Nitroaniline	4504	0.0000	3105	69	45-120
3-Nitroaniline	4504	0.0000	3506	78	25-110
4-Nitroaniline	4504	0.0000	4225	94	35-115
Nitrobenzene	4504	0.0000	2751	61	40-115
2-Nitrophenol	4504	0.0000	3583	80	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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: ASB009 (0-1) Lab Sample ID: 0807029-03

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
4-Nitrophenol	4504	0.0000	2329	52	15-140
N-Nitrosodiphenylamine	4504	0.0000	3292	73	50-115
N-Nitroso-di-n-prop.(1)	4504	0.0000	3172	70	40-115
Pentachlorophenol	4504	0.0000	3560	79	25-120
Phenol	4504	0.0000	3289	73	40-100
Pyrene	4504	0.0000	2926	65	45-125
1,2,4,5-Tetrachlorobenz	4504	0.0000	3569	79	50-150
2,4,5-Trichlorophenol	4504	0.0000	3356	74	50-110
2,4,6-Trichlorophenol	4504	0.0000	3318	74	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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: ASB009 (0-1) Lab Sample ID: 0807029-03

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Acenaphthene	4504	3491	78	9	30	45-110
Acenaphthylene	4504	3283	73	7	30	45-105
Acetophenone	4504	2000	44	11	30	35-110
Atrazine	4504	2556	57	6	30	55-105
Anthracene	4504	3346	74	6	30	55-105
Benzaldehyde	4504	0.0000	0*		30	10-160
Benzo(a)anthracene	4504	2964	66	6	30	50-110
Benzo(b)fluoranthene	4504	3005	67	15	30	45-115
Benzo(k)fluoranthene	4504	3390	75	1	30	45-125
Benzo(g,h,i)perylene	4504	3127	69	3	30	40-125
Benzo(a)pyrene	4504	3138	70	6	30	50-110
1,1'-Biphenyl	4504	3005	67	10	30	45-110
bis(2-Chloroethoxy)meth	4504	2816	62	10	30	45-110
bis(2-Chloroethyl)ether	4504	2825	63	14	30	40-105
bis(2-Chloroisopropyl)e	4504	2803	62	12	30	20-115
Bis(2-ethylhexyl)phthal	4504	3058	68	7	30	45-125
4-Bromophenyl-phenyleth	4504	2558	57	8	30	45-115
Butylbenzylphthalate	4504	2988	66	9	30	50-125
Caprolactam	4504	3486	77	11	30	50-110
Carbazole	4504	2958	66	11	30	45-115
4-Chloroaniline	4504	2818	62	7	30	10- 95
4-Chloro-3-methylphenol	4504	3317	74	6	30	45-115
2-Chloronaphthalene	4504	3034	67	10	30	45-105
2-Chlorophenol	4504	3026	67	11	30	45-105
4-Chlorophenyl-phenylet	4504	3162	70	6	30	45-110
Chrysene	4504	3110	69	8	30	55-110
Dibenz(a,h)anthracene	4504	3016	67	3	30	40-125
Dibenzofuran	4504	3220	71	6	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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: ASB009 (0-1) Lab Sample ID: 0807029-03

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	4504	2662	59	1	30	19-130
2,4-Dichlorophenol	4504	2981	66	10	30	45-110
Diethylphthalate	4504	3631	81	5	30	50-115
2,4-Dimethylphenol	4504	3187	71	11	30	30-105
Dimethylphthalate	4504	3150	70	6	30	50-110
Di-n-butylphthalate	4504	3708	80	49*	30	55-110
4,6-Dinitro-2-methylphe	4504	3794	84	2	30	30-135
2,4-Dinitrophenol	4504	4764	106	26	30	15-130
2,4-Dinitrotoluene	4504	3469	77	16	30	50-115
2,6-Dinitrotoluene	4504	3137	70	8	30	50-110
Di-n-octylphthalate	4504	3720	82	14	30	40-130
Fluoranthene	4504	3385	75	1	30	55-115
Fluorene	4504	3302	73	6	30	50-110
Hexachlorobenzene	4504	3197	71	9	30	45-120
Hexachlorobutadiene	4504	2642	59	12	30	30-110
Hexachlorocyclopentadie	4504	1567	35	3	30	10-110
Hexachloroethane	4504	2785	62	14	30	35-110
Indeno(1,2,3-cd)pyrene	4504	3011	67	2	30	40-120
Isophorone	4504	2821	63	10	30	45-110
2-Methylnaphthalene	4504	3289	73	8	30	40-110
Naphthalene	4504	3021	67	11	30	40-105
2-Methylphenol	4504	3072	68	14	30	40-105
4-Methylphenol	4504	3220	71	10	30	40-105
2-Nitroaniline	4504	2891	64	7	30	45-120
3-Nitroaniline	4504	3206	71	9	30	25-110
4-Nitroaniline	4504	4138	92	2	30	35-115
Nitrobenzene	4504	2451	54	12	30	40-115
2-Nitrophenol	4504	3197	71	11	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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix Spike - Client Sample No.: ASB009 (0-1) Lab Sample ID: 0807029-03

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
4-Nitrophenol	4504	2451	54	5	30	15-140
N-Nitrosodiphenylamine	4504	2910	65	12	30	50-115
N-Nitroso-di-n-prop.(1)	4504	2861	64	10	30	40-115
Pentachlorophenol	4504	3600	80	1	30	25-120
Phenol	4504	2966	66	10	30	40-100
Pyrene	4504	2544	56	14	30	45-125
1,2,4,5-Tetrachlorobenz	4504	3245	72	10	30	50-150
2,4,5-Trichlorophenol	4504	3187	71	5	30	50-110
2,4,6-Trichlorophenol	4504	3086	68	7	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: 1 out of 65 outside limits
Spike Recovery: 3 out of 130 outside limits

COMMENTS: _____

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0703BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: S1BW0703 Lab Sample ID: SBLK0703BW1

Instrument ID: BNA3 Date Extracted: 07/03/08

Matrix: (soil/water) WATER Date Analyzed: 07/08/08

Level:(low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 0716

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0703BW1L	SBLK0703BW1LCS	S1LW0703	07/08/08
02	SBLK0703BW1L	SBLK0703BW1LCS	S1DW0703	07/08/08
03	EB-2 (063008	0807029-12	0702912	07/08/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0703BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) WATER Lab Sample ID: SBLK0703BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0703

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/03/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/08/08 07:16

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	0.80	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

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0703BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) WATER Lab Sample ID: SBLK0703BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0703

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/03/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/08/08 07:16

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
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		UY
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		UY
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 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0707BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: S1BS0707 Lab Sample ID: SBLK0707BS1

Instrument ID: BNA3 Date Extracted: 07/07/08

Matrix: (soil/water) SOIL Date Analyzed: 07/09/08

Level:(low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1358

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0707BS1L	SBLK0707BS1LCS	S1LS0707	07/09/08
02	ASB010 (0-1)	0807029-01	0702901	07/09/08
03	ASB010 (5-6)	0807029-02	0702902	07/09/08
04	ASB009 (0-1)	0807029-03	0702903	07/09/08
05	ASB009 (5-6)	0807029-04	0702904	07/09/08
06	ASB008 (0-1)	0807029-05	0702905	07/09/08
07	ASB008 (5-6)	0807029-06	0702906	07/09/08
08	ASB007 (0-1)	0807029-07	0702907	07/09/08
09	ASB007 (5-6)	0807029-08	0702908	07/09/08
10	ASB005 (0-1)	0807029-09	0702909	07/09/08
11	ASBDUP001 (0	0807029-10	0702910	07/09/08
12	ASB003 (0-1)	0807029-11	0702911	07/09/08
13	ASB006 (5-6)	0807029-14	0702914	07/09/08
14	ASB009 (0-1)	0807029-03MS	0702903M	07/10/08
15	ASB009 (0-1)	0807029-03MSD	0702903S	07/10/08
16	ASB005 (0-1)	0807029-09DL	0702909D	07/10/08
17	ASBDUP001 (0	0807029-10DL	0702910D	07/11/08
18	ASB003 (0-1)	0807029-11DL	0702911D	07/11/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0707BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0707BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0707

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 13:58

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		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		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		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		UY
131-11-3	Dimethylphthalate	30	330		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0707BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0707BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0707

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/07/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/09/08 13:58

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	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		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		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

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0709BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: S1BS0709 Lab Sample ID: SBLK0709BS1

Instrument ID: BNA3 Date Extracted: 07/09/08

Matrix: (soil/water) SOIL Date Analyzed: 07/10/08

Level:(low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 1502

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0709BS1L	SBLK0709BS1LCS	S1LS0709	07/10/08
02	SBLK0709BS1L	SBLK0709BS1LCS	S1DS0709	07/10/08
03	ASB006 (0-1)	0807029-13	0702913RE	07/11/08
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0709BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0709BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0709

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 07/09/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/10/08 15:02

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		UY
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		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.

SBLK0709BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0709BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0709

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/09/08

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 07/10/08 15:02

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	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		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		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

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
	BNACAL100PPM	BNACAL100PPM	CAL100	05/16/07	1218
01	BNACAL90PPM	BNACAL90PPM	CAL090	05/16/07	1247
02	BNACAL80PPM	BNACAL80PPM	CAL080	05/16/07	1317
03	BNACAL60PPM	BNACAL60PPM	CAL060	05/16/07	1417
04	BNACAL50PPM	BNACAL50PPM	CAL050	05/16/07	1447
05	BNACAL40PPM	BNACAL40PPM	CAL040	05/16/07	1517
06	BNACAL30PPM	BNACAL30PPM	CAL030	05/16/07	1546
07	BNACAL20PPM	BNACAL20PPM	CAL020	05/16/07	1616
08	BNACAL10PPM	BNACAL10PPM	CAL010	05/16/07	1645
09	BNACAL5PPM	BNACAL5PPM	CAL005	05/16/07	1715
10	BNACAL2PPM	BNACAL2PPM	CAL002	05/16/07	1744
11	BNACAL1PPM	BNACAL1PPM	CAL001	05/16/07	1813
12		BNACAL2PPM	CALB002	05/16/07	1843
13		BNACAL5PPM	CALB005	05/16/07	1912
14		BNACAL10PPM	CALB010	05/16/07	1941
15		BNACAL20PPM	CALB020	05/16/07	2011
16		BNACAL30PPM	CALB030	05/16/07	2039
17		BNACAL30PPM	CALB040	05/16/07	2108
18		BNACAL50PPM	CALB050	05/16/07	2137
19		BNACAL60PPM	CALB060	05/16/07	2206
20		BNACAL70PPM	CALB070	05/16/07	2235
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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.: 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 198	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: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: DF0708B1 DFTPP Injection Date: 07/08/08

Instrument ID: BNA3 DFTPP Injection Time: 0534

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	40.2
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	44.9
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	40.0 - 60.0% of mass 198	53.1
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	6.9
275	10.0 - 30.0% of mass 198	26.8
365	Greater than 1.0% of mass 198	3.39
441	Present, but less than mass 443	10.6
442	Greater than 40.0% of mass 198	68.0
443	17.0 - 23.0% of mass 442	13.1 (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	BNA50PPM	BNA50PPM	CCV050W	07/08/08	0555
02	SBLK0703BW1L	SBLK0703BW1LCS	S1LW0703	07/08/08	0622
03	SBLK0703BW1L	SBLK0703BW1LCS	S1DW0703	07/08/08	0649
04	SBLK0703BW1	SBLK0703BW1	S1BW0703	07/08/08	0716
05	EB-2 (063008	0807029-12	0702912	07/08/08	0838
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: DF0709B1 DFTPP Injection Date: 07/09/08

Instrument ID: BNA3 DFTPP Injection Time: 1309

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	41.1
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	46.0
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	40.0 - 60.0% of mass 198	53.4
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	6.9
275	10.0 - 30.0% of mass 198	28.1
365	Greater than 1.0% of mass 198	3.94
441	Present, but less than mass 443	11.1
442	Greater than 40.0% of mass 198	67.8
443	17.0 - 23.0% of mass 442	12.9 (19.1)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	BNA50PPM	BNA50PPM	CCV050	07/09/08	1331
02	SBLK0707BS1	SBLK0707BS1	S1BS0707	07/09/08	1358
03	SBLK0707BS1L	SBLK0707BS1LCS	S1LS0707	07/09/08	1426
04	ASB010 (0-1)	0807029-01	0702901	07/09/08	1641
05	ASB010 (5-6)	0807029-02	0702902	07/09/08	1708
06	ASB009 (0-1)	0807029-03	0702903	07/09/08	1735
07	ASB009 (5-6)	0807029-04	0702904	07/09/08	1803
08	ASB008 (0-1)	0807029-05	0702905	07/09/08	1830
09	ASB008 (5-6)	0807029-06	0702906	07/09/08	1857
10	ASB007 (0-1)	0807029-07	0702907	07/09/08	1924
11	ASB007 (5-6)	0807029-08	0702908	07/09/08	1951
12	ASB005 (0-1)	0807029-09	0702909	07/09/08	2018
13	ASBDUP001 (0	0807029-10	0702910	07/09/08	2045
14	ASB003 (0-1)	0807029-11	0702911	07/09/08	2112
15	ASB006 (5-6)	0807029-14	0702914	07/09/08	2206
16	ASB009 (0-1)	0807029-03MS	0702903M	07/10/08	0021
17	ASB009 (0-1)	0807029-03MSD	0702903S	07/10/08	0048
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: DF0710B1 DFTPP Injection Date: 07/10/08

Instrument ID: BNA3 DFTPP Injection Time: 1007

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	43.8
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	54.5
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	25.0
365	Greater than 1.0% of mass 198	3.36
441	Present, but less than mass 443	8.7
442	Greater than 40.0% of mass 198	54.6
443	17.0 - 23.0% of mass 442	11.2 (20.5)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	BNA50PPM	BNA50PPM	CCV050	07/10/08	1029
02	SBLK0709BS1L	SBLK0709BS1LCS	S1LS0709	07/10/08	1407
03	SBLK0709BS1L	SBLK0709BS1LCS	S1DS0709	07/10/08	1435
04	SBLK0709BS1	SBLK0709BS1	S1BS0709	07/10/08	1502
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: DF0710B2 DFTPP Injection Date: 07/10/08

Instrument ID: BNA3 DFTPP Injection Time: 2256

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	43.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	49.8
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	40.0 - 60.0% of mass 198	55.3
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	27.1
365	Greater than 1.0% of mass 198	3.63
441	Present, but less than mass 443	9.6
442	Greater than 40.0% of mass 198	59.1
443	17.0 - 23.0% of mass 442	11.4 (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	BNA50PPM	BNA50PPM	CCV050E	07/10/08	2317
02	ASB005 (0-1)	0807029-09DL	0702909D	07/10/08	2344
03	ASBDUP001 (0	0807029-10DL	0702910D	07/11/08	0011
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID: DF0711B1 DFTPP Injection Date: 07/11/08

Instrument ID: BNA3 DFTPP Injection Time: 0902

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	43.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	49.0
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	40.0 - 60.0% of mass 198	54.0
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	26.9
365	Greater than 1.0% of mass 198	3.18
441	Present, but less than mass 443	8.4
442	Greater than 40.0% of mass 198	57.1
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	BNA50PPM	BNA50PPM	CCV050	07/11/08	0923
02	ASB006 (0-1)	0807029-13	0702913RE	07/11/08	1020
03	ASB003 (0-1)	0807029-11DL	0702911D	07/11/08	1048
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FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050W Date Analyzed: 07/08/08

Instrument ID: BNA3 Time Analyzed: 0555

		IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
	12 HOUR STD	601926	3.15	2132589	4.43	1136325	6.32
	UPPER LIMIT	1203852	3.65	4265178	4.93	2272650	6.82
	LOWER LIMIT	300963	2.65	1066295	3.93	568163	5.82
	CLIENT SAMPLE NO.						
01	SBLK0703BW1L	685454	3.15	2474336	4.43	1369300	6.32
02	SBLK0703BW1L	738960	3.15	2740562	4.43	1519113	6.32
03	SBLK0703BW1	729771	3.15	2648876	4.42	1415520	6.32
04	EB-2 (063008	627813	3.15	2307581	4.42	1241821	6.31
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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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050W Date Analyzed: 07/08/08

Instrument ID: BNA3 Time Analyzed: 0555

		IS4 (PHN) AREA #	RT #	IS5 (CRY) AREA #	RT #	IS6 (PRY) AREA #	RT #
	12 HOUR STD	1817358	7.90	1707912	10.74	1203908	12.06
	UPPER LIMIT	3634716	8.40	3415824	11.24	2407816	12.56
	LOWER LIMIT	908679	7.40	853956	10.24	601954	11.56
	CLIENT SAMPLE NO.						
01	SBLK0703BW1L	2232231	7.91	2130540	10.75	1574638	12.06
02	SBLK0703BW1L	2423635	7.91	2203083	10.75	1617157	12.06
03	SBLK0703BW1	2216529	7.90	2164267	10.74	1710189	12.06
04	EB-2 (063008	1982512	7.90	2000185	10.74	1500367	12.06
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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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050 Date Analyzed: 07/09/08

Instrument ID: BNA3 Time Analyzed: 1331

		IS1 (DCB)		IS2 (NPT)		IS3 (ANT)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	462682	3.13	1749297	4.41	955039	6.30
	UPPER LIMIT	925364	3.63	3498594	4.91	1910078	6.80
	LOWER LIMIT	231341	2.63	874649	3.91	477520	5.80
	CLIENT SAMPLE NO.						
01	SBLK0707BS1	545185	3.13	2086750	4.41	1132919	6.30
02	SBLK0707BS1L	635107	3.13	2418965	4.41	1329824	6.30
03	ASB010 (0-1)	601234	3.13	2291728	4.41	1242923	6.30
04	ASB010 (5-6)	630381	3.13	2394261	4.40	1302257	6.30
05	ASB009 (0-1)	616741	3.13	2322911	4.41	1246884	6.30
06	ASB009 (5-6)	550462	3.13	2092271	4.40	1130824	6.30
07	ASB008 (0-1)	587708	3.13	2233190	4.40	1188095	6.30
08	ASB008 (5-6)	538259	3.13	2057359	4.40	1085875	6.29
09	ASB007 (0-1)	602865	3.13	2288436	4.40	1218270	6.30
10	ASB007 (5-6)	616006	3.13	2326094	4.40	1257073	6.29
11	ASB005 (0-1)	536414	3.13	2056956	4.40	1110846	6.30
12	ASBDUP001 (0	615964	3.13	2372686	4.40	1303167	6.29
13	ASB003 (0-1)	616864	3.13	2391576	4.40	1341461	6.30
14	ASB006 (5-6)	613096	3.13	2284801	4.40	1272673	6.29
15	ASB009 (0-1)	680191	3.13	2569512	4.41	1410134	6.30
16	ASB009 (0-1)	692498	3.13	2643641	4.41	1480981	6.30
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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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050 Date Analyzed: 07/09/08

Instrument ID: BNA3 Time Analyzed: 1331

		IS4 (PHN) AREA	#	RT	#	IS5 (CRY) AREA	#	RT	#	IS6 (PRY) AREA	#	RT	#
	12 HOUR STD	1554759		7.88		1616584		10.72		1328083		12.04	
	UPPER LIMIT	3109518		8.38		3233168		11.22		2656166		12.54	
	LOWER LIMIT	777380		7.38		808292		10.22		664042		11.54	
	CLIENT SAMPLE NO.												
01	SBLK0707BS1	1810104		7.89		1773168		10.72		1593859		12.04	
02	SBLK0707BS1L	2195389		7.89		2243340		10.72		1760716		12.04	
03	ASB010 (0-1)	1993818		7.88		2268988		10.72		1873363		12.04	
04	ASB010 (5-6)	2145365		7.88		2588795		10.72		2205723		12.04	
05	ASB009 (0-1)	1974689		7.88		2107487		10.72		1596892		12.04	
06	ASB009 (5-6)	1793236		7.88		2055617		10.72		1590429		12.04	
07	ASB008 (0-1)	1865395		7.88		1996524		10.72		1479331		12.04	
08	ASB008 (5-6)	1717292		7.88		1835444		10.72		1433304		12.04	
09	ASB007 (0-1)	1898626		7.88		1906261		10.72		1372883		12.04	
10	ASB007 (5-6)	2032076		7.88		2175562		10.72		1715283		12.04	
11	ASB005 (0-1)	1771185		7.88		1729572		10.72		1013936		12.04	
12	ASBDUP001 (0	2065453		7.88		2107486		10.72		1389099		12.04	
13	ASB003 (0-1)	2302814		7.89		2666943		10.73		1900477		12.04	
14	ASB006 (5-6)	2032696		7.88		2062406		10.72		1297108		12.04	
15	ASB009 (0-1)	2242952		7.89		2129883		10.73		1200191		12.04	
16	ASB009 (0-1)	2470106		7.89		2654124		10.73		1770316		12.04	
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.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050 Date Analyzed: 07/10/08

Instrument ID: BNA3 Time Analyzed: 1029

		IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
	12 HOUR STD	821759	3.12	3058560	4.39	1665053	6.28
	UPPER LIMIT	1643518	3.62	6117120	4.89	3330106	6.78
	LOWER LIMIT	410880	2.62	1529280	3.89	832527	5.78
	CLIENT SAMPLE NO.						
01	SBLK0709BS1L	864465	3.12	3216544	4.39	1754938	6.28
02	SBLK0709BS1L	783117	3.12	2935455	4.39	1587550	6.28
03	SBLK0709BS1	769723	3.11	2940835	4.38	1590558	6.28
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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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050 Date Analyzed: 07/10/08

Instrument ID: BNA3 Time Analyzed: 1029

		IS4 (PHN) AREA #	RT #	IS5 (CRY) AREA #	RT #	IS6 (PRY) AREA #	RT #
	12 HOUR STD	2749566	7.87	2920808	10.71	2438615	12.03
	UPPER LIMIT	5499132	8.37	5841616	11.21	4877230	12.53
	LOWER LIMIT	1374783	7.37	1460404	10.21	1219308	11.53
	CLIENT SAMPLE NO.						
01	SBLK0709BS1L	2823882	7.87	2452379	10.71	1755136	12.03
02	SBLK0709BS1L	2536373	7.87	2039477	10.71	1335244	12.03
03	SBLK0709BS1	2544346	7.86	2136079	10.70	1355782	12.03
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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

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050E Date Analyzed: 07/10/08

Instrument ID: BNA3 Time Analyzed: 2317

		IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
	12 HOUR STD	559230	3.11	2081200	4.39	1127830	6.28
	UPPER LIMIT	1118460	3.61	4162400	4.89	2255660	6.78
	LOWER LIMIT	279615	2.61	1040600	3.89	563915	5.78
	CLIENT SAMPLE NO.						
01	ASB005 (0-1)	523451	3.11	1964864	4.38	1019949	6.27
02	ASBDUP001 (0	562858	3.11	2088632	4.38	1113001	6.28
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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

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* Values outside of QC limits.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050E Date Analyzed: 07/10/08

Instrument ID: BNA3 Time Analyzed: 2317

		IS4 (PHN) AREA #	RT #	IS5 (CRY) AREA #	RT #	IS6 (PRY) AREA #	RT #
	12 HOUR STD	1850204	7.86	1610176	10.71	912281	12.03
	UPPER LIMIT	3700408	8.36	3220352	11.21	1824562	12.53
	LOWER LIMIT	925102	7.36	805088	10.21	456141	11.53
	CLIENT SAMPLE NO.						
01	ASB005 (0-1)	1572950	7.86	1358948	10.70	858942	12.02
02	ASBDUP001 (0	1717695	7.86	1440263	10.70	908376	12.02
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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
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RT LOWER LIMIT = - 0.50 minutes of internal standard RT

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FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050 Date Analyzed: 07/11/08

Instrument ID: BNA3 Time Analyzed: 0923

		IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
	12 HOUR STD	848748	3.10	3108176	4.37	1694096	6.26
	UPPER LIMIT	1697496	3.60	6216352	4.87	3388192	6.76
	LOWER LIMIT	424374	2.60	1554088	3.87	847048	5.76
	CLIENT SAMPLE NO.						
01	ASB006 (0-1)	891333	3.09	3309145	4.36	1809387	6.25
02	ASB003 (0-1)	785333	3.10	2937669	4.37	1541616	6.26
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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
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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.

FORM 8
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B07029

Lab File ID (Standard): CCV050 Date Analyzed: 07/11/08

Instrument ID: BNA3 Time Analyzed: 0923

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	2691462	7.84	2058070	10.67	1184747	11.99
	UPPER LIMIT	5382924	8.34	4116140	11.17	2369494	12.49
	LOWER LIMIT	1345731	7.34	1029035	10.17	592374	11.49
	CLIENT SAMPLE NO.						
01	ASB006 (0-1)	2801810	7.84	2604771	10.68	1737712	11.99
02	ASB003 (0-1)	2436964	7.84	2316150	10.67	1613078	11.99
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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.

INORGANIC CASE NARRATIVE
Arcadis, Radford
SDG & Work Order# 0807029
July, 2008

Empirical Laboratories ID	Client ID
0807029-01	ASB010 (0-1)
0807029-02	ASB010 (5-6)
0807029-03	ASB009 (0-1)
0807029-04	ASB009 (5-6)
0807029-05	ASB008 (0-1)
0807029-06	ASB008 (5-6)
0807029-07	ASB007 (0-1)
0807029-08	ASB007 (5-6)
0807029-09	ASB005 (0-1)
0807029-10	ASBDUP001 (0-1)
0807029-11	ASB003 (0-1)
0807029-13	ASB006 (0-1)
0807029-14	ASB006 (5-6)

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 & Mercury

A. Continuing Calibration Blanks (CCB) Specification Limits (<±MDL)

1. The third CCB in the first ICAP analysis was out of the specification limits at 1.6 ug/L. All sample concentrations impacted were greater

than ten times the concentration of the blank. There is no impact to the sample data.

B. Preparation Blank (PBS)
Specification Limits (< ½ ±RL)

1. The preparation blank was out of the specification limits for lead at 0.581 mg/kg. All sample concentrations were greater than ten times the concentration in the blank. There is no impact to the sample data.

C. 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 8.9 and 7.7%. on sample ASB009 (0-1). The post digestion spike recovery was at 94.4% for antimony. **All associated data is flagged with an "N" on the final report.**

Arcadis

Parameters Requested

Lab Sample ID	Field ID	Matrix	Date Time Sampled	Parameters requested
0807029-01	ASB010 (0-1)	Soil	06/30/08 3:30:00 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
0807029-02	ASB010 (5-6)	Soil	06/30/08 3:30:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0807029-02	ASB010 (5-6)	Soil	06/30/08 3:30:00 PM	Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0807029-03	ASB009 (0-1)	Soil	06/30/08 4:05:00 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
0807029-04	ASB009 (5-6)	Soil	06/30/08 4:05:00 PM	% Solids
				Aluminum
				Antimony

Lab Sample ID	Field ID	Matrix	Date _Time Sampled	Parameters requested
0807029-04	ASB009 (5-6)	Soil	06/30/08 4:05:00 PM	Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0807029-05	ASB008 (0-1)	Soil	06/30/08 4:25:00 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
0807029-05	ASB008 (0-1)	Soil	06/30/08 4:25:00 PM	Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0807029-06	ASB008 (5-6)	Soil	06/30/08 4:30:00 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
0807029-07	ASB007 (0-1)	Soil	06/30/08 4:35:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0807029-07	ASB007 (0-1)	Soil	06/30/08 4:35:00 PM	Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0807029-08	ASB007 (5-6)	Soil	06/30/08 4:40:00 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
0807029-09	ASB005 (0-1)	Soil	06/30/08 5:15:00 PM	% Solids
				Aluminum
				Antimony

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0807029-09	ASB005 (0-1)	Soil	06/30/08 5:15:00 PM	Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper
				Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0807029-10	ASBDUP001 (0-1)	Soil	06/30/08 5:15:00 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
0807029-10	ASBDUP001 (0-1)	Soil	06/30/08 5:15:00 PM	Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0807029-11	ASB003 (0-1)	Soil	06/30/08 5:30:00 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
0807029-13	ASB006 (0-1)	Soil	06/30/08 5:00:00 PM	% Solids
				Aluminum
				Antimony
				Arsenic
				Barium
				Beryllium
				Cadmium
				Calcium
				Chromium
				Cobalt
				Copper

Lab Sample ID	Field ID	Matrix	Date_Time Sampled	Parameters requested
0807029-13	ASB006 (0-1)	Soil	06/30/08 5:00:00 PM	Iron
				Lead
				Magnesium
				Manganese
				Mercury
				Nickel
				Potassium
				Selenium
				Silver
				Sodium
				Thallium
				Vanadium
				Zinc
0807029-14	ASB006 (5-6)	Solid	06/30/08 5:05:00 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

ARCADIS

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name GP08RAAP.0031.DF000 /RAAP031 (AOCA)

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation SG, MC /ARCADIS

5807029

	Sample ID/Location	Matrix	Date Sampled	Time	Lab ID	SVOCs (8270)	PCBs (8082)	Metals (6010)				Remarks	Total
-01	ASB010 (0-1)	SO	6/30/08	15:50		X	X	X					1
-02	ASB010 (5-6)			15:50		X	X	X					1
-03	ASB009 (0-1)			16:05		X	X	X				*MS/MSD	2
-04	ASB009 (5-6)			16:10		X	X	X					2
-05	ASB008 (0-1)			16:25		X	X	X					1
-06	ASB008 (5-6)			16:30		X	X	X					2
-07	ASB007 (0-1)			16:35		X	X	X					1
-08	ASB007 (5-6)			16:40		X	X	X					2
-09	ASB005 (0-1)			17:15		X	X	X					1
-10	ASBDUP001 (0-1)			17:15		X	X	X					1
-11	ASB003 (0-1)			17:30		X	X	X					1
-12	EB-2 (063008)	L	6/30/08	17:45		X	X	[redacted] SG					4
-13	ASB006-(0-1)										*		
-14	ASB006 (5-6)										*		

Total No. of Bottles/Containers: 19

Sample Matrix: L = Liquid; S = Solid; A = Air SO = Soil

* Samples ASB006 (0-1) & ASB006 (5-6) rec'd + not on COC! Added to WO. WS

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 7/1/08	Time 16:30	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes	No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical	Date 7/2/08	Time 09:00	Yes	No N/A

Special Instructions/Remarks: (1) low volume for samples (2) please contact with any questions

2.8C

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0807029 COC ID(s): 070108-1

Client Arcadis Project Radford

Sample Custodian WS Today's Date 7/2/08

Date/Time Samples Received 7/2/08 09:00

Airbill Number Fedex

Cooler Opened: Date 7/2/08

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): 7/1/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓

Frozen _____

# of Coolers 1 Temp. of Coolers 2.8°C

Condition of Bottles in Shipment: Broken Leaking Intact Missing

If broken or leaking list sample ID#s and bottle types affected:

Comments:

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

SOW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
ASB010 (0-1)	0807029-01
ASB010 (5-6)	0807029-02
ASB009 (0-1)	0807029-03
ASB009 (0-1)S	0807029-03S
ASB009 (0-1)SD	0807029-03SD
ASB009 (5-6)	0807029-04
ASB008 (0-1)	0807029-05
ASB008 (5-6)	0807029-06
ASB007 (0-1)	0807029-07
ASB007 (5-6)	0807029-08
ASB005 (0-1)	0807029-09
ASBDUP001 (0-1)	0807029-10
ASB003 (0-1)	0807029-11
ASB006 (0-1)	0807029-13
ASB006 (5-6)	0807029-14

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.

ASB010 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-01

Level (low/med): LOW Date Received: 07/02/08

% 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	38800			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	6.3			P
7440-39-3	Barium	55.5			P
7440-41-7	Beryllium	0.71	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	1480			P
7440-47-3	Chromium	47.3			P
7440-48-4	Cobalt	3.6	B		P
7440-50-8	Copper	18.7			P
7439-89-6	Iron	56400			P
7439-92-1	Lead	18.5			P
7439-95-4	Magnesium	1540			P
7439-96-5	Manganese	117			P
7439-97-6	Mercury	0.18			AV
7440-02-0	Nickel	10.6			P
7440-09-7	Potassium	967	B		P
7782-49-2	Selenium	1.0	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	98.2			P
7440-66-6	Zinc	52.7			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB010 (5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-02

Level (low/med): LOW Date Received: 07/02/08

% 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	42300			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	3.6			P
7440-39-3	Barium	74.2			P
7440-41-7	Beryllium	0.94	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	251	U		P
7440-47-3	Chromium	41.3			P
7440-48-4	Cobalt	6.4			P
7440-50-8	Copper	20.1			P
7439-89-6	Iron	50100			P
7439-92-1	Lead	20.0			P
7439-95-4	Magnesium	1540			P
7439-96-5	Manganese	364			P
7439-97-6	Mercury	0.029	B		AV
7440-02-0	Nickel	14.7			P
7440-09-7	Potassium	1890			P
7782-49-2	Selenium	1.0	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	91.6			P
7440-66-6	Zinc	58.4			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB009 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-03

Level (low/med): LOW Date Received: 07/02/08

% Solids: 74.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	37100			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	6.4			P
7440-39-3	Barium	74.4			P
7440-41-7	Beryllium	0.79	B		P
7440-43-9	Cadmium	0.27	U		P
7440-70-2	Calcium	1890			P
7440-47-3	Chromium	39.2			P
7440-48-4	Cobalt	5.4			P
7440-50-8	Copper	90.5			P
7439-89-6	Iron	48000			P
7439-92-1	Lead	29.0			P
7439-95-4	Magnesium	1710			P
7439-96-5	Manganese	272			P
7439-97-6	Mercury	0.093			AV
7440-02-0	Nickel	12.7			P
7440-09-7	Potassium	1540			P
7782-49-2	Selenium	1.1	U		P
7440-22-4	Silver	0.27	U		P
7440-23-5	Sodium	546	B		P
7440-28-0	Thallium	0.80	U		P
7440-62-2	Vanadium	86.5			P
7440-66-6	Zinc	123			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB009 (5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-04

Level (low/med): LOW Date Received: 07/02/08

% 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	34800			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	76.9			P
7440-41-7	Beryllium	0.90	B		P
7440-43-9	Cadmium	0.25	U		P
7440-70-2	Calcium	250	U		P
7440-47-3	Chromium	23.0			P
7440-48-4	Cobalt	32.7			P
7440-50-8	Copper	19.2			P
7439-89-6	Iron	46100			P
7439-92-1	Lead	20.6			P
7439-95-4	Magnesium	2170			P
7439-96-5	Manganese	836			P
7439-97-6	Mercury	0.070			AV
7440-02-0	Nickel	14.2			P
7440-09-7	Potassium	2370			P
7782-49-2	Selenium	1.00	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	250	U		P
7440-28-0	Thallium	0.75	U		P
7440-62-2	Vanadium	85.8			P
7440-66-6	Zinc	51.7			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB008 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-05

Level (low/med): LOW Date Received: 07/02/08

% Solids: 74.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38100			P
7440-36-0	Antimony	1.3	U	N	P
7440-38-2	Arsenic	4.2			P
7440-39-3	Barium	42.8			P
7440-41-7	Beryllium	0.78	B		P
7440-43-9	Cadmium	0.27	U		P
7440-70-2	Calcium	1620			P
7440-47-3	Chromium	27.6			P
7440-48-4	Cobalt	3.8	B		P
7440-50-8	Copper	20.2			P
7439-89-6	Iron	47700			P
7439-92-1	Lead	16.3			P
7439-95-4	Magnesium	1700			P
7439-96-5	Manganese	152			P
7439-97-6	Mercury	0.056			AV
7440-02-0	Nickel	12.6			P
7440-09-7	Potassium	1450			P
7782-49-2	Selenium	1.1	B		P
7440-22-4	Silver	0.27	U		P
7440-23-5	Sodium	268	U		P
7440-28-0	Thallium	0.80	U		P
7440-62-2	Vanadium	86.1			P
7440-66-6	Zinc	43.8			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB008 (5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-06

Level (low/med): LOW Date Received: 07/02/08

% Solids: 68.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	35600			P
7440-36-0	Antimony	1.5	U	N	P
7440-38-2	Arsenic	3.3			P
7440-39-3	Barium	78.1			P
7440-41-7	Beryllium	0.88	B		P
7440-43-9	Cadmium	0.29	U		P
7440-70-2	Calcium	420	B		P
7440-47-3	Chromium	24.1			P
7440-48-4	Cobalt	7.4			P
7440-50-8	Copper	20.0			P
7439-89-6	Iron	44300			P
7439-92-1	Lead	10.7			P
7439-95-4	Magnesium	2350			P
7439-96-5	Manganese	232			P
7439-97-6	Mercury	0.028	B		AV
7440-02-0	Nickel	15.2			P
7440-09-7	Potassium	2390			P
7782-49-2	Selenium	1.2	U		P
7440-22-4	Silver	0.29	U		P
7440-23-5	Sodium	294	U		P
7440-28-0	Thallium	0.88	U		P
7440-62-2	Vanadium	85.8			P
7440-66-6	Zinc	53.4			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB007 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-07

Level (low/med): LOW Date Received: 07/02/08

% 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	28600			P
7440-36-0	Antimony	1.1	U	N	P
7440-38-2	Arsenic	4.6			P
7440-39-3	Barium	55.7			P
7440-41-7	Beryllium	0.53	B		P
7440-43-9	Cadmium	0.23	B		P
7440-70-2	Calcium	722	B		P
7440-47-3	Chromium	39.0			P
7440-48-4	Cobalt	4.0			P
7440-50-8	Copper	30.9			P
7439-89-6	Iron	38500			P
7439-92-1	Lead	22.9			P
7439-95-4	Magnesium	1050	B		P
7439-96-5	Manganese	168			P
7439-97-6	Mercury	0.072			AV
7440-02-0	Nickel	8.5			P
7440-09-7	Potassium	922	B		P
7782-49-2	Selenium	0.89	U		P
7440-22-4	Silver	0.22	U		P
7440-23-5	Sodium	223	U		P
7440-28-0	Thallium	0.67	U		P
7440-62-2	Vanadium	74.3			P
7440-66-6	Zinc	48.9			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB007 (5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-08

Level (low/med): LOW Date Received: 07/02/08

% 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	34700			P
7440-36-0	Antimony	1.4	U	N	P
7440-38-2	Arsenic	3.6			P
7440-39-3	Barium	85.3			P
7440-41-7	Beryllium	0.85	B		P
7440-43-9	Cadmium	0.27	U		P
7440-70-2	Calcium	274	U		P
7440-47-3	Chromium	43.8			P
7440-48-4	Cobalt	21.0			P
7440-50-8	Copper	17.7			P
7439-89-6	Iron	44300			P
7439-92-1	Lead	16.0			P
7439-95-4	Magnesium	1230	B		P
7439-96-5	Manganese	772			P
7439-97-6	Mercury	0.086			AV
7440-02-0	Nickel	12.9			P
7440-09-7	Potassium	1520			P
7782-49-2	Selenium	1.1	U		P
7440-22-4	Silver	0.27	U		P
7440-23-5	Sodium	274	U		P
7440-28-0	Thallium	0.82	U		P
7440-62-2	Vanadium	84.2			P
7440-66-6	Zinc	53.9			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB005 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-09

Level (low/med): LOW Date Received: 07/02/08

% 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	32300			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	10.4			P
7440-39-3	Barium	114			P
7440-41-7	Beryllium	0.79	B		P
7440-43-9	Cadmium	0.85	B		P
7440-70-2	Calcium	6700			P
7440-47-3	Chromium	46.4			P
7440-48-4	Cobalt	7.6			P
7440-50-8	Copper	113			P
7439-89-6	Iron	44400			P
7439-92-1	Lead	78.4			P
7439-95-4	Magnesium	4480			P
7439-96-5	Manganese	329			P
7439-97-6	Mercury	0.088			AV
7440-02-0	Nickel	18.4			P
7440-09-7	Potassium	1510			P
7782-49-2	Selenium	0.97	U		P
7440-22-4	Silver	0.24	U		P
7440-23-5	Sodium	241	U		P
7440-28-0	Thallium	0.72	U		P
7440-62-2	Vanadium	77.6			P
7440-66-6	Zinc	540			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASBDUP001 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-10

Level (low/med): LOW Date Received: 07/02/08

% Solids: 74.0

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	11.0			P
7440-39-3	Barium	90.9			P
7440-41-7	Beryllium	0.80	B		P
7440-43-9	Cadmium	0.52	B		P
7440-70-2	Calcium	9020			P
7440-47-3	Chromium	59.7			P
7440-48-4	Cobalt	6.3			P
7440-50-8	Copper	68.1			P
7439-89-6	Iron	45300			P
7439-92-1	Lead	95.7			P
7439-95-4	Magnesium	5030			P
7439-96-5	Manganese	244			P
7439-97-6	Mercury	0.081			AV
7440-02-0	Nickel	13.3			P
7440-09-7	Potassium	1520			P
7782-49-2	Selenium	1.0	B		P
7440-22-4	Silver	0.26	U		P
7440-23-5	Sodium	255	U		P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	83.5			P
7440-66-6	Zinc	375			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB003 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-11

Level (low/med): LOW Date Received: 07/02/08

% 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	26100			P
7440-36-0	Antimony	1.1	U	N	P
7440-38-2	Arsenic	4.9			P
7440-39-3	Barium	203			P
7440-41-7	Beryllium	0.90	B		P
7440-43-9	Cadmium	0.47	B		P
7440-70-2	Calcium	15900			P
7440-47-3	Chromium	44.7			P
7440-48-4	Cobalt	9.9			P
7440-50-8	Copper	245			P
7439-89-6	Iron	49500			P
7439-92-1	Lead	170			P
7439-95-4	Magnesium	7190			P
7439-96-5	Manganese	397			P
7439-97-6	Mercury	0.097			AV
7440-02-0	Nickel	20.1			P
7440-09-7	Potassium	1540			P
7782-49-2	Selenium	0.92	U		P
7440-22-4	Silver	0.23	U		P
7440-23-5	Sodium	230	U		P
7440-28-0	Thallium	0.69	U		P
7440-62-2	Vanadium	66.5			P
7440-66-6	Zinc	313			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB006 (0-1)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Lab Sample ID: 0807029-13

Level (low/med): LOW Date Received: 07/02/08

% Solids: 81.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	37000			P
7440-36-0	Antimony	1.2	U	N	P
7440-38-2	Arsenic	3.6			P
7440-39-3	Barium	54.1			P
7440-41-7	Beryllium	0.76	B		P
7440-43-9	Cadmium	0.24	U		P
7440-70-2	Calcium	1120	B		P
7440-47-3	Chromium	30.7			P
7440-48-4	Cobalt	5.3			P
7440-50-8	Copper	21.1			P
7439-89-6	Iron	46900			P
7439-92-1	Lead	18.0			P
7439-95-4	Magnesium	1560			P
7439-96-5	Manganese	226			P
7439-97-6	Mercury	0.067			AV
7440-02-0	Nickel	12.4			P
7440-09-7	Potassium	1250			P
7782-49-2	Selenium	0.95	U		P
7440-22-4	Silver	0.24	U		P
7440-23-5	Sodium	237	U		P
7440-28-0	Thallium	0.71	U		P
7440-62-2	Vanadium	88.3			P
7440-66-6	Zinc	43.6			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ASB006 (5-6)

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOLID Lab Sample ID: 0807029-14

Level (low/med): LOW Date Received: 07/02/08

% 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	31900			P
7440-36-0	Antimony	1.1	U	N	P
7440-38-2	Arsenic	2.3			P
7440-39-3	Barium	49.8			P
7440-41-7	Beryllium	0.68	B		P
7440-43-9	Cadmium	0.23	U		P
7440-70-2	Calcium	225	U		P
7440-47-3	Chromium	24.2			P
7440-48-4	Cobalt	3.9			P
7440-50-8	Copper	14.6			P
7439-89-6	Iron	33400			P
7439-92-1	Lead	10.9			P
7439-95-4	Magnesium	1210			P
7439-96-5	Manganese	135			P
7439-97-6	Mercury	0.029	B		AV
7440-02-0	Nickel	11.2			P
7440-09-7	Potassium	1350			P
7782-49-2	Selenium	0.90	U		P
7440-22-4	Silver	0.23	U		P
7440-23-5	Sodium	225	U		P
7440-28-0	Thallium	0.68	U		P
7440-62-2	Vanadium	64.0			P
7440-66-6	Zinc	35.8			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.: 0807029

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	10672.42	106.7	10000.0	10952.75	109.5	10139.87	101.4	P
Antimony	1000.0	966.71	96.7	1000.0	992.94	99.3	936.89	93.7	P
Arsenic	1000.0	1010.39	101.0	1000.0	1024.65	102.5	973.68	97.4	P
Barium	1000.0	991.54	99.2	1000.0	1013.52	101.4	934.36	93.4	P
Beryllium	1000.0	1018.33	101.8	1000.0	1078.54	107.9	1059.06	105.9	P
Cadmium	1000.0	1040.23	104.0	1000.0	1052.01	105.2	1034.90	103.5	P
Calcium	1000.0	967.68	96.8	1000.0	1068.83	106.9	1073.06	107.3	P
Chromium	1000.0	983.85	98.4	1000.0	1024.91	102.5	998.16	99.8	P
Cobalt	1000.0	978.72	97.9	1000.0	1016.11	101.6	993.53	99.4	P
Copper	1000.0	994.92	99.5	1000.0	1014.96	101.5	936.43	93.6	P
Iron	10000.0	10059.84	100.6	10000.0	10464.10	104.6	10160.81	101.6	P
Lead	1000.0	991.66	99.2	1000.0	1025.18	102.5	984.65	98.5	P
Magnesium	1000.0	1002.24	100.2	1000.0	1032.60	103.3	993.22	99.3	P
Manganese	1000.0	1023.24	102.3	1000.0	1053.47	105.3	1026.50	102.6	P
Mercury	4.0	4.29	107.2	4.0	3.92	98.0	3.90	97.5	AV
Nickel	1000.0	999.28	99.9	1000.0	1020.08	102.0	988.88	98.9	P
Potassium	10000.0	10392.05	103.9	10000.0	10587.84	105.9	9586.83	95.9	P
Selenium	1000.0	1000.92	100.1	1000.0	1009.59	101.0	955.49	95.5	P
Silver	500.0	479.77	96.0	500.0	498.98	99.8	477.72	95.5	P
Sodium	11000.0	10785.53	98.1	11000.0	11109.06	101.0	10338.36	94.0	P
Thallium	1000.0	962.41	96.2	1000.0	1018.97	101.9	938.13	93.8	P
Vanadium	1000.0	981.36	98.1	1000.0	1008.67	100.9	971.89	97.2	P
Zinc	1000.0	998.30	99.8	1000.0	1041.47	104.1	1050.44	105.0	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.: 0807029

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	10283.32	102.8	10292.00	102.9	P
Antimony				1000.0	953.44	95.3	951.17	95.1	P
Arsenic				1000.0	986.91	98.7	994.76	99.5	P
Barium				1000.0	957.33	95.7	954.99	95.5	P
Beryllium				1000.0	1049.40	104.9	1084.67	108.5	P
Cadmium				1000.0	1044.04	104.4	1072.81	107.3	P
Calcium				1000.0	1025.48	102.5	1085.97	108.6	P
Chromium				1000.0	1004.58	100.5	1031.28	103.1	P
Cobalt				1000.0	987.58	98.8	1019.25	101.9	P
Copper				1000.0	953.91	95.4	949.20	94.9	P
Iron				10000.0	10216.44	102.2	10482.10	104.8	P
Lead				1000.0	996.73	99.7	1018.58	101.9	P
Magnesium				1000.0	1000.36	100.0	1013.66	101.4	P
Manganese				1000.0	1029.94	103.0	1054.98	105.5	P
Mercury				2.0	2.04	102.0	2.05	102.5	AV
Nickel				1000.0	1005.41	100.5	1028.02	102.8	P
Potassium				10000.0	9818.07	98.2	9500.92	95.0	P
Selenium				1000.0	959.03	95.9	965.92	96.6	P
Silver				500.0	479.02	95.8	486.61	97.3	P
Sodium				11000.0	10388.35	94.4	10349.32	94.1	P
Thallium				1000.0	956.41	95.6	971.27	97.1	P
Vanadium				1000.0	981.52	98.2	998.62	99.9	P
Zinc				1000.0	1043.89	104.4	1096.02	109.6	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.: 0807029

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	115.85	96.5		
Arsenic				20.0	21.83	109.2		
Barium								
Beryllium				10.0	10.20	102.0		
Cadmium				10.0	10.08	100.8		
Calcium								
Chromium				20.0	19.46	97.3		
Cobalt				100.0	94.33	94.3		
Copper				50.0	48.74	97.5		
Iron								
Lead				6.0	6.75	112.5		
Magnesium								
Manganese				30.0	29.67	98.9		
Nickel				80.0	77.19	96.5		
Potassium								
Selenium				10.0	8.59	85.9		
Silver				20.0	19.59	98.0		
Sodium								
Thallium				20.0	18.93	94.6		
Vanadium				100.0	96.69	96.7		
Zinc				40.0	38.41	96.0		

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.: 0807029

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	1.6	B	0.581	B	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
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	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	4.0	U	4.0	U	4.0	U	4.0	U	0.800	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.: 0807029

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							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
Mercury			0.080	U					0.013	U	AV
Nickel			5.0	U							P
Potassium			1000.0	U							P
Selenium			4.0	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.: 0807029

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	513677	513379.4	102.7			
Antimony	0	600	-2	596.2	99.4			
Arsenic	0	100	3	103.5	103.5			
Barium	0	500	2	539.6	107.9			
Beryllium	0	500	0	490.1	98.0			
Cadmium	0	1000	3	944.2	94.4			
Calcium	500000	500000	449018	451854.0	90.4			
Chromium	0	500	1	472.0	94.4			
Cobalt	0	500	-1	455.3	91.1			
Copper	0	500	0	543.6	108.7			
Iron	200000	200000	193989	193732.4	96.9			
Lead	0	50	3	50.6	101.2			
Magnesium	500000	500000	511247	507650.4	101.5			
Manganese	0	500	-1	486.2	97.2			
Nickel	0	1000	-2	918.3	91.8			
Potassium	0	0	49	49.2				
Selenium	0	50	-12	40.0	80.0			
Silver	0	200	0	207.9	104.0			
Sodium	0	0	174	125.4				
Thallium	0	100	-6	85.8	85.8			
Vanadium	0	500	1	477.3	95.5			
Zinc	0	1000	-14	872.2	87.2			

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

ASB009 (0-1)S

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 74.0

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		36811.5700		37122.7900		529.94	-58.7		P
Antimony	75 - 125	5.9220		1.3380	U	66.24	8.9	N	P
Arsenic	75 - 125	67.1651		6.4278		66.24	91.7		P
Barium	75 - 125	611.8918		74.3750		529.94	101.4		P
Beryllium	75 - 125	14.5582		0.7941	B	13.25	103.9		P
Cadmium	75 - 125	34.8713		0.2676	U	33.12	105.3		P
Calcium	75 - 125	3428.0870		1886.9980		1324.85	116.3		P
Chromium	75 - 125	97.5411		39.1893		52.99	110.1		P
Cobalt	75 - 125	135.1843		5.3908		132.49	98.0		P
Copper	75 - 125	150.8484		90.5376		66.24	91.0		P
Iron		49093.8200		48015.0700		264.97	407.1		P
Lead	75 - 125	96.7414		28.9853		66.24	102.3		P
Magnesium	75 - 125	3058.9380		1712.4030		1324.85	101.6		P
Manganese	75 - 125	389.0818		272.1086		132.49	88.3		P
Mercury	75 - 125	0.4930		0.0935		0.39	102.4		AV
Nickel	75 - 125	144.9266		12.6839		132.49	99.8		P
Potassium	75 - 125	2886.8580		1540.4840		1324.85	101.6		P
Selenium	75 - 125	58.7861		1.0704	U	66.24	88.7		P
Silver	75 - 125	66.0406		0.2676	U	66.24	99.7		P
Sodium	75 - 125	1714.7750		545.7051	B	1324.85	88.2		P
Thallium	75 - 125	62.6177		0.8028	U	66.24	94.5		P
Vanadium	75 - 125	217.4219		86.4628		132.49	98.8		P
Zinc	75 - 125	259.3053		122.5517		132.49	103.2		P

Comments:

USEPA - CLP

5A

SPIKE SAMPLE RECOVERY

SAMPLE NO.

ASB009 (0-1)SD

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 74.0

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		41345.6000		37122.7900		514.80	820.3		P
Antimony	75 - 125	4.9781		1.3380	U	64.35	7.7	N	P
Arsenic	75 - 125	66.1715		6.4278		64.35	92.8		P
Barium	75 - 125	594.0868		74.3750		514.80	101.0		P
Beryllium	75 - 125	14.2089		0.7941	B	12.87	104.2		P
Cadmium	75 - 125	34.1916		0.2676	U	32.18	106.3		P
Calcium	75 - 125	3488.0230		1886.9980		1287.00	124.4		P
Chromium	75 - 125	93.7080		39.1893		51.48	105.9		P
Cobalt	75 - 125	131.9298		5.3908		128.70	98.3		P
Copper	75 - 125	143.0680		90.5376		64.35	81.6		P
Iron		51716.3100		48015.0700		257.40	1437.9		P
Lead	75 - 125	93.7162		28.9853		64.35	100.6		P
Magnesium	75 - 125	3165.6580		1712.4030		1287.00	112.9		P
Manganese	75 - 125	402.0169		272.1086		128.70	100.9		P
Mercury	75 - 125	0.5346		0.0935		0.41	107.6		AV
Nickel	75 - 125	142.7158		12.6839		128.70	101.0		P
Potassium	75 - 125	2912.7750		1540.4840		1287.00	106.6		P
Selenium	75 - 125	58.2979		1.0704	U	64.35	90.6		P
Silver	75 - 125	64.1850		0.2676	U	64.35	99.7		P
Sodium	75 - 125	1705.1970		545.7051	B	1287.00	90.1		P
Thallium	75 - 125	61.2563		0.8028	U	64.35	95.2		P
Vanadium	75 - 125	219.7274		86.4628		128.70	103.5		P
Zinc	75 - 125	239.9712		122.5517		128.70	91.2		P

Comments:

USEPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.

ASB009 (0-1)A

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS _____ SDG No.: 0807029

Matrix (soil/water): SOIL 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		141057.10		138727.84		2000.0	116.5		P
Antimony		236.10		5.00	U	250.0	94.4		P
Arsenic		280.20		24.02		250.0	102.5		P
Barium		2363.21		277.94		2000.0	104.3		P
Beryllium		57.36		2.97	B	50.0	108.8		P
Cadmium		135.67		1.00	U	125.0	108.5		P
Calcium		13129.57		7051.71		5000.0	121.6		P
Chromium		358.94		146.45		200.0	106.2		P
Cobalt		532.57		20.15		500.0	102.5		P
Copper		597.04		338.34		250.0	103.5		P
Iron		180255.00		179432.32		1000.0	82.3		P
Lead		370.89		108.32		250.0	105.0		P
Magnesium		11572.85		6399.25		5000.0	103.5		P
Manganese		1552.29		1016.87		500.0	107.1		P
Nickel		570.58		47.40		500.0	104.6		P
Potassium		11333.73		5756.79		5000.0	111.5		P
Selenium		241.56		4.00	U	250.0	96.6		P
Silver		257.18		1.00	U	250.0	102.9		P
Sodium		6879.74		2039.30	B	5000.0	96.8		P
Thallium		246.33		3.00	U	250.0	98.5		P
Vanadium		837.07		323.11		500.0	102.8		P
Zinc		1000.85		457.98		500.0	108.6		P

Comments: _____

6

DUPLICATES

SAMPLE NO.

ASB009 (0-1)SD

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 74.0 % Solids for Duplicate: 74.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		36811.5600		41345.6000		11.6		P
Antimony		5.9220		4.9781		17.3		P
Arsenic		67.1651		66.1715		1.5		P
Barium		611.8918		594.0868		3.0		P
Beryllium		14.5582		14.2089		2.4		P
Cadmium		34.8713		34.1916		2.0		P
Calcium		3428.0870		3488.0230		1.7		P
Chromium		97.5411		93.7080		4.0		P
Cobalt		135.1843		131.9298		2.4		P
Copper		150.8484		143.0680		5.3		P
Iron		49093.8200		51716.3100		5.2		P
Lead		96.7414		93.7162		3.2		P
Magnesium		3058.9380		3165.6580		3.4		P
Manganese		389.0818		402.0169		3.3		P
Mercury		0.4930		0.5346		8.1		AV
Nickel		144.9266		142.7158		1.5		P
Potassium		2886.8570		2912.7750		0.9		P
Selenium		58.7861		58.2979		0.8		P
Silver		66.0406		64.1850		2.8		P
Sodium		1714.7750		1705.1970		0.6		P
Thallium		62.6177		61.2563		2.2		P
Vanadium		217.4219		219.7274		1.1		P
Zinc		259.3053		239.9712		7.7		P

7

LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

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	443.6		320.0	480.0	110.9
Antimony				50.0	49.3		40.0	60.0	98.6
Arsenic				50.0	51.0		40.0	60.0	102.0
Barium				400.0	396.8		320.0	480.0	99.2
Beryllium				10.0	10.6		8.0	12.0	106.0
Cadmium				25.0	26.7		20.0	30.0	106.8
Calcium				1000.0	1061.4		800.0	1200.0	106.1
Chromium				40.0	40.8		32.0	48.0	102.0
Cobalt				100.0	98.7		80.0	120.0	98.7
Copper				50.0	48.3		40.0	60.0	96.6
Iron				200.0	215.7		160.0	240.0	107.8
Lead				50.0	51.6		40.0	60.0	103.2
Magnesium				1000.0	1010.5		800.0	1200.0	101.0
Manganese				100.0	103.5		80.0	120.0	103.5
Mercury				0.33	0.34		0.3	0.4	103.0
Nickel				100.0	100.0		80.0	120.0	100.0
Potassium				1000.0	1057.4		800.0	1200.0	105.7
Selenium				50.0	47.8		40.0	60.0	95.6
Silver				50.0	49.9		40.0	60.0	99.8
Sodium				1000.0	981.7	B	800.0	1200.0	98.2
Thallium				50.0	48.1		40.0	60.0	96.2
Vanadium				100.0	98.7		80.0	120.0	98.7
Zinc				100.0	104.9		80.0	120.0	104.9

7

LABORATORY CONTROL SAMPLE

Lab Name: Empirical Laboratories Contract: Arcadis

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0807029

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	0.34		0.3 0.4	103.0

ORGANIC CASE NARRATIVE - PCBs
Arcadis - Radford
Workorder: 0807029

Date Sampled	Date Received	Lab ID	Client ID
30-Jun-2008	02-Jul-2008	0807029-01	ASB010 (0-1)
30-Jun-2008	02-Jul-2008	0807029-02	ASB010 (5-6)
30-Jun-2008	02-Jul-2008	0807029-03	ASB009 (0-1)
30-Jun-2008	02-Jul-2008	0807029-04	ASB009 (5-6)
30-Jun-2008	02-Jul-2008	0807029-05	ASB008 (0-1)
30-Jun-2008	02-Jul-2008	0807029-06	ASB008 (5-6)
30-Jun-2008	02-Jul-2008	0807029-07	ASB007 (0-1)
30-Jun-2008	02-Jul-2008	0807029-08	ASB007 (5-6)
30-Jun-2008	02-Jul-2008	0807029-09	ASB005 (0-1)
30-Jun-2008	02-Jul-2008	0807029-10	ASBDUP001 (0-1)
30-Jun-2008	02-Jul-2008	0807029-11	ASB003 (0-1)
30-Jun-2008	02-Jul-2008	0807029-12	EB-2 (063008)
30-Jun-2008	02-Jul-2008	0807029-13	ASB006 (0-1)
30-Jun-2008	02-Jul-2008	0807029-14	ASB006 (5-6)

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: Analyses of the samples were completed using full calibration for 1016/1260. Per the method, single point calibration was performed for PCB-1242 and PCB-1254 to allow quantitation in the samples.
- Calibration Criteria: All method calibration criteria were met with the exception that the surrogate DCB exceeded with a positive bias in the ending ZB MR-2. Surrogate recoveries were evaluated and determined not to have been biased into control by the exceedence.
- Blank Results: No target analytes were detected.
- Surrogate Recoveries: All recoveries were within limits.
- LCS Results: Recovery of PCB-1016 exceeded the limit of 120% at 123%. Recovery of PCB-1260 was within limits.
- MS/MSD results: Recoveries of PCB-1016 and PCB-1260 exceeded the respective limits of 120% and 125% at (96%)/123% and (92%)/126% with relative percent differences of 24 and 31.
- Dilutions: All samples analyzed without dilution. Samples ASB003 (0-1) and ASB005 (0-1) were analyzed at dilutions due to target analyte concentrations.

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.0031.DF000 /RAAP031 (AOCA)

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation SG, MC /ARCADIS

807029

	Sample ID/Location	Matrix	Date Sampled	Time	Lab ID	SVOCs (8270)	PCBs (8082)	Metals (6010)				Remarks	Total
01	ASB010 (0-1)	SO	6/30/08	15:50		X	X	X					1
-02	ASB010 (5-6)			15:50		X	X	X					1
-03	ASB009 (0-1)			16:05		X	X	X				⊛MS/MSD	2
-04	ASB009 (5-6)			16:10		X	X	X					2
-05	ASB008 (0-1)			16:25		X	X	X					1
-06	ASB008 (5-6)			16:30		X	X	X					2
-07	ASB007 (0-1)			16:35		X	X	X					1
-08	ASB007 (5-6)			16:40		X	X	X					2
-09	ASB005 (0-1)			17:15		X	X	X					1
-10	ASBDUP001 (0-1)			17:15		X	X	X					1
-11	ASB003 (0-1)	↓	↓	17:30		X	X	~~X~~ X					1
-12	EB-2 (063008)	L	6/30/08	17:45		X	X	[redacted] SG					4
-13	ASB006-(0-1)										*		
-14	ASB006 (5-6)										*		
													19

Sample Matrix: L = Liquid; S = Solid; A = Air So = Soil

* Samples ASB006(0-1) & ASB006(5-6) rec'd + not on COC. Added to WO. MS

Total No. of Bottles/Containers

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 7/1/08	Time 16:30	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical	Date 7/2/08	Time 09:00	Yes No N/A	

Special Instructions/Remarks: (1) low volume for samples (2) please contact with any questions

2.8C

Delivery Method: ☐ In Person ☒ Common Carrier FedEx SPECIFY ☐ Lab Courier ☐ Other SPECIFY

AG 05-12/01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0807029 COC ID(s): 070108-1

Client Arcadis Project Radford

Sample Custodian WS Today's Date 7/2/08

Date/Time Samples Received 7/2/08 09:00

Airbill Number Fedex

Cooler Opened: Date 7/2/08

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): 7/1/08

Type of coolant used Ice

Coolant condition : Melted _____ Partially melted/frozen ✓

Frozen _____

# of Coolers 1 Temp. of Coolers 2.8°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
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB010 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 027F2701

% Moisture: 23 decanted: (Y/N) N Date Sampled: 06/30/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/09/08 22:08

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	15	J(1)
12672-29-6	PCB-1248	5.4	22		U
11097-69-1	PCB-1254	5.4	22	11	J(1)
11096-82-5	PCB-1260	5.4	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.

ASB010 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 028F2801

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 15:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/09/08 22:27

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	16	J(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.

ASB009 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 029F2901

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 16:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/09/08 22:45

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	200	(1)
11096-82-5	PCB-1260	5.6	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.

ASB009 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 032F3201

% Moisture: 23 decanted: (Y/N) N Date Sampled: 06/30/08 16:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/09/08 23:41

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		U
11096-82-5	PCB-1260	5.4	22		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB008 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 037F3701

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 16:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 01:14

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	5.7	23		U
11104-28-2	PCB-1221	5.7	23		U
11141-16-5	PCB-1232	5.7	23		U
53469-21-9	PCB-1242	5.7	23		U
12672-29-6	PCB-1248	5.7	23		U
11097-69-1	PCB-1254	5.7	23		U
11096-82-5	PCB-1260	5.7	23		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB008 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 038F3801

% Moisture: 32 decanted: (Y/N) N Date Sampled: 06/30/08 16:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 01:32

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	6.1	24		U
11104-28-2	PCB-1221	6.1	24		U
11141-16-5	PCB-1232	6.1	24		U
53469-21-9	PCB-1242	6.1	24		U
12672-29-6	PCB-1248	6.1	24		U
11097-69-1	PCB-1254	6.1	24		U
11096-82-5	PCB-1260	6.1	24		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB007 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 039F3901

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 16:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 01:51

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	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	96	(1)
11096-82-5	PCB-1260	4.8	19		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.

ASB007 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 040F4001

% Moisture: 33 decanted: (Y/N) N Date Sampled: 06/30/08 16:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 02:09

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	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.

ASB005 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 041F4101

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 02:28

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	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	1200	E(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.

ASB005 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-09DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 042F4201

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 02:46

Injection Volume: 2.0(uL) Dilution Factor: 5.0

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	27	110		UD
11104-28-2	PCB-1221	27	110		UD
11141-16-5	PCB-1232	27	110		UD
53469-21-9	PCB-1242	27	110		UD
12672-29-6	PCB-1248	27	110		UD
11097-69-1	PCB-1254	27	110	1200	D(1)
11096-82-5	PCB-1260	27	110		UD

(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.

ASBDUP001 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 043F4301

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/30/08 17:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 03:05

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	340	(1)
11096-82-5	PCB-1260	5.6	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.

ASB003 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 044F4401

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 17:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 03:23

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	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	2200	E(1)
11096-82-5	PCB-1260	4.8	19		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.

ASB003 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-11DL

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 045F4501

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/30/08 17:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 03:42

Injection Volume: 2.0(uL) Dilution Factor: 5.0

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	24	95		UD
11104-28-2	PCB-1221	24	95		UD
11141-16-5	PCB-1232	24	95		UD
53469-21-9	PCB-1242	24	95		UD
12672-29-6	PCB-1248	24	95		UD
11097-69-1	PCB-1254	24	95	2400	D(1)
11096-82-5	PCB-1260	24	95		UD

(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.

EB-2 (063008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) WATER Lab Sample ID: 0807029-12

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 022F2201

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 06/30/08 17:45

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/07/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 07/09/08 20:36

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/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
12674-11-2	PCB-1016	0.12	0.46		U
11104-28-2	PCB-1221	0.12	0.46		U
11141-16-5	PCB-1232	0.12	0.46		U
53469-21-9	PCB-1242	0.12	0.46		U
12672-29-6	PCB-1248	0.12	0.46		U
11097-69-1	PCB-1254	0.12	0.46		U
11096-82-5	PCB-1260	0.12	0.46		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

ASB006 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-13

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 046F4601

% Moisture: 19 decanted: (Y/N) N Date Sampled: 06/30/08 17:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 04:00

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	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.

ASB006 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: 0807029-14

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 047F4701

% Moisture: 17 decanted: (Y/N) N Date Sampled: 06/30/08 17:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/10/08 04:19

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 2
SOIL PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

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	PS1BLK0703	78	87	96	113			0
02	PS1BLK0703LC	83	90	99	118			0
03	ASB010 (0-1)	74	84	88	105			0
04	ASB010 (5-6)	55	64	74	88			0
05	ASB009 (0-1)	80	89	94	107			0
06	ASB009 (0-1)	66	72	79	95			0
07	ASB009 (0-1)	81	87	90	106			0
08	ASB009 (5-6)	71	80	83	99			0
09	ASB008 (0-1)	81	90	95	112			0
10	ASB008 (5-6)	78	88	94	108			0
11	ASB007 (0-1)	76	85	92	111			0
12	ASB007 (5-6)	38	42	44	55			0
13	ASB005 (0-1)	80	87	96	108			0
14	ASB005 (0-1)	76D	85D	89D	119D			0
15	ASBDUP001 (0	70	69	81	98			0
16	ASB003 (0-1)	62	81	82	93			0
17	ASB003 (0-1)	65D	86D	87D	125D			0
18	ASB006 (0-1)	73	81	84	101			0
19	ASB006 (5-6)	55	61	71	86			0
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.: ARC.P07029

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	PW1BLK0707	72	81	78	95			0
02	PW1BLK0707LC	80	86	86	104			0
03	PW1BLK0707LC	77	84	96	116			0
04	EB-2 (063008	78	92	95	119			0
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 MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix Spike - Client Sample No.: ASB009 (0-1) Lab Sample ID: 0807029-03

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
PCB-1016	225.2	0.0000	217.4	96	45-120
PCB-1260	225.2	0.0000	208.0	92	40-125

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	225.2	276.8	123*	24	50	45-120
PCB-1260	225.2	283.7	126*	31	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: 2 out of 4 outside limits

COMMENTS: _____

FORM 3
SOIL PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix Spike - Client Sample No.: PS1BLK0703

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PCB-1016	166.7	0.0000	204.6	123*	45-120
PCB-1260	166.7	0.0000	180.5	108	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: 1 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.: ARC.P07029

Matrix Spike - Client Sample No.: PW1BLK0707

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
PCB-1016	5.000	0.0000	6.076	122	30-140
PCB-1260	5.000	0.0000	5.543	111	40-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	5.000	5.888	118	3	30	30-140
PCB-1260	5.000	5.149	103	7	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.

PW1BLK0707

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Lab Sample ID: PW1BLK0707 Lab File ID: 019F1901

Matrix (soil/water) WATER Extraction: (SepF/Cont/Sonc/Soxh) SEPF

Sulfur Cleanup (Y/N) Y Date Extracted: 07/07/08

Date Analyzed (1): 07/09/08 Date Analyzed (2): 07/09/08

Time Analyzed (1): 1940 Time Analyzed (2): 1940

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	PW1BLK0707LC	PW1BLK0707LCS	07/09/08	07/09/08
02	PW1BLK0707LC	PW1BLK0707LCSD	07/09/08	07/09/08
03	EB-2 (063008	0807029-12	07/09/08	07/09/08
04				
05				
06				
07				
08				
09				
10				
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26				

COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW1BLK0707

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) WATER Lab Sample ID: PW1BLK0707

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 019F1901

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:07/07/08

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 07/09/08 19:40

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/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 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PS1BLK0703

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Lab Sample ID: PS1BLK0703 Lab File ID: 025F2501

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SOXH

Sulfur Cleanup (Y/N) Y Date Extracted: 07/03/08

Date Analyzed (1): 07/09/08 Date Analyzed (2): 07/09/08

Time Analyzed (1): 2131 Time Analyzed (2): 2131

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	PS1BLK0703LC	PS1BLK0703LCS	07/09/08	07/09/08
02	ASB010 (0-1)	0807029-01	07/09/08	07/09/08
03	ASB010 (5-6)	0807029-02	07/09/08	07/09/08
04	ASB009 (0-1)	0807029-03	07/09/08	07/09/08
05	ASB009 (0-1)	0807029-03MS	07/09/08	07/09/08
06	ASB009 (0-1)	0807029-03MSD	07/09/08	07/09/08
07	ASB009 (5-6)	0807029-04	07/09/08	07/09/08
08	ASB008 (0-1)	0807029-05	07/10/08	07/10/08
09	ASB008 (5-6)	0807029-06	07/10/08	07/10/08
10	ASB007 (0-1)	0807029-07	07/10/08	07/10/08
11	ASB007 (5-6)	0807029-08	07/10/08	07/10/08
12	ASB005 (0-1)	0807029-09	07/10/08	07/10/08
13	ASB005 (0-1)	0807029-09DL	07/10/08	07/10/08
14	ASBDUP001 (0	0807029-10	07/10/08	07/10/08
15	ASB003 (0-1)	0807029-11	07/10/08	07/10/08
16	ASB003 (0-1)	0807029-11DL	07/10/08	07/10/08
17	ASB006 (0-1)	0807029-13	07/10/08	07/10/08
18	ASB006 (5-6)	0807029-14	07/10/08	07/10/08
19				
20				
21				
22				
23				
24				
25				
26				

COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PS1BLK0703

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P07029

Matrix: (soil/water) SOIL Lab Sample ID: PS1BLK0703

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 025F2501

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:07/03/08

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 07/09/08 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	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
Arcadis - Radford
Workorder: 0812363

Date Sampled	Date Received	Lab ID	Client ID
12/30/2008	12/31/2008	0812363-01	A31-SB003A (0-1)
12/30/2008	12/31/2008	0812363-02	A31-SB003A (5-6)
12/30/2008	12/31/2008	0812363-03	A31-SB004A (0-1)
12/30/2008	12/31/2008	0812363-04	A31-SB004A (5-6)
12/30/2008	12/31/2008	0812363-05	A31-SB011 (0-1)
12/30/2008	12/31/2008	0812363-06	A31-SB012 (1-2)
12/30/2008	12/31/2008	0812363-07	A31-SB012 (5-6)
12/30/2008	12/31/2008	0812363-08	A31-SB013 (0-1)
12/30/2008	12/31/2008	0812363-09	A31-SB013 (5-6)
12/30/2008	12/31/2008	0812363-10	A31-SB014 (0-1)
12/30/2008	12/31/2008	0812363-11	A31-SB014 (5-6)
12/30/2008	12/31/2008	0812363-12	A31-SB015 (2-3)
12/30/2008	12/31/2008	0812363-13	A31-SB015 (5-6)
12/30/2008	12/31/2008	0812363-14	A31-SB016 (0-1)
12/30/2008	12/31/2008	0812363-15	A31-SB016 (5-6)
12/30/2008	12/31/2008	0812363-16	A31-SB017 (0-1)
12/30/2008	12/31/2008	0812363-17	A31-SB017 (5-6)
12/30/2008	12/31/2008	0812363-18	A31-SB018 (0-1)
12/30/2008	12/31/2008	0812363-19	A31-SB018 (5-6)
12/30/2008	12/31/2008	0812363-20	A31-SB019 (0-1)
12/30/2008	12/31/2008	0812363-21	A31-SB019 (5-6)
12/30/2008	12/31/2008	0812363-22	A31-SBDUP002 (0-1)
12/30/2008	12/31/2008	0812363-23	A31-EB001 (123008)

Semivolatiles 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:

- Target Analytes: Samples were analyzed for 2,4-dinitrotoluene and 2,6-dinitrotoluene.
- DFTPP Tuning: All method tuning criteria were met. Analysis of sample A31-SB017 (0-1) was started 12 hours 2 minutes after the associated tuning standard.
- Calibration Criteria: All method calibration criteria were met. Radford criteria were exceeded in the ICV for 2,4-dinitrotoluene which exceeded with a negative bias of 25%.
- Blank Results: No target analytes were detected in the method blanks.
- Surrogate Recoveries: One or more surrogate recoveries were below the limits in samples A31-SB015 (5-6), A31-SB017 (0-1), A31-SB018 (0-1), A31-SB018 (5-6) and A31-SB019 (0-1). This is attributed to sample matrix. See form 2.
- SBLK0102BS1LCS results: Recovery of 2,4-dinitrotoluene was below the limit of 50% at 49%. Recovery of 2,6-dinitrotoluene was within limits.
- SBLK0102BW1LCS/LCSD: All recoveries and relative percent differences were within limits.
- SBLK0105BS1LCS/LCSD: All recoveries and relative percent differences were within limits.
- MS/MSD Results: All recoveries and relative percent differences were within limits.

Analyses for the MS/MSD were started 12 hours 43 minutes/13 hours 23 minutes after the associated tuning standard.

- Internal Standard Area Counts: All area counts were within limits.
- Dilutions: Not applicable.

PCB 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:

- Calibration Criteria: All method calibration criteria were met. The surrogate percent differences exceeded 15% in some of the CCVs with positive or negative biases less than 20%. Surrogate recoveries were evaluated and determined not to have been biased into control.
- Blank Results: No target analytes were detected in the method blanks.
- Surrogate Recoveries: All recoveries were within limits.
- LCS(/LCSD) Results: All recoveries (and relative percent differences) 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.

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 2

Project Number/Name RAAP031 (ADCA) / GP08RAAP0031

Project Location Radford, VA

Laboratory Empirical

Project Manager Diane Wisbeck 410.987.6032

Sampler(s)/Affiliation SG, AM (ARCADIS)

08123 63

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	SVOCs (DNT only) method 8270 4oz soil jar	PCBs method 8082 4oz soil jar	none	none				Remarks	Total
-01	A31-SB003A (0-1)	So	12/30/08 8:40		X	X							1
-02	A31-SB003A (5-6)	So	12/30/08 11:00		X	X							1
-03	A31-SB004A (0-1)	So	12/30/08 8:50		X	X						⊛ 5DAY TAT ⊛	1
-04	A31-SB004A (5-6)	So	12/30/08 10:10		X	X							1
-05	A31-SB011 (0-1)	So	12/30/08 9:00			X							1
-06	A31-SB012 (0-2)	So	12/30/08 11:45		X	X						sample depth (1-2)	1
-07	A31-SB012 (5-6)	So	12/30/08 11:50		X	X							1
-08	A31-SB013 (0-1)	So	12/30/08 9:05		X	X							1
-09	A31-SB013 (5-6)	So	12/30/08 12:15		X	X							1
-10	A31-SB014 (0-1)	So	12/30/08 8:15		X	X						~~⊛ 5DAY TAT ⊛~~ SG	1
-11	A31-SB014 (5-6)	So	12/30/08 10:00		X	X						⊛ 5 DAY TAT ⊛	1
-12	A31-SB015 (2-3)	So	12/30/08 11:25		X	X						⊛ MS/MSD	2
-13	A31-SB015 (5-6)	So	12/30/08 11:35		X	X							1
-14	A31-SB016 (0-1)	So	12/30/08 9:45		X	X							1
-15	A31-SB016 (5-6)	So	12/30/08 12:30		X	X							1

Sample Matrix: L = Liquid; S = Solid; A = Air So = Soil

Total No. of Bottles/Containers

Relinquished by: Sandra Grabowski	Organization: ARCADIS	Date 12/30/08	Time 1700	Seal Intact?	
Received by:	Organization:	Date / /	Time	Yes No N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?	
Received by:	Organization: Empirical Labs	Date 12/31/08	Time 0900	(Yes) No N/A	

Special Instructions/Remarks: ① RUSH TAT (1 week) for sample A31-SB004A(0-1) and A31-SB014(5-6) as marked; all other Standard TAT ② please contact with any questions

Delivery Method: ☐ In Person ☒ Common Carrier FedEx ☐ Lab Courier ☐ Other

SPECIFY SPECIFY

AG 05 12/01

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 2 of 2

Project Number/Name GPORAAP0031 / RAAP031 (AOCA)

Project Location Radford, VA

Laboratory Empirical Laboratories

Project Manager Diane Wisbeck

Sampler(s)/Affiliation SG, AM (ARCADIS)

0812363

	Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	SVOCs (CNT only) method 8270	PCBs method 8082					Remarks	Total
					ANALYSIS / METHOD / SIZE							
-16	A31-SB017 (0-1)	SO	12/30/08 8:45		X	X						1
-17	A31-SB017 (5-6)	SO	12/30/08 10:40		X	X						1
-18	A31-SB018 (0-1)	SO	12/30/08 8:55		X	X						1
-19	A31-SB018 (5-6)	SO	12/30/08 9:50		X	X						1
-20	A31-SB019 (0-1)	SO	12/30/08 8:20		X	X						1
-21	A31-SB019 (5-6)	SO	12/30/08 9:35		X	X						1
-22	~~DUP(SO)~~ A31-SBDUP002(0-1)	SO	12/30/08 12:00		X	X						1
-23	A31-EB001 (123008)	L	12/30/08 15:00		X	X					1L Ambers - equipment blank	4

Sample Matrix: L = Liquid; S = Solid; A = Air SO=Soil

Total No. of Bottles/Containers 27

Relinquished by: Sondra Grabowski	Organization: ARCADIS	Date 12/30/08	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 Labs	Date 12/31/08	Time 0900	(Yes) No N/A	

Special Instructions/Remarks: please contact with questions

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-12-01

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0812363 Number of Coolers: 1 of 1

Client: Arcadis Project: Radford

Date/Time Received: **12/31/08 09:00** Date cooler(s) opened: **12/31/08**

Opened By (print): **WILLIAM SCHWAB** (signature): William Schwab

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: 8963

2. Were custody seals on outside of cooler(s)? ..... (Yes) No

How many: 1 Seal date: 12/30/08 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: 0.5°C

Dates samples were logged-in: **12/31/08**

9. Initial this form to acknowledge login of sample(s): (Name): E.J. Overby (Initial): EJO

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 sufficient amount of sample sent for the analyses required?	(Yes)	No	N/A
17. Was headspace present in any included VOA vials?	Yes	No	(N/A)

If Non-Conformance issues were present, list by sample ID: _____

_____

_____ CAR#: _____

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB00
3A (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236301

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 08:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 11:14

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
121-14-2	2,4-Dinitrotoluene	31	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB00
3A (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236302

% Moisture: 24 decanted: (Y/N) N Date Sampled: 12/30/08 11:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 11:55

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
121-14-2	2,4-Dinitrotoluene	32	440		U
606-20-2	2,6-Dinitrotoluene	50	440		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
A31-SB00
4A (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236303

% Moisture: 18 decanted: (Y/N) N Date Sampled: 12/30/08 08:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 12:36

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
121-14-2	2,4-Dinitrotoluene	29	410		U
606-20-2	2,6-Dinitrotoluene	46	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB00
4A (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236304

% Moisture: 18 decanted: (Y/N) N Date Sampled: 12/30/08 10:10

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 13:18

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
121-14-2	2,4-Dinitrotoluene	29	400		U
606-20-2	2,6-Dinitrotoluene	46	400		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB012 (1-2)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236306

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 11:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 13:59

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
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB012 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236307

% Moisture: 26 decanted: (Y/N) N Date Sampled: 12/30/08 11:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 14:40

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
121-14-2	2,4-Dinitrotoluene	32	450		U
606-20-2	2,6-Dinitrotoluene	51	450		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB013 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236308

% Moisture: 19 decanted: (Y/N) N Date Sampled: 12/30/08 09:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 15:21

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
121-14-2	2,4-Dinitrotoluene	30	410		U
606-20-2	2,6-Dinitrotoluene	46	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB013 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236309

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 16:02

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
121-14-2	2,4-Dinitrotoluene	31	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB014 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236310

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 08:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 16:43

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
121-14-2	2,4-Dinitrotoluene	30	420	500	
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB014 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236311

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 10:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 17:24

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
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB015 (2-3)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-12

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236312

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 11:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 18:05

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
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB015 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-13

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236313

% Moisture: 19 decanted: (Y/N) N Date Sampled: 12/30/08 11:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 18:46

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
121-14-2	2,4-Dinitrotoluene	30	410		U
606-20-2	2,6-Dinitrotoluene	47	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB016 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-14

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236314

% Moisture: 20 decanted: (Y/N) N Date Sampled: 12/30/08 09:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 19:26

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
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	47	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB016 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-15

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236315

% Moisture: 20 decanted: (Y/N) N Date Sampled: 12/30/08 12:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 20:07

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
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	47	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB017 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-16

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236316

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 08:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 20:48

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
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB017 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-17

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236317

% Moisture: 19 decanted: (Y/N) N Date Sampled: 12/30/08 10:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 23:47

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
121-14-2	2,4-Dinitrotoluene	30	410		U
606-20-2	2,6-Dinitrotoluene	47	410		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB018 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-18

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236318

% Moisture: 28 decanted: (Y/N) N Date Sampled: 12/30/08 08:55

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/11/09 00:28

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
121-14-2	2,4-Dinitrotoluene	33	460		U
606-20-2	2,6-Dinitrotoluene	52	460		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB018 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-19

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236319

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 09:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/11/09 01:09

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
121-14-2	2,4-Dinitrotoluene	31	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB019 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-20

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236320

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 08:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/11/09 01:50

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
121-14-2	2,4-Dinitrotoluene	30	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB019 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-21

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236321

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 09:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/11/09 02:31

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
121-14-2	2,4-Dinitrotoluene	31	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SBDUP
002 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-22

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 1236322

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/05/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/11/09 05:15

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
121-14-2	2,4-Dinitrotoluene	31	420		U
606-20-2	2,6-Dinitrotoluene	48	420		U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-EB001
(123008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) WATER Lab Sample ID: 0812363-23

Sample wt/vol: 1070 (g/mL) ML Lab File ID: 1236323

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 12/30/08 15:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 06:50

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
121-14-2	2,4-Dinitrotoluene	0.46	4.7		U
606-20-2	2,6-Dinitrotoluene	0.62	4.7		U

FORM 2
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Level: (low/med) LOW

	CLIENT SAMPLE NO.	S1 (2FP) #	S2 (PHL) #	S3 (NBZ) #	S4 (FBP) #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	SBLK0102BS1	51	60	52	61	64	70			0
02	SBLK0102BS1L	44	53	46	52	55	55			0
03	A31-SB003A (	49	58	51	58	57	63			0
04	A31-SB003A (	40	47	40	46	42	50			0
05	A31-SB004A (	47	55	49	55	52	62			0
06	A31-SB004A (	50	58	48	57	53	61			0
07	A31-SB012 (1	52	59	52	59	55	63			0
08	A31-SB012 (5	39	46	39	46	39	50			0
09	A31-SB013 (0	44	51	45	52	47	57			0
10	A31-SB013 (5	38	46	39	46	43	55			0
11	A31-SB014 (0	45	53	47	54	54	63			0
12	A31-SB014 (5	46	55	46	52	48	53			0
13	A31-SB015 (2	39	47	40	46	41	51			0
14	A31-SB015 (5	36	43	37	42*	38	46			1
15	A31-SB016 (0	46	55	46	54	54	58			0
16	A31-SB016 (5	46	54	46	54	50	60			0
17	A31-SB017 (0	32*	38*	40	48	21*	54			3
18	A31-SB015 (2	50	62	54	62	60	61			0
19	A31-SB015 (2	51	59	52	57	57	57			0
20	A31-SB017 (5	49	57	50	60	56	68			0
21	A31-SB018 (0	33*	37*	33*	38*	31*	40			5
22	A31-SB018 (5	28*	34*	29*	36*	27*	38			5
23	A31-SB019 (0	33*	38*	34*	42*	35	48			4
24	A31-SB019 (5	39	45	39	48	41	54			0
25	SBLK0105BS1	55	63	55	62	60	78			0
26	SBLK0105BS1L	53	64	55	62	64	65			0
27	SBLK0105BS1L	57	72	60	69	74	72			0
28	A31-SBDUP002	56	64	56	64	67	83			0
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.: ARC.B12363

	CLIENT SAMPLE NO.	S1 (2FP)#	S2 (PHL)#	S3 (NBZ)#	S4 (FBP)#	S5 (TBP)#	S6 (TPH)#	S7 #	S8 #	TOT OUT
01	SBLK0102BW1	27	17	58	70	73	84			0
02	SBLK0102BW1L	32	20	62	74	78	78			0
03	SBLK0102BW1L	31	20	65	76	84	85			0
04	A31-EB001 (1	26	16	58	71	73	85			0
05										
06										
07										
08										
09										
10										
11										
12										
13										
14										
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27										
28										
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

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.: ARC.B12363

Matrix Spike - Client Sample No.: A31-SB015 (2-3) Lab Sample ID: 0812363-12

Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	MS CONCENTRATION (UG/KG)	MS % REC #	QC. LIMITS REC.
2,4-Dinitrotoluene	4193	0.0000	2527	60	50-115
2,6-Dinitrotoluene	4193	0.0000	2748	66	50-110

COMPOUND	SPIKE ADDED (UG/KG)	MSD CONCENTRATION (UG/KG)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
2,4-Dinitrotoluene	4193	2232	53	12	30	50-115
2,6-Dinitrotoluene	4193	2440	58	12	30	50-110

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 SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix Spike - Client Sample No.: SBLK0102BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
2,4-Dinitrotoluene	3333	0.0000	1643	49*	50-115
2,6-Dinitrotoluene	3333	0.0000	1734	52	50-110

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 2 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.: ARC.B12363

Matrix Spike - Client Sample No.: SBLK0102BW1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	LCS CONCENTRATION (UG/L)	LCS % REC #	QC. LIMITS REC.
2,4-Dinitrotoluene	50.00	0.0000	35.84	72	50-120
2,6-Dinitrotoluene	50.00	0.0000	37.66	75	50-115

COMPOUND	SPIKE ADDED (UG/L)	LCSD CONCENTRATION (UG/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
2,4-Dinitrotoluene	50.00	40.08	80	11	30	50-120
2,6-Dinitrotoluene	50.00	42.52	85	12	30	50-115

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 SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix Spike - Client Sample No.: SBLK0105BS1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (UG/KG)	SAMPLE CONCENTRATION (UG/KG)	LCS CONCENTRATION (UG/KG)	LCS % REC #	QC. LIMITS REC.
2,4-Dinitrotoluene	3333	0.0000	2123	64	50-115
2,6-Dinitrotoluene	3333	0.0000	2239	67	50-110

COMPOUND	SPIKE ADDED (UG/KG)	LCSD CONCENTRATION (UG/KG)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
2,4-Dinitrotoluene	3333	2382	71	11	30	50-115
2,6-Dinitrotoluene	3333	2497	75	11	30	50-110

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
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0102BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Lab File ID: S1BS0102 Lab Sample ID: SBLK0102BS1

Instrument ID: BNA3 Date Extracted: 01/02/09

Matrix: (soil/water) SOIL Date Analyzed: 01/10/09

Level:(low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 0951

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0102BS1L	SBLK0102BS1LCS	S1LS0102	01/10/09
02	A31-SB003A (	0812363-01	1236301	01/10/09
03	A31-SB003A (	0812363-02	1236302	01/10/09
04	A31-SB004A (	0812363-03	1236303	01/10/09
05	A31-SB004A (	0812363-04	1236304	01/10/09
06	A31-SB012 (1	0812363-06	1236306	01/10/09
07	A31-SB012 (5	0812363-07	1236307	01/10/09
08	A31-SB013 (0	0812363-08	1236308	01/10/09
09	A31-SB013 (5	0812363-09	1236309	01/10/09
10	A31-SB014 (0	0812363-10	1236310	01/10/09
11	A31-SB014 (5	0812363-11	1236311	01/10/09
12	A31-SB015 (2	0812363-12	1236312	01/10/09
13	A31-SB015 (5	0812363-13	1236313	01/10/09
14	A31-SB016 (0	0812363-14	1236314	01/10/09
15	A31-SB016 (5	0812363-15	1236315	01/10/09
16	A31-SB017 (0	0812363-16	1236316	01/10/09
17	A31-SB015 (2	0812363-12MS	1236312M	01/10/09
18	A31-SB015 (2	0812363-12MSD	1236312S	01/10/09
19	A31-SB017 (5	0812363-17	1236317	01/10/09
20	A31-SB018 (0	0812363-18	1236318	01/11/09
21	A31-SB018 (5	0812363-19	1236319	01/11/09
22	A31-SB019 (0	0812363-20	1236320	01/11/09
23	A31-SB019 (5	0812363-21	1236321	01/11/09
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0102BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0102BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0102

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 09:51

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
121-14-2	2,4-Dinitrotoluene	24	330		U
606-20-2	2,6-Dinitrotoluene	38	330		U

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0102BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Lab File ID: S1BW0102 Lab Sample ID: SBLK0102BW1

Instrument ID: BNA3 Date Extracted: 01/02/09

Matrix: (soil/water) WATER Date Analyzed: 01/10/09

Level:(low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 0325

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0102BW1L	SBLK0102BW1LCS	S1LW0102	01/10/09
02	SBLK0102BW1L	SBLK0102BW1LCS	S1DW0102	01/10/09
03	A31-EB001 (1	0812363-23	1236323	01/10/09
04				
05				
06				
07				
08				
09				
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11				
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0102BW1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) WATER Lab Sample ID: SBLK0102BW1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW0102

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:01/02/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/10/09 03:25

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
121-14-2	2,4-Dinitrotoluene	0.49	5.0		U
606-20-2	2,6-Dinitrotoluene	0.66	5.0		U

FORM 4
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

SBLK0105BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Lab File ID: S1BS0105 Lab Sample ID: SBLK0105BS1

Instrument ID: BNA3 Date Extracted: 01/05/09

Matrix: (soil/water) SOIL Date Analyzed: 01/11/09

Level:(low/med) LOW GPC Cleanup: (Y/N) N Time Analyzed: 0312

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLK0105BS1L	SBLK0105BS1LCS	S1LS0105	01/11/09
02	SBLK0105BS1L	SBLK0105BS1LCS	S1DS0105	01/11/09
03	A31-SBDUP002	0812363-22	1236322	01/11/09
04				
05				
06				
07				
08				
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COMMENTS:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SBLK0105BS1

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Matrix: (soil/water) SOIL Lab Sample ID: SBLK0105BS1

Sample wt/vol: 15.0 (g/mL) G Lab File ID: S1BS0105

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/05/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 01/11/09 03:12

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
121-14-2	2,4-Dinitrotoluene	24	330		U
606-20-2	2,6-Dinitrotoluene	38	330		U

FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Lab File ID: DF1219B1 DFTPP Injection Date: 12/19/08

Instrument ID: BNA3 DFTPP Injection Time: 1501

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	38.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	41.9
70	Less than 2.0% of mass 69	0.3 (0.6)1
127	40.0 - 60.0% of mass 198	49.1
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	6.7
275	10.0 - 30.0% of mass 198	26.6
365	Greater than 1.0% of mass 198	3.58
441	Present, but less than mass 443	10.5
442	Greater than 40.0% of mass 198	71.5
443	17.0 - 23.0% of mass 442	14.8 (20.7)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	BNACAL5.0PPM	BNACAL5.0PPM	CAL001	12/19/08	1526
02	BNACAL10PPM	BNACAL10PPM	CAL002	12/19/08	1607
03	BNACAL20PPM	BNACAL20PPM	CAL003	12/19/08	1649
04	BNACAL30PPM	BNACAL30PPM	CAL004	12/19/08	1730
05	BNACAL40PPM	BNACAL40PPM	CAL005	12/19/08	1812
06	BNACAL50PPM	BNACAL50PPM	CAL006	12/19/08	1853
07	BNACAL60PPM	BNACAL60PPM	CAL007	12/19/08	1935
08	BNACAL70PPM	BNACAL70PPM	CAL008	12/19/08	2016
09	BNACAL80PPM	BNACAL80PPM	CAL009	12/19/08	2057
10	BNACAL100PPM	BNACAL100PPM	CAL010	12/19/08	2138
11	BNAACAL5.0PP	BNAACAL5.0PPM	CAL001A	12/19/08	2219
12	BNAACAL10PPM	BNAACAL10PPM	CAL002A	12/19/08	2259
13	BNAACAL20PPM	BNAACAL20PPM	CAL003A	12/19/08	2340
14	BNAACAL30PPM	BNAACAL30PPM	CAL004A	12/20/08	0021
15	BNAACAL40PPM	BNAACAL40PPM	CAL005A	12/20/08	0101
16	BNAACAL50PPM	BNAACAL50PPM	CAL006A	12/20/08	0142
17	BNAACAL60PPM	BNAACAL60PPM	CAL007A	12/20/08	0223
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157A

Lab File ID: DF1219B2 DFTPP Injection Date: 12/20/08

Instrument ID: BNA3 DFTPP Injection Time: 0256

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30.0 - 60.0% of mass 198	37.1	
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	(0.5)1
127	40.0 - 60.0% of mass 198	48.8	
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	27.4	
365	Greater than 1.0% of mass 198	3.74	
441	Present, but less than mass 443	11.4	
442	Greater than 40.0% of mass 198	75.9	
443	17.0 - 23.0% of mass 442	14.6	(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	BNAACAL70PPM	BNAACAL70PPM	CAL008A	12/20/08	0320
02	BNAACAL80PPM	BNAACAL80PPM	CAL009A	12/20/08	0400
03	BNAACAL100PP	BNAACAL100PPM	CAL010A	12/20/08	0441
04	ICVMAIN-50PP	ICVMAIN-50PPM	ICV1A	12/20/08	0602
05	ICVCUSTOM-50	ICVCUSTOM-50PP	ICV2	12/20/08	0643
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157B

Lab File ID: DF1220B1 DFTPP Injection Date: 12/20/08

Instrument ID: BNA3 DFTPP Injection Time: 1151

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	35.6
68	Less than 2.0% of mass 69	0.2 (0.4)1
69	Mass 69 relative abundance	39.4
70	Less than 2.0% of mass 69	0.1 (0.4)1
127	40.0 - 60.0% of mass 198	48.5
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	6.7
275	10.0 - 30.0% of mass 198	27.8
365	Greater than 1.0% of mass 198	3.67
441	Present, but less than mass 443	11.6
442	Greater than 40.0% of mass 198	77.5
443	17.0 - 23.0% of mass 442	14.8 (19.1)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	ICV3-50PPM	ICV3-50PPM	ICV3	12/20/08	1335
02					
03					
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05					
06					
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FORM 5
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157C

Lab File ID: DF0102B1 DFTPP Injection Date: 01/02/09

Instrument ID: BNA3 DFTPP Injection Time: 1320

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	38.1
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	42.6
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	40.0 - 60.0% of mass 198	50.2
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	6.6
275	10.0 - 30.0% of mass 198	26.8
365	Greater than 1.0% of mass 198	3.30
441	Present, but less than mass 443	12.1
442	Greater than 40.0% of mass 198	84.5
443	17.0 - 23.0% of mass 442	16.6 (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		BNACAL1PPM	STD01	01/02/09	1424
02		BNACAL2PPM	STD02	01/02/09	1505
03		ICV50PPM	ICV01	01/02/09	1546
04		ICV50PPM	ICV04	01/02/09	1632
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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.: ARC.B12363

Lab File ID: DF0105B9 DFTPP Injection Date: 01/09/09

Instrument ID: BNA3 DFTPP Injection Time: 1931

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	36.0
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	40.0
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	40.0 - 60.0% of mass 198	49.2
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	27.6
365	Greater than 1.0% of mass 198	3.77
441	Present, but less than mass 443	12.2
442	Greater than 40.0% of mass 198	80.4
443	17.0 - 23.0% of mass 442	16.8 (20.9)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	CCV050WL	01/09/09	1956
02	SBLK0102BW1	SBLK0102BW1	S1BW0102	01/10/09	0325
03	SBLK0102BW1L	SBLK0102BW1LCS	S1LW0102	01/10/09	0406
04	SBLK0102BW1L	SBLK0102BW1LCS	S1DW0102	01/10/09	0448
05	A31-EB001 (1	0812363-23	1236323	01/10/09	0650
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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.: ARC.B12363

Lab File ID: DF0105B10 DFTPP Injection Date: 01/10/09

Instrument ID: BNA3 DFTPP Injection Time: 0846

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	48.5
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	54.6
70	Less than 2.0% of mass 69	0.3 (0.5)1
127	40.0 - 60.0% of mass 198	55.3
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	6.6
275	10.0 - 30.0% of mass 198	22.3
365	Greater than 1.0% of mass 198	2.42
441	Present, but less than mass 443	6.6
442	Greater than 40.0% of mass 198	44.5
443	17.0 - 23.0% of mass 442	9.4 (21.1)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	CCV050SM	01/10/09	0910
02	SBLK0102BS1	SBLK0102BS1	S1BS0102	01/10/09	0951
03	SBLK0102BS1L	SBLK0102BS1LCS	S1LS0102	01/10/09	1032
04	A31-SB003A (	0812363-01	1236301	01/10/09	1114
05	A31-SB003A (	0812363-02	1236302	01/10/09	1155
06	A31-SB004A (	0812363-03	1236303	01/10/09	1236
07	A31-SB004A (	0812363-04	1236304	01/10/09	1318
08	A31-SB012 (1	0812363-06	1236306	01/10/09	1359
09	A31-SB012 (5	0812363-07	1236307	01/10/09	1440
10	A31-SB013 (0	0812363-08	1236308	01/10/09	1521
11	A31-SB013 (5	0812363-09	1236309	01/10/09	1602
12	A31-SB014 (0	0812363-10	1236310	01/10/09	1643
13	A31-SB014 (5	0812363-11	1236311	01/10/09	1724
14	A31-SB015 (2	0812363-12	1236312	01/10/09	1805
15	A31-SB015 (5	0812363-13	1236313	01/10/09	1846
16	A31-SB016 (0	0812363-14	1236314	01/10/09	1926
17	A31-SB016 (5	0812363-15	1236315	01/10/09	2007
18	A31-SB017 (0	0812363-16	1236316	01/10/09	2048
19	A31-SB015 (2	0812363-12MS	1236312M	01/10/09	2129
20	A31-SB015 (2	0812363-12MSD	1236312S	01/10/09	2209
21					
22					

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.: ARC.B12363

Lab File ID: DF0105B11 DFTPP Injection Date: 01/10/09

Instrument ID: BNA3 DFTPP Injection Time: 2242

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	49.8
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	49.6
70	Less than 2.0% of mass 69	0.1 (0.2)1
127	40.0 - 60.0% of mass 198	54.9
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	6.9
275	10.0 - 30.0% of mass 198	24.5
365	Greater than 1.0% of mass 198	2.67
441	Present, but less than mass 443	6.8
442	Greater than 40.0% of mass 198	42.7
443	17.0 - 23.0% of mass 442	8.6 (20.1)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	CCV050SN	01/10/09	2306
02	A31-SB017 (5	0812363-17	1236317	01/10/09	2347
03	A31-SB018 (0	0812363-18	1236318	01/11/09	0028
04	A31-SB018 (5	0812363-19	1236319	01/11/09	0109
05	A31-SB019 (0	0812363-20	1236320	01/11/09	0150
06	A31-SB019 (5	0812363-21	1236321	01/11/09	0231
07	SBLK0105BS1	SBLK0105BS1	S1BS0105	01/11/09	0312
08	SBLK0105BS1L	SBLK0105BS1LCS	S1LS0105	01/11/09	0353
09	SBLK0105BS1L	SBLK0105BS1LCS	S1DS0105	01/11/09	0434
10	A31-SBDUP002	0812363-22	1236322	01/11/09	0515
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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.: ARC.B12363

Lab File ID (Standard): CCV050WL Date Analyzed: 01/09/09

Instrument ID: BNA3 Time Analyzed: 1956

		IS1 (DCB) AREA	#	RT	#	IS2 (NPT) AREA	#	RT	#	IS3 (ANT) AREA	#	RT	#
	12 HOUR STD	452973		5.29		1656772		6.64		1015296		9.77	
	UPPER LIMIT	905946		5.79		3313544		7.14		2030592		10.27	
	LOWER LIMIT	226487		4.79		828386		6.14		507648		9.27	
	CLIENT SAMPLE NO.												
01	SBLK0102BW1	519308		5.29		1920736		6.63		1154991		9.77	
02	SBLK0102BW1L	389418		5.29		1486429		6.64		909142		9.77	
03	SBLK0102BW1L	520902		5.29		1937839		6.64		1186910		9.78	
04	A31-EB001 (1	414070		5.29		1555276		6.64		929993		9.77	
05													
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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.: ARC.B12363

Lab File ID (Standard): CCV050WL Date Analyzed: 01/09/09

Instrument ID: BNA3 Time Analyzed: 1956

		IS4(PHN) AREA	#	RT	#	IS5(CRY) AREA	#	RT	#	IS6(PRY) AREA	#	RT	#
	12 HOUR STD	1712102		13.57		1584512		21.31		1000100		25.36	
	UPPER LIMIT	3424204		14.07		3169024		21.81		2000200		25.86	
	LOWER LIMIT	856051		13.07		792256		20.81		500050		24.86	
	CLIENT SAMPLE NO.												
01	SBLK0102BW1	1834938		13.57		1697994		21.31		1160504		25.36	
02	SBLK0102BW1L	1507188		13.58		1490061		21.32		1029372		25.37	
03	SBLK0102BW1L	1972381		13.58		1896542		21.33		1238455		25.37	
04	A31-EB001 (1	1504895		13.57		1393607		21.30		934119		25.37	
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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.: ARC.B12363

Lab File ID (Standard): CCV050SM Date Analyzed: 01/10/09

Instrument ID: BNA3 Time Analyzed: 0910

		IS1 (DCB) AREA	#	RT	#	IS2 (NPT) AREA	#	RT	#	IS3 (ANT) AREA	#	RT	#
	12 HOUR STD	421849		5.30		1605661		6.64		995663		9.78	
	UPPER LIMIT	843698		5.80		3211322		7.14		1991326		10.28	
	LOWER LIMIT	210925		4.80		802831		6.14		497832		9.28	
	CLIENT SAMPLE NO.												
01	SBLK0102BS1	537928		5.29		2056327		6.64		1258394		9.77	
02	SBLK0102BS1L	531640		5.29		2027696		6.64		1275879		9.78	
03	A31-SB003A (	469132		5.29		1788654		6.64		1109686		9.77	
04	A31-SB003A (	411518		5.30		1572723		6.64		974890		9.77	
05	A31-SB004A (	481859		5.29		1796443		6.64		1111512		9.78	
06	A31-SB004A (	414882		5.29		1610010		6.64		980980		9.78	
07	A31-SB012 (1	427285		5.29		1602542		6.64		985362		9.78	
08	A31-SB012 (5	403605		5.29		1556847		6.64		942896		9.77	
09	A31-SB013 (0	421808		5.29		1614824		6.64		971178		9.77	
10	A31-SB013 (5	411017		5.29		1551177		6.63		950625		9.77	
11	A31-SB014 (0	440438		5.29		1655597		6.64		1011664		9.77	
12	A31-SB014 (5	425273		5.29		1631152		6.63		989087		9.76	
13	A31-SB015 (2	456252		5.29		1720908		6.63		1039257		9.76	
14	A31-SB015 (5	500999		5.29		1860636		6.63		1143589		9.77	
15	A31-SB016 (0	475380		5.29		1807101		6.63		1101089		9.76	
16	A31-SB016 (5	407167		5.29		1537525		6.63		932581		9.76	
17	A31-SB017 (0	393849		5.28		1470786		6.63		885045		9.76	
18	A31-SB015 (2	432737		5.29		1663463		6.63		1024634		9.77	
19	A31-SB015 (2	449105		5.29		1693327		6.63		1058414		9.76	
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.: ARC.B12363

Lab File ID (Standard): CCV050SM Date Analyzed: 01/10/09

Instrument ID: BNA3 Time Analyzed: 0910

		IS4(PHN) AREA	#	RT	#	IS5(CRY) AREA	#	RT	#	IS6(PRY) AREA	#	RT	#
	12 HOUR STD	1693716		13.58		1589124		21.32		995128		25.37	
	UPPER LIMIT	3387432		14.08		3178248		21.82		1990256		25.87	
	LOWER LIMIT	846858		13.08		794562		20.82		497564		24.87	
	CLIENT SAMPLE NO.												
01	SBLK0102BS1	2006834		13.58		1902407		21.31		1318594		25.37	
02	SBLK0102BS1L	2178525		13.58		2122549		21.33		1482106		25.38	
03	A31-SB003A (	1775416		13.58		1687386		21.31		1104417		25.37	
04	A31-SB003A (	1567644		13.57		1437753		21.31		985151		25.37	
05	A31-SB004A (	1755465		13.58		1460874		21.31		933517		25.37	
06	A31-SB004A (	1541044		13.58		1419038		21.31		959434		25.37	
07	A31-SB012 (1	1586891		13.58		1458763		21.31		955873		25.37	
08	A31-SB012 (5	1498564		13.57		1285613		21.31		828979		25.37	
09	A31-SB013 (0	1546858		13.57		1393333		21.30		917523		25.37	
10	A31-SB013 (5	1487802		13.57		1326846		21.30		916793		25.36	
11	A31-SB014 (0	1623847		13.57		1456773		21.30		1009944		25.36	
12	A31-SB014 (5	1559390		13.57		1385543		21.30		939278		25.36	
13	A31-SB015 (2	1634992		13.56		1410639		21.30		932251		25.36	
14	A31-SB015 (5	1800311		13.56		1608134		21.30		1029265		25.36	
15	A31-SB016 (0	1762675		13.56		1663288		21.29		1119017		25.36	
16	A31-SB016 (5	1456782		13.56		1288238		21.29		842581		25.35	
17	A31-SB017 (0	1384929		13.56		1141348		21.29		732997		25.35	
18	A31-SB015 (2	1722445		13.56		1666043		21.31		1143097		25.36	
19	A31-SB015 (2	1774722		13.56		1698040		21.30		1135506		25.36	
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 UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

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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.: ARC.B12363

Lab File ID (Standard): CCV050SN Date Analyzed: 01/10/09

Instrument ID: BNA3 Time Analyzed: 2306

		IS1 (DCB) AREA	#	RT	#	IS2 (NPT) AREA	#	RT	#	IS3 (ANT) AREA	#	RT	#
	12 HOUR STD	459289		5.28		1691052		6.63		1043662		9.76	
	UPPER LIMIT	918578		5.78		3382104		7.13		2087324		10.26	
	LOWER LIMIT	229645		4.78		845526		6.13		521831		9.26	
	CLIENT SAMPLE NO.												
01	A31-SB017 (5	448333		5.29		1657485		6.63		988505		9.76	
02	A31-SB018 (0	448233		5.29		1687012		6.63		1005718		9.76	
03	A31-SB018 (5	452459		5.28		1681298		6.62		1014223		9.75	
04	A31-SB019 (0	429784		5.28		1591824		6.62		972050		9.75	
05	A31-SB019 (5	493868		5.28		1818629		6.62		1091301		9.75	
06	SBLK0105BS1	451257		5.28		1690565		6.63		1021683		9.76	
07	SBLK0105BS1L	437966		5.28		1652787		6.63		1027795		9.76	
08	SBLK0105BS1L	517831		5.28		1941086		6.63		1205691		9.76	
09	A31-SBDUP002	500961		5.28		1873162		6.63		1124231		9.75	
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22													

IS1 (DCB) = 1,4-Dichlorobenzene-d4
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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.: ARC.B12363

Lab File ID (Standard): CCV050SN Date Analyzed: 01/10/09

Instrument ID: BNA3 Time Analyzed: 2306

		IS4(PHN) AREA	#	RT	#	IS5(CRY) AREA	#	RT	#	IS6(PRY) AREA	#	RT	#
	12 HOUR STD	1758065		13.57		1705700		21.31		1121326		25.36	
	UPPER LIMIT	3516130		14.07		3411400		21.81		2242652		25.86	
	LOWER LIMIT	879033		13.07		852850		20.81		560663		24.86	
	CLIENT SAMPLE NO.												
01	A31-SB017 (5	1554772		13.56		1309150		21.29		850880		25.35	
02	A31-SB018 (0	1569300		13.56		1332116		21.29		879164		25.35	
03	A31-SB018 (5	1571446		13.55		1381710		21.29		918659		25.35	
04	A31-SB019 (0	1532142		13.55		1356201		21.29		895589		25.35	
05	A31-SB019 (5	1663282		13.55		1377504		21.29		805227		25.35	
06	SBLK0105BS1	1575443		13.55		1232411		21.28		743309		25.35	
07	SBLK0105BS1L	1713143		13.56		1593992		21.30		1084427		25.35	
08	SBLK0105BS1L	1989157		13.56		1922838		21.31		1292185		25.36	
09	A31-SBDUP002	1712425		13.56		1385133		21.28		816554		25.35	
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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
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 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF1: STD01 RF2: STD02 RF5: CAL001
RF10: CAL002 RF20: CAL003

COMPOUND	RF1	RF2	RF5	RF10	RF20
Acenaphthene	0.945	1.027	0.994	1.052	1.048
Acenaphthylene	1.047	1.248	1.271	1.384	1.378
Acetophenone	1.409	1.571	1.484	1.634	1.679
Aniline		1.078	1.174	1.250	1.326
Anthracene	0.909	1.026	1.029	1.100	1.112
Benzoic acid			0.069	0.102	0.141
Benzo(a)anthracene	0.851	0.956	0.977	1.067	1.104
Benzo(b)fluoranthene	0.711	0.916	0.998	1.182	1.197
Benzo(k)fluoranthene	0.660	0.902	1.044	1.192	1.216
Benzo(g,h,i)perylene	0.549	0.654	0.792	0.774	0.899
Benzo(a)pyrene	0.673	0.792	0.889	0.979	1.052
Benzyl alcohol	0.530	0.576	0.556	0.583	0.664
bis(2-Chloroethoxy)methane	0.278	0.340	0.316	0.351	0.356
1,1'-Biphenyl	1.241	1.409	1.389	1.456	1.449
bis(2-Chloroethyl)ether	1.227	1.292	1.278	1.394	1.408
bis(2-Chloroisopropyl)ether	1.186	1.296	1.257	1.323	1.357
Bis(2-ethylhexyl)phthalate	0.313	0.425	0.661	0.755	0.797
4-Bromophenyl-phenylether	0.234	0.282	0.277	0.302	0.301
Butylbenzylphthalate	0.333	0.380	0.530	0.605	0.641
Carbazole		0.832	0.746	0.755	0.611
4-Chloroaniline	0.217	0.255	0.259	0.282	0.304
Caprolactam			0.069	0.082	0.087
4-Chloro-3-methylphenol		0.202	0.223	0.251	0.260
2-Chloronaphthalene	1.036	1.144	1.143	1.195	1.167
2-Chlorophenol	0.975	1.110	1.034	1.144	1.158
4-Chlorophenyl-phenylether	0.604	0.674	0.677	0.708	0.710
Chrysene	0.852	0.939	0.942	1.023	1.022
Dibenz(a,h)anthracene	0.456	0.614	0.643	0.686	0.836
Dibenzofuran	1.314	1.465	1.519	1.637	1.600
1,4-Dichlorobenzene	1.398	1.594	1.576	1.651	1.654
1,2-Dichlorobenzene	1.300	1.494	1.429	1.547	1.561
1,3-Dichlorobenzene	1.347	1.593	1.510	1.654	1.639
2,4-Dichlorophenol		0.227	0.240	0.265	0.283
Diethylphthalate	0.978	1.185	1.220	1.380	1.387
2,4-Dimethylphenol	0.232	0.266	0.286	0.285	0.284
Dimethylphthalate	1.175	1.386	1.313	1.478	1.487
Di-n-butylphthalate		1.047	1.187	1.385	1.422

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FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF1: STD01 RF2: STD02 RF5: CAL001
RF10: CAL002 RF20: CAL003

COMPOUND	RF1	RF2	RF5	RF10	RF20
4,6-Dinitro-2-methylphenol			0.044	0.075	0.105
2,4-Dinitrophenol			0.024	0.052	0.086
2,4-Dinitrotoluene	0.182	0.241	0.338	0.407	0.432
2,6-Dinitrotoluene		0.225	0.278	0.318	0.340
Di-n-octylphthalate			1.131	1.466	1.555
1,2-Diphenylhydrazine	0.717	0.837	0.792	0.858	0.852
Fluoranthene	0.849	0.986	1.097	1.240	1.258
Fluorene	0.947	1.120	1.156	1.283	1.282
Hexachlorobenzene	0.237	0.276	0.252	0.278	0.276
Hexachlorobutadiene	0.220	0.241	0.250	0.271	0.275
Hexachlorocyclopentadiene		0.093	0.109	0.183	0.194
Hexachloroethane	0.448	0.525	0.487	0.509	0.535
Indeno(1,2,3-cd)pyrene	0.581	0.473	0.655	0.702	0.820
Isophorone	0.541	0.616	0.572	0.642	0.653
2-Methylnaphthalene	0.473	0.528	0.504	0.558	0.562
1-Methylnaphthalene	0.457	0.511	0.500	0.540	0.537
4-Methylphenol	0.812	0.912	0.807	0.866	0.916
2-Methylphenol	0.690	0.912	0.862	0.922	0.942
Naphthalene	0.818	0.933	0.892	0.973	0.978
3-Methylphenol	0.812	0.912	0.807	0.866	0.916
2-Nitroaniline		0.184	0.261	0.300	0.325
3-Nitroaniline		0.140	0.191	0.202	0.200
4-Nitroaniline		0.070	0.086	0.062	0.096
Nitrobenzene	0.370	0.405	0.393	0.428	0.433
2-Nitrophenol		0.102	0.133	0.156	0.164
4-Nitrophenol			0.098	0.138	0.173
N-Nitroso-di-methylamine		0.506	0.467	0.572	0.651
N-Nitrosodiphenylamine	0.522	0.603	0.533	0.575	0.574
N-Nitroso-di-n-propylamine	0.752	0.786	0.802	0.864	0.868
Pentachlorophenol			0.067	0.094	0.125
Phenanthrene	1.013	1.145	1.073	1.160	1.154
Phenol	1.167	1.327	1.242	1.379	1.407
Pyrene	1.019	1.196	1.150	1.322	1.326
Pyridine		0.588	0.622	0.930	0.997
1,2,4,5-Tetrachlorobenzene		0.333	0.330	0.369	0.357
1,2,4-Trichlorobenzene	0.358	0.375	0.375	0.401	0.407
2,4,5-Trichlorophenol		0.275	0.330	0.361	0.377

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF1: STD01 RF2: STD02 RF5: CAL001
RF10: CAL002 RF20: CAL003

COMPOUND	RF1	RF2	RF5	RF10	RF20
2,4,6-Trichlorophenol		0.265	0.328	0.358	0.372
2-Fluorophenol		1.001	0.942	1.102	1.141
Phenol-d6	1.038	1.207	1.160	1.243	1.288
Nitrobenzene-d5	0.309	0.369	0.371	0.412	0.423
2-Fluorobiphenyl	1.197	1.393	1.350	1.437	1.407
2,4,6-Tribromophenol		0.071	0.092	0.099	0.105
Terphenyl-d14			0.842	0.950	0.957

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF30: CAL004 RF40: CAL005 RF50: CAL006
RF60: CAL007 RF70: CAL008

COMPOUND	RF30	RF40	RF50	RF60	RF70
Acenaphthene	1.151	1.155	1.151	1.089	1.107
Acenaphthylene	1.514	1.485	1.497	1.414	1.441
Acetophenone	1.812	1.819	1.843	1.739	1.756
Aniline	1.462	1.503	1.554	1.471	1.524
Anthracene	1.210	1.218	1.204	1.131	1.153
Benzoic acid	0.185	0.190	0.197	0.208	0.220
Benzo(a)anthracene	1.205	1.208	1.195	1.131	1.162
Benzo(b)fluoranthene	1.319	1.358	1.348	1.278	1.303
Benzo(k)fluoranthene	1.330	1.326	1.332	1.255	1.286
Benzo(g,h,i)perylene	0.952	0.983	0.908	0.877	0.888
Benzo(a)pyrene	1.172	1.194	1.185	1.123	1.154
Benzyl alcohol	0.749	0.750	0.777	0.749	0.764
bis(2-Chloroethoxy)methane	0.394	0.402	0.402	0.385	0.386
1,1'-Biphenyl	1.563	1.544	1.537	1.472	1.501
bis(2-Chloroethyl)ether	1.554	1.521	1.520	1.443	1.421
bis(2-Chloroisopropyl)ether	1.443	1.438	1.433	1.322	1.327
Bis(2-ethylhexyl)phthalate	0.870	0.902	0.863	0.809	0.824
4-Bromophenyl-phenylether	0.330	0.329	0.324	0.313	
Butylbenzylphthalate	0.709	0.715	0.702	0.670	0.670
Carbazole	0.668	0.716	0.716	0.710	0.747
4-Chloroaniline	0.359	0.360	0.379	0.375	0.379
Caprolactam	0.099	0.100	0.095	0.091	0.092
4-Chloro-3-methylphenol	0.299	0.296	0.298	0.294	0.296
2-Chloronaphthalene	1.260	1.245	1.230	1.185	1.202
2-Chlorophenol	1.324	1.335	1.359	1.293	1.329
4-Chlorophenyl-phenylether	0.759	0.758	0.757	0.709	0.727
Chrysene	1.112	1.109	1.086	1.030	1.066
Dibenz(a,h)anthracene	0.870	0.940	0.882	0.840	0.870
Dibenzofuran	1.735	1.706	1.723	1.621	1.654
1,4-Dichlorobenzene	1.800	1.791	1.802	1.705	1.715
1,2-Dichlorobenzene	1.684	1.676	1.686	1.585	1.614
1,3-Dichlorobenzene	1.770	1.738	1.767	1.659	1.674
2,4-Dichlorophenol	0.316	0.317	0.322	0.313	0.320
Diethylphthalate	1.542	1.547	1.560	1.459	1.497
2,4-Dimethylphenol	0.321	0.321	0.318	0.320	0.318
Dimethylphthalate	1.665	1.666	1.659	1.582	1.594
Di-n-butylphthalate	1.556	1.554	1.547	1.447	1.473

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF30: CAL004 RF40: CAL005 RF50: CAL006
RF60: CAL007 RF70: CAL008

COMPOUND	RF30	RF40	RF50	RF60	RF70
4,6-Dinitro-2-methylphenol	0.132	0.135	0.142	0.140	0.151
2,4-Dinitrophenol	0.121	0.125	0.141	0.143	0.161
2,4-Dinitrotoluene	0.494	0.491	0.502	0.478	0.488
2,6-Dinitrotoluene	0.381	0.385	0.385	0.367	0.368
Di-n-octylphthalate	1.744	1.810	1.820	1.732	1.735
1,2-Diphenylhydrazine	0.921	0.923	0.897	0.837	0.844
Fluoranthene	1.361	1.356	1.356	1.265	1.303
Fluorene	1.400	1.378	1.392	1.302	1.352
Hexachlorobenzene	0.295	0.295	0.288	0.277	0.279
Hexachlorobutadiene	0.296	0.293	0.292	0.281	0.284
Hexachlorocyclopentadiene	0.236	0.219	0.222	0.247	0.252
Hexachloroethane	0.602	0.597	0.613	0.598	0.606
Indeno(1,2,3-cd)pyrene	0.912	0.919	0.886	0.837	0.885
Isophorone	0.737	0.749	0.755	0.724	0.725
2-Methylnaphthalene	0.612	0.609	0.609	0.578	0.589
1-Methylnaphthalene	0.579	0.572	0.578	0.540	0.556
4-Methylphenol	1.067	1.053	1.109	1.074	1.114
2-Methylphenol	1.078	1.059	1.112	1.059	1.082
Naphthalene	1.057	1.046	1.051	0.996	1.016
3-Methylphenol	1.067	1.053	1.109	1.074	1.114
2-Nitroaniline	0.365	0.362	0.368	0.356	0.357
3-Nitroaniline	0.220	0.240	0.254	0.255	0.268
4-Nitroaniline	0.114	0.132	0.151	0.148	0.174
Nitrobenzene	0.474	0.466	0.464	0.440	0.437
2-Nitrophenol	0.180	0.184	0.188	0.185	0.191
4-Nitrophenol	0.218	0.214	0.225	0.222	0.235
N-Nitroso-di-methylamine	0.749	0.716	0.718	0.717	0.690
N-Nitrosodiphenylamine	0.646	0.656	0.647	0.633	0.635
N-Nitroso-di-n-propylamine	0.981	0.984	0.986	0.931	0.933
Pentachlorophenol	0.151	0.153	0.162	0.163	0.172
Phenanthrene	1.235	1.241	1.226	1.161	1.180
Phenol	1.579	1.585	1.648	1.566	1.597
Pyrene	1.471	1.471	1.430	1.385	1.360
Pyridine	1.059	1.150	1.114	1.086	1.092
1,2,4,5-Tetrachlorobenzene	0.388	0.384	0.388	0.370	0.382
1,2,4-Trichlorobenzene	0.442	0.438	0.438	0.415	0.424
2,4,5-Trichlorophenol	0.433	0.434	0.436	0.436	0.438

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF30: CAL004 RF40: CAL005 RF50: CAL006
RF60: CAL007 RF70: CAL008

COMPOUND	RF30	RF40	RF50	RF60	RF70
2,4,6-Trichlorophenol	0.420	0.418	0.423	0.415	0.420
2-Fluorophenol	1.273	1.279	1.306	1.241	1.257
Phenol-d6	1.467	1.478	1.537	1.477	1.515
Nitrobenzene-d5	0.457	0.448	0.446	0.426	0.420
2-Fluorobiphenyl	1.524	1.506	1.484	1.433	1.443
2,4,6-Tribromophenol	0.119	0.120	0.120	0.120	0.122
Terphenyl-d14	1.066	1.058	1.031	1.001	0.993

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF80: CAL009 RF90: RF100: CAL010

COMPOUND	RF80	RF90	RF100
Acenaphthene	1.119		1.114
Acenaphthylene	1.453		1.457
Acetophenone	1.779		1.768
Aniline	1.515		1.563
Anthracene	1.163		1.151
Benzoic acid	0.225		0.234
Benzo(a)anthracene	1.164		1.149
Benzo(b)fluoranthene	1.322		1.300
Benzo(k)fluoranthene	1.293		1.291
Benzo(g,h,i)perylene	0.932		0.884
Benzo(a)pyrene	1.168		1.155
Benzyl alcohol	0.788		0.802
bis(2-Chloroethoxy)methane	0.392		0.383
1,1'-Biphenyl	1.525		1.523
bis(2-Chloroethyl)ether	1.459		1.409
bis(2-Chloroisopropyl)ether	1.315		1.284
Bis(2-ethylhexyl)phthalate	0.827		0.816
4-Bromophenyl-phenylether			
Butylbenzylphthalate	0.675		0.652
Carbazole	0.759		0.810
4-Chloroaniline	0.391		0.390
Caprolactam	0.095		0.089
4-Chloro-3-methylphenol	0.305		0.300
2-Chloronaphthalene	1.223		1.216
2-Chlorophenol	1.344		1.361
4-Chlorophenyl-phenylether	0.726		0.732
Chrysene	1.054		1.048
Dibenz(a,h)anthracene	0.915		0.882
Dibenzofuran	1.667		1.686
1,4-Dichlorobenzene	1.734		1.747
1,2-Dichlorobenzene	1.628		1.632
1,3-Dichlorobenzene	1.680		1.682
2,4-Dichlorophenol	0.331		0.328
Diethylphthalate	1.488		1.503
2,4-Dimethylphenol	0.325		0.321
Dimethylphthalate	1.609		1.595
Di-n-butylphthalate	1.464		1.471

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF80: CAL009 RF90: RF100: CAL010

COMPOUND	RF80	RF90	RF100
4,6-Dinitro-2-methylphenol	0.155		0.160
2,4-Dinitrophenol	0.163		0.175
2,4-Dinitrotoluene	0.486		0.498
2,6-Dinitrotoluene	0.373		0.371
Di-n-octylphthalate	1.773		1.745
1,2-Diphenylhydrazine	0.857		0.823
Fluoranthene	1.289		1.314
Fluorene	1.344		1.368
Hexachlorobenzene	0.283		0.280
Hexachlorobutadiene	0.286		0.278
Hexachlorocyclopentadiene	0.262		0.233
Hexachloroethane	0.612		0.617
Indeno(1,2,3-cd)pyrene	0.929		0.900
Isophorone	0.733		0.717
2-Methylnaphthalene	0.602		0.600
1-Methylnaphthalene	0.564		0.560
4-Methylphenol	1.145		1.189
2-Methylphenol	1.099		1.118
Naphthalene	1.032		1.014
3-Methylphenol	1.145		1.189
2-Nitroaniline	0.364		0.354
3-Nitroaniline	0.276		0.281
4-Nitroaniline	0.190		0.209
Nitrobenzene	0.444		0.427
2-Nitrophenol	0.198		0.195
4-Nitrophenol	0.236		0.241
N-Nitroso-di-methylamine	0.709		0.693
N-Nitrosodiphenylamine	0.657		0.630
N-Nitroso-di-n-propylamine	0.930		0.934
Pentachlorophenol	0.174		0.178
Phenanthrene	1.182		1.179
Phenol	1.627		1.655
Pyrene	1.386		1.329
Pyridine	1.088		1.076
1,2,4,5-Tetrachlorobenzene	0.387		0.385
1,2,4-Trichlorobenzene	0.427		0.421
2,4,5-Trichlorophenol	0.452		0.458

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF80: CAL009 RF90: RF100: CAL010

COMPOUND	RF80	RF90	RF100
2,4,6-Trichlorophenol	0.434		0.435
2-Fluorophenol	1.265		1.275
Phenol-d6	1.542		1.554
Nitrobenzene-d5	0.426		0.412
2-Fluorobiphenyl	1.471		1.447
2,4,6-Tribromophenol	0.130		0.127
Terphenyl-d14	1.021		0.972

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2
Acenaphthene	AVRG		1.07945326		6.2
Acenaphthylene	AVRG		1.38250039		9.7
Acetophenone	AVRG		1.69108568		8.2
Aniline	AVRG		1.40193291		12.0
Anthracene	AVRG		1.11712517		8.1
Benzoic acid	2ORDR	0.00000000	5.66915548	-2.5304858	0.997
Benzo(a)anthracene	AVRG		1.09750515		10.3
Benzo(b)fluoranthene	LINR	0.00000000	1.30873494		0.999
Benzo(k)fluoranthene	LINR	0.00000000	1.29152149		0.999
Benzo(g,h,i)perylene	LINR	0.00000000	0.90353793		0.997
Benzo(a)pyrene	LINR	0.00000000	1.15731922		0.999
Benzyl alcohol	AVRG		0.69070945		14.7
bis(2-Chloroethoxy)methane	AVRG		0.36549424		10.6
1,1'-Biphenyl	AVRG		1.46750327		6.1
bis(2-Chloroethyl)ether	AVRG		1.41058198		7.2
bis(2-Chloroisopropyl)ether	AVRG		1.33193696		5.8
Bis(2-ethylhexyl)phthalate	LINR	0.00000000	0.82881562		0.998
4-Bromophenyl-phenylether	AVRG		0.29914304		10.4
Butylbenzylphthalate	LINR	0.00000000	0.67109765		0.998
Carbazole	AVRG		0.73366440		8.3
4-Chloroaniline	LINR	0.00000000	0.38233314		0.996
Caprolactam	AVRG		8.979e-002		10.3
4-Chloro-3-methylphenol	AVRG		0.27487975		13.0
2-Chloronaphthalene	AVRG		1.18729668		5.1
2-Chlorophenol	AVRG		1.23058643		11.3
4-Chlorophenyl-phenylether	AVRG		0.71178576		6.2
Chrysene	AVRG		1.02368324		7.5
Dibenz(a,h)anthracene	LINR	0.00000000	0.88420924		0.997
Dibenzofuran	AVRG		1.61067406		7.6
1,4-Dichlorobenzene	AVRG		1.68061686		7.0
1,2-Dichlorobenzene	AVRG		1.56968521		7.3
1,3-Dichlorobenzene	AVRG		1.64292771		7.2
2,4-Dichlorophenol	AVRG		0.29665350		12.5
Diethylphthalate	AVRG		1.39544659		12.9
2,4-Dimethylphenol	AVRG		0.29971412		9.8
Dimethylphthalate	AVRG		1.51749833		10.3
Di-n-butylphthalate	AVRG		1.41380251		11.3

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2
4,6-Dinitro-2-methylphenol	2ORDR	0.00000000	8.00299274	-4.6293584	0.997
2,4-Dinitrophenol	2ORDR	0.00000000	8.33077011	-6.2979876	0.995
2,4-Dinitrotoluene	LINR	0.00000000	0.49059749		0.998
2,6-Dinitrotoluene	AVRG		0.34474409		15.0
Di-n-octylphthalate	AVRG		1.65117183		13.0
1,2-Diphenylhydrazine	AVRG		0.84654555		6.6
Fluoranthene	AVRG		1.22284470		13.2
Fluorene	AVRG		1.27711333		10.7
Hexachlorobenzene	AVRG		0.27640922		6.0
Hexachlorobutadiene	AVRG		0.27228540		8.6
Hexachlorocyclopentadiene	2ORDR	0.00000000	4.49736592	-0.8136719	0.990
Hexachloroethane	AVRG		0.56259722		10.4
Indeno(1,2,3-cd)pyrene	LINR	0.00000000	0.89540087		0.997
Isophorone	AVRG		0.68046755		10.8
2-Methylnaphthalene	AVRG		0.56878244		8.0
1-Methylnaphthalene	AVRG		0.54123485		6.7
4-Methylphenol	AVRG		1.00522186		13.4
2-Methylphenol	AVRG		0.99462455		13.1
Naphthalene	AVRG		0.98375641		7.3
3-Methylphenol	AVRG		1.00522186		13.4
2-Nitroaniline	LINR	0.00000000	0.35811706		0.999
3-Nitroaniline	2ORDR	0.00000000	4.44866539	-1.3563980	0.998
4-Nitroaniline	2ORDR	0.00000000	8.00866529	-6.4581457	0.993
Nitrobenzene	AVRG		0.43191531		7.1
2-Nitrophenol	LINR	0.00000000	0.19176587		0.997
4-Nitrophenol	2ORDR	0.00000000	4.91126720	-1.3466494	0.998
N-Nitroso-di-methylamine	AVRG		0.65340336		14.5
N-Nitrosodiphenylamine	AVRG		0.60934811		7.8
N-Nitroso-di-n-propylamine	AVRG		0.89594654		9.0
Pentachlorophenol	2ORDR	0.00000000	6.90329645	-3.1011190	0.998
Phenanthrene	AVRG		1.16247419		5.6
Phenol	AVRG		1.48148989		11.4
Pyrene	AVRG		1.32053461		10.3
Pyridine	LINR	0.00000000	1.08737557		0.998
1,2,4,5-Tetrachlorobenzene	AVRG		0.37045859		5.9
1,2,4-Trichlorobenzene	AVRG		0.41016720		6.7
2,4,5-Trichlorophenol	AVRG		0.40276645		14.7

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2
2,4,6-Trichlorophenol	AVRG		0.38977244		13.8
2-Fluorophenol	AVRG		1.18919559		10.5
Phenol-d6	AVRG		1.37553797		12.9
Nitrobenzene-d5	AVRG		0.40982563		10.1
2-Fluorobiphenyl	AVRG		1.42432976		6.0
2,4,6-Tribromophenol	LINR	0.00000000	0.12450485		0.996
Terphenyl-d14	AVRG		0.98925890		6.6

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157A

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF5: CAL001A RF10: CAL002A RF20: CAL003A
RF30: CAL004A RF40: CAL005A

COMPOUND	RF5	RF10	RF20	RF30	RF40
Atrazine	0.228	0.237	0.242	0.266	0.268
Benzaldehyde	0.981	1.015	0.968	1.061	1.056
Benzidine	0.202	0.247	0.412	0.465	0.508
3,3'-Dichlorobenzidine	0.254	0.282	0.302	0.305	0.324
2,3,4,6-Tetrachlorophenol	0.130	0.137	0.176	0.229	0.232

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157A

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

LAB FILE ID: RF50: CAL006A RF60: CAL007A RF70: CAL008A
RF80: CAL009A RF90:

COMPOUND	RF50	RF60	RF70	RF80	RF90
Atrazine	0.267	0.262	0.261	0.258	
Benzaldehyde	1.043	1.034	1.013	0.998	
Benzidine	0.509	0.561	0.536	0.614	
3,3'-Dichlorobenzidine	0.324	0.338	0.330	0.340	
2,3,4,6-Tetrachlorophenol	0.237	0.247	0.248	0.260	

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157A

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

RF100: CAL010A

COMPOUND	RF100
Atrazine	0.262
Benzaldehyde	1.005
Benzidine	0.626
3,3'-Dichlorobenzidine	0.364
2,3,4,6-Tetrachlorophenol	0.270

FORM 6
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS Contract:

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: SDGA38157A

Instrument ID: BNA3 Calibration Date(s): 12/19/08 01/02/09

Column: FUSED SILICA ID: 0.25 (mm) Calibration Time(s): 1526 1505

COMPOUND	CURVE	COEFFICENTS A0	A1	A2	%RSD OR R^2
Atrazine	AVRG		0.25518178		5.5
Benzaldehyde	AVRG		1.01750995		3.0
Benzidine	2ORDR	0.00000000	2.19714466	-0.4040896	0.996
3,3'-Dichlorobenzidine	AVRG		0.31632701		9.9
2,3,4,6-Tetrachlorophenol	2ORDR	0.00000000	4.68338785	-1.5072365	0.998

Data File: \\ELABNSH05\TARGET\chem\bna3.i\010209b3cal.b\ICV01.D
Report Date: 05-Jan-2009 12:42

Empirical Laboratories, LLC

RECOVERY REPORT

Client Name:
Client SDG: SDGa38157
Sample Matrix: LIQUID
Fraction: SV
Lab Smp Id: icv50PPM
Level: LOW
Operator: ADM
Data Type: MS DATA
SampleType: LCS
SpikeList File: icvmain1.spk
Quant Type: ISTD
Sublist File: ppbna.sub
Method File: \\ELABNSH05\TARGET\chem\bna3.i\010209b3cal.b\IXBN3.m
Misc Info: ;;;;;;ppbna.sub;46

SPIKE COMPOUND	CONC ADDED SV4651	CONC RECOVERED SV4651	% RECOVERED	LIMITS
4 Pyridine	50.00	48.59	97.18	75-125
5 N-Nitroso-di-methy	50.00	47.21	94.42	75-125
8 Phenol	50.00	46.72	93.44	75-125
10 bis(2-Chloroethyl)	50.00	46.29	92.58	75-125
11 2-Chlorophenol	50.00	46.68	93.36	75-125
12 1,3-Dichlorobenzen	50.00	43.32	86.64	75-125
13 1,4-Dichlorobenzen	50.00	42.82	85.64	75-125
14 Benzyl alcohol	50.00	53.24	106.48	75-125
15 1,2-Dichlorobenzen	50.00	42.46	84.92	75-125
16 2-Methylphenol	50.00	49.32	98.64	75-125
17 bis(2-Chloroisopro	50.00	47.30	94.60	75-125
18 3-Methylphenol	50.00	53.00	106.00	75-125
19 4-Methylphenol	50.00	53.00	106.00	75-125
20 N-Nitroso-di-n-pro	50.00	42.85	85.70	75-125
21 Hexachloroethane	50.00	41.14	82.28	75-125
34 Nitrobenzene	50.00	42.44	84.88	75-125
38 Isophorone	50.00	42.50	85.00	75-125
39 2-Nitrophenol	50.00	37.66	75.32	75-125
41 2,4-Dimethylphenol	50.00	52.99	105.98	75-125
42 Benzoic acid	50.00	40.16	80.32	75-125
43 bis(2-Chloroethoxy	50.00	47.88	95.76	75-125
46 2,4-Dichlorophenol	50.00	45.54	91.08	75-125
49 1,2,4-Trichloroben	50.00	39.88	79.76	75-125
50 Naphthalene	50.00	47.42	94.84	75-125
52 Hexachlorobutadien	50.00	43.32	86.64	75-125
53 4-Chloro-3-methylp	50.00	49.42	98.84	75-125
54 2-Methylnaphthalen	50.00	48.42	96.84	75-125
69 Hexachlorocyclopen	50.00	42.12	84.24	75-125
70 2,4,6-Trichlorophe	50.00	45.10	90.20	75-125
71 2,4,5-Trichlorophe	50.00	45.54	91.08	75-125
72 2-Chloronaphthalen	50.00	46.30	92.60	75-125
74 2-Nitroaniline	50.00	40.16	80.32	75-125
75 Dimethylphthalate	50.00	41.83	83.66	75-125

Data File: \\ELABNSH05\TARGET\chem\bna3.i\010209b3cal.b\ICV01.D
Report Date: 05-Jan-2009 12:42

SPIKE COMPOUND	CONC ADDED SV4651	CONC RECOVERED SV4651	% RECOVERED	LIMITS
76 Acenaphthylene	50.00	57.76	115.52	75-125
77 2,6-Dinitrotoluene	50.00	41.32	82.64	75-125
79 Acenaphthene	50.00	46.26	92.52	75-125
80 2,4-Dinitrophenol	50.00	39.38	78.76	75-125
82 4-Nitrophenol	50.00	44.42	88.84	75-125
83 Dibenzofuran	50.00	46.56	93.12	75-125
84 2,4-Dinitrotoluene	50.00	37.76	75.52	75-125
85 Diethylphthalate	50.00	43.17	86.34	75-125
86 4-Chlorophenyl-phe	50.00	44.56	89.12	75-125
87 Fluorene	50.00	47.89	95.78	75-125
88 4-Nitroaniline	50.00	37.61	75.22	75-125
102 1,2-Diphenylhydraz	50.00	40.86	81.72	75-125
104 4,6-Dinitro-2-meth	50.00	41.28	82.56	75-125
105 N-Nitrosodiphenyla	50.00	39.40	78.80	75-125
107 4-Bromophenyl-phen	50.00	37.26	74.52	75-125
108 Hexachlorobenzene	50.00	45.25	90.50	75-125
109 Pentachlorophenol	50.00	43.35	86.70	75-125
110 Phenanthrene	50.00	45.69	91.38	75-125
111 Anthracene	50.00	46.69	93.38	75-125
114 Di-n-butylphthalat	50.00	41.51	83.02	75-125
115 Fluoranthene	50.00	46.32	92.64	75-125
133 Pyrene	50.00	46.02	92.04	75-125
135 Butylbenzylphthala	50.00	41.84	83.68	75-125
137 Benzo(a)anthracene	50.00	46.93	93.86	75-125
138 Chrysene	50.00	46.00	92.00	75-125
139 Bis(2-ethylhexyl)p	50.00	40.84	81.68	75-125
154 Di-n-octylphthalat	50.00	39.07	78.14	75-125
155 Benzo(b)fluoranthe	50.00	43.32	86.64	75-125
156 Benzo(k)fluoranthe	50.00	44.61	89.22	75-125
157 Benzo(a)pyrene	50.00	44.07	88.14	75-125
158 Indeno(1,2,3-cd)py	50.00	44.70	89.40	75-125
159 Dibenz(a,h)anthrac	50.00	46.09	92.18	75-125
160 Benzo(g,h,i)peryle	50.00	44.59	89.18	75-125

SURROGATE COMPOUND	CONC ADDED SV4651	CONC RECOVERED SV4651	% RECOVERED	LIMITS
$ 2 2-Fluorophenol	100.0	0.0000	*	15-110
$ 3 Phenol-d6	100.0	0.0000	*	15-110
$ 33 Nitrobenzene-d5	50.00	0.0000	*	30-110
$ 73 2-Fluorobiphenyl	50.00	0.0000	*	35-110
$ 106 2,4,6-Tribromophe	100.0	0.0000	*	45-125
$ 134 Terphenyl-d14	50.00	0.0000	*	55-125

FORM 7
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Instrument ID: BNA3 Calibration Date: 01/09/09 Time: 1956

Lab File ID: CCV050WL Init. Calib. Date(s): 12/19/08 01/02/09

Init. Calib. Times: 1526 1505

COMPOUND	$\overline{RRF}$	RRF50	CURVE AMOUNT	CCAL AMOUNT	MIN RRF	CURVE	%D	MAX %D
2,4-Dinitrotoluene	0.420	0.426	50.00	43.37		LINR	-13.2	20.0
2,6-Dinitrotoluene	0.345	0.319	50.00	46.26		AVRG	-7.5	20.0
2-Fluorophenol	1.189	1.207	100.0	101.5		AVRG	1.5	
Phenol-d6	1.376	1.462	100.0	106.3		AVRG	6.3	
Nitrobenzene-d5	0.410	0.378	50.00	46.17		AVRG	-7.7	
2-Fluorobiphenyl	1.424	1.365	50.00	47.93		AVRG	-4.1	
2,4,6-Tribromophenol	0.111	0.120	100.0	95.99		LINR	-4.0	
Terphenyl-d14	0.989	0.970	50.00	49.04		AVRG	-1.9	

FORM 7
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Instrument ID: BNA3 Calibration Date: 01/10/09 Time: 0910

Lab File ID: CCV050SM Init. Calib. Date(s): 12/19/08 01/02/09

Init. Calib. Times: 1526 1505

COMPOUND	$\overline{RRF}$	RRF50	CURVE AMOUNT	CCAL AMOUNT	MIN RRF	CURVE	%D	MAX %D
2,4-Dinitrotoluene	0.420	0.450	50.00	45.82		LINR	-8.4	20.0
2,6-Dinitrotoluene	0.345	0.332	50.00	48.23		AVRG	-3.5	20.0
2-Fluorophenol	1.189	1.182	100.0	99.40		AVRG	-0.6	
Phenol-d6	1.376	1.467	100.0	106.6		AVRG	6.6	
Nitrobenzene-d5	0.410	0.372	50.00	45.39		AVRG	-9.2	
2-Fluorobiphenyl	1.424	1.336	50.00	46.89		AVRG	-6.2	
2,4,6-Tribromophenol	0.111	0.121	100.0	96.89		LINR	-3.1	
Terphenyl-d14	0.989	0.977	50.00	49.39		AVRG	-1.2	

FORM 7
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: EMPIRICAL LABS Contract: ARCADIS-RADFORD

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: ARC.B12363

Instrument ID: BNA3 Calibration Date: 01/10/09 Time: 2306

Lab File ID: CCV050SN Init. Calib. Date(s): 12/19/08 01/02/09

Init. Calib. Times: 1526 1505

COMPOUND	$\overline{RRF}$	RRF50	CURVE AMOUNT	CCAL AMOUNT	MIN RRF	CURVE	%D	MAX %D
2,4-Dinitrotoluene	0.420	0.443	50.00	45.13		LINR	-9.7	20.0
2,6-Dinitrotoluene	0.345	0.332	50.00	48.21		AVRG	-3.6	20.0
2-Fluorophenol	1.189	1.184	100.0	99.55		AVRG	-0.4	
Phenol-d6	1.376	1.452	100.0	105.5		AVRG	5.5	
Nitrobenzene-d5	0.410	0.374	50.00	45.70		AVRG	-8.6	
2-Fluorobiphenyl	1.424	1.350	50.00	47.39		AVRG	-5.2	
2,4,6-Tribromophenol	0.111	0.120	100.0	96.45		LINR	-3.5	
Terphenyl-d14	0.989	0.963	50.00	48.67		AVRG	-2.7	

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB00
3A (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 012F1201

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 08:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/05/09 18:41

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	5.3	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.

A31-SB00
3A (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 013F1301

% Moisture: 24 decanted: (Y/N) N Date Sampled: 12/30/08 11:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/05/09 18:59

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	5.5	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		U
11096-82-5	PCB-1260	5.5	22		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB00
4A (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-03

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 014F1401

% Moisture: 18 decanted: (Y/N) N Date Sampled: 12/30/08 08:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/05/09 19:18

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.

A31-SB00
4A (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-04

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 015F1501

% Moisture: 18 decanted: (Y/N) N Date Sampled: 12/30/08 10:10

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/05/09 19:36

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	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.

A31-SB011 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-05

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 026F2601

% Moisture: 19 decanted: (Y/N) N Date Sampled: 12/30/08 09:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/05/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 20:10

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.

A31-SB012 (1-2)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-06

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 016F1601

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 11:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/05/09 19:54

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.

A31-SB012 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-07

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 017F1701

% Moisture: 26 decanted: (Y/N) N Date Sampled: 12/30/08 11:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/05/09 20:13

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.

A31-SB013 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 005F0501

% Moisture: 19 decanted: (Y/N) N Date Sampled: 12/30/08 09:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 13:43

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.

A31-SB013 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-09

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 006F0601

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 14:02

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	5.3	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.

A31-SB014 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 007F0701

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 08:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 14:20

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.

A31-SB014 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 008F0801

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 10:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 14:39

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/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.

A31-SB015 (2-3)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-12

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 009F0901

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 11:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 14:57

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	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.

A31-SB015 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-13

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 012F1201

% Moisture: 19 decanted: (Y/N) N Date Sampled: 12/30/08 11:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 15:52

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.

A31-SB016 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-14

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 013F1301

% Moisture: 20 decanted: (Y/N) N Date Sampled: 12/30/08 09:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 16:11

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	5.2	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.

A31-SB016 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-15

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 014F1401

% Moisture: 20 decanted: (Y/N) N Date Sampled: 12/30/08 12:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 16:29

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.

A31-SB017 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-16

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 018F1801

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 08:45

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 17:43

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.

A31-SB017 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-17

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 019F1901

% Moisture: 19 decanted: (Y/N) N Date Sampled: 12/30/08 10:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 18:01

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.

A31-SB018 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-18

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 020F2001

% Moisture: 28 decanted: (Y/N) N Date Sampled: 12/30/08 08:55

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 18:20

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	5.7	23		U
11104-28-2	PCB-1221	5.7	23		U
11141-16-5	PCB-1232	5.7	23		U
53469-21-9	PCB-1242	5.7	23		U
12672-29-6	PCB-1248	5.7	23		U
11097-69-1	PCB-1254	5.7	23		U
11096-82-5	PCB-1260	5.7	23		U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

A31-SB018 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-19

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 021F2101

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 09:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 18:38

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	5.3	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.

A31-SB019 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-20

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 022F2201

% Moisture: 21 decanted: (Y/N) N Date Sampled: 12/30/08 08:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 18:56

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	5.3	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.

A31-SB019 (5-6)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-21

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 023F2301

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 09:35

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 19:15

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG 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.

A31-SBDUP
002 (0-1)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: 0812363-22

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 029F2901

% Moisture: 22 decanted: (Y/N) N Date Sampled: 12/30/08 12:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/05/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 21:05

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.

A31-EB001
(123008)

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) WATER Lab Sample ID: 0812363-23

Sample wt/vol: 1020 (g/mL) ML Lab File ID: 009F0901

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 12/30/08 15:00

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:01/02/09

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 01/05/09 17:46

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	0.49		U
11104-28-2	PCB-1221	0.12	0.49		U
11141-16-5	PCB-1232	0.12	0.49		U
53469-21-9	PCB-1242	0.12	0.49		U
12672-29-6	PCB-1248	0.12	0.49		U
11097-69-1	PCB-1254	0.12	0.49		U
11096-82-5	PCB-1260	0.12	0.49		U

FORM 2
SOIL PCB SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

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	PS1BLK0102	72	75	65	68			0
02	PS1BLK0102LC	76	80	68	72			0
03	A31-SB003A (	68	72	63	66			0
04	A31-SB003A (	64	69	65	69			0
05	A31-SB004A (	78	81	72	75			0
06	A31-SB004A (	66	69	62	65			0
07	A31-SB012 (1	69	72	60	63			0
08	A31-SB012 (5	80	83	76	81			0
09	A31-SB013 (0	88	87	80	94			0
10	A31-SB013 (5	72	79	60	64			0
11	A31-SB014 (0	84	88	67	74			0
12	A31-SB014 (5	89	95	74	82			0
13	A31-SB015 (2	86	91	76	84			0
14	A31-SB015 (2	71	80	67	75			0
15	A31-SB015 (5	61	67	49	54			0
16	A31-SB016 (0	81	86	76	85			0
17	A31-SB016 (5	75	80	70	79			0
18	A31-SB017 (0	85	92	80	76			0
19	A31-SB017 (5	89	95	87	94			0
20	A31-SB018 (0	93	98	89	101			0
21	A31-SB018 (5	73	78	65	64			0
22	A31-SB019 (0	78	82	63	64			0
23	A31-SB019 (5	97	101	85	93			0
24	PS1BLK0105	100	106	92	98			0
25	PS1BLK0105LC	101	111	96	108			0
26	A31-SB011 (0	106	110	87	90			0
27	A31-SB011 (0	110	115	90	92			0
28	A31-SB011 (0	105	110	83	85			0
29	A31-SBDUP002	106	112	81	85			0
30	A31-SB015 (2	95	87	73	83			0

		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.: ARC.P12363

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	PW1BLK0102	88		91		77		79				0
02	PW1BLK0102LC	95		100		82		87				0
03	PW1BLK0102LC	92		95		75		79				0
04	A31-EB001 (1	95		97		68		71				0
05												
06												
07												
08												
09												
10												
11												
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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
WATER PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix Spike - Client Sample No.: PW1BLK0102

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
PCB-1016	5.000	0.0000	5.298	106	30-140
PCB-1260	5.000	0.0000	4.670	93	40-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	5.000	5.205	104	2	30	30-140
PCB-1260	5.000	4.632	93	1	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 LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix Spike - Client Sample No.: PS1BLK0102

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PCB-1016	166.7	0.0000	133.5	80	45-120
PCB-1260	166.7	0.0000	130.0	78	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
SOIL PCB LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix Spike - Client Sample No.: PS1BLK0105

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
PCB-1016	166.7	0.0000	179.1	107	45-120
PCB-1260	166.7	0.0000	163.5	98	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
SOIL PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix Spike - Client Sample No.: A31-SB011 (0-1) Lab Sample ID: 0812363-05

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
PCB-1016	204.8	0.0000	238.9	117	45-120
PCB-1260	204.8	0.0000	238.0	116	40-125

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	204.8	226.6	111	5	50	45-120
PCB-1260	204.8	219.1	107	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 3
SOIL PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix Spike - Client Sample No.: A31-SB015 (2-3) Lab Sample ID: 0812363-12

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
PCB-1016	204.8	0.0000	196.8	96	45-120
PCB-1260	204.8	0.0000	167.5	82	40-125

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
PCB-1016	209.6	162.3	77	19	50	45-120
PCB-1260	209.6	154.6	74	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.

PW1BLK0102

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Lab Sample ID: PW1BLK0102 Lab File ID: 005F0501

Matrix (soil/water) WATER Extraction: (SepF/Cont/Sonc/Soxh) SEPF

Sulfur Cleanup (Y/N) Y Date Extracted: 01/02/09

Date Analyzed (1): 01/05/09 Date Analyzed (2): 01/05/09

Time Analyzed (1): 1633 Time Analyzed (2): 1633

Instrument ID (1): ECD4 Instrument ID (2): ECD4

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	PW1BLK0102LC	PW1BLK0102LCS	01/05/09	01/05/09
02	PW1BLK0102LC	PW1BLK0102LCSD	01/05/09	01/05/09
03	A31-EB001 (1	0812363-23	01/05/09	01/05/09
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
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18				
19				
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21				
22				
23				
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25				
26				

COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PW1BLK0102

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) WATER Lab Sample ID: PW1BLK0102

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 005F0501

% Moisture: _____ decanted: (Y/N)___ Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:01/02/09

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 01/05/09 16:33

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/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 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PS1BLK0102

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Lab Sample ID: PS1BLK0102 Lab File ID: 010F1001

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SOXH

Sulfur Cleanup (Y/N) Y Date Extracted: 01/02/09

Date Analyzed (1): 01/05/09 Date Analyzed (2): 01/05/09

Time Analyzed (1): 1805 Time Analyzed (2): 1805

Instrument ID (1): ECD4 Instrument ID (2): ECD4

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	PS1BLK0102LC	PS1BLK0102LCS	01/05/09	01/05/09
02	A31-SB003A (	0812363-01	01/05/09	01/05/09
03	A31-SB003A (	0812363-02	01/05/09	01/05/09
04	A31-SB004A (	0812363-03	01/05/09	01/05/09
05	A31-SB004A (	0812363-04	01/05/09	01/05/09
06	A31-SB012 (1	0812363-06	01/05/09	01/05/09
07	A31-SB012 (5	0812363-07	01/05/09	01/05/09
08	A31-SB013 (0	0812363-08	01/06/09	01/06/09
09	A31-SB013 (5	0812363-09	01/06/09	01/06/09
10	A31-SB014 (0	0812363-10	01/06/09	01/06/09
11	A31-SB014 (5	0812363-11	01/06/09	01/06/09
12	A31-SB015 (2	0812363-12	01/06/09	01/06/09
13	A31-SB015 (2	0812363-12MSD	01/06/09	01/06/09
14	A31-SB015 (5	0812363-13	01/06/09	01/06/09
15	A31-SB016 (0	0812363-14	01/06/09	01/06/09
16	A31-SB016 (5	0812363-15	01/06/09	01/06/09
17	A31-SB017 (0	0812363-16	01/06/09	01/06/09
18	A31-SB017 (5	0812363-17	01/06/09	01/06/09
19	A31-SB018 (0	0812363-18	01/06/09	01/06/09
20	A31-SB018 (5	0812363-19	01/06/09	01/06/09
21	A31-SB019 (0	0812363-20	01/06/09	01/06/09
22	A31-SB019 (5	0812363-21	01/06/09	01/06/09
23				
24				
25				
26				

COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PS1BLK0102

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: PS1BLK0102

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 010F1001

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/02/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/05/09 18:05

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.

PS1BLK0105

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Lab Sample ID: PS1BLK0105 Lab File ID: 024F2401

Matrix (soil/water) SOIL Extraction: (SepF/Cont/Sonc/Soxh) SOXH

Sulfur Cleanup (Y/N) Y Date Extracted: 01/05/09

Date Analyzed (1): 01/06/09 Date Analyzed (2): 01/06/09

Time Analyzed (1): 1933 Time Analyzed (2): 1933

Instrument ID (1): ECD4 Instrument ID (2): ECD4

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	PS1BLK0105LC	PS1BLK0105LCS	01/06/09	01/06/09
02	A31-SB011 (0	0812363-05	01/06/09	01/06/09
03	A31-SB011 (0	0812363-05MS	01/06/09	01/06/09
04	A31-SB011 (0	0812363-05MSD	01/06/09	01/06/09
05	A31-SBDUP002	0812363-22	01/06/09	01/06/09
06	A31-SB015 (2	0812363-12MS	01/07/09	01/07/09
07				
08				
09				
10				
11				
12				
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COMMENTS: _____

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PS1BLK0105

Lab Name: EMPIRICAL LABS Contract: ARCADIS

Lab Code: Case No.: SAS No.: NA SDG No.: ARC.P12363

Matrix: (soil/water) SOIL Lab Sample ID: PS1BLK0105

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 024F2401

% Moisture: 0 decanted: (Y/N) N Date Sampled: _____

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:01/05/09

Concentrated Extract Volume: 5.0(mL) Date Analyzed: 01/06/09 19:33

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	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

Appendix D

Analytical Data

Appendix D. Summary of Soil Sample Analytical Results RAAP-031

Location ID: Sample Depth(Feet): Date Collected:	Units	ASB1 0 - 1 10/11/03	ASB1 10 - 12 10/11/03	ASB1 26 - 28 10/11/03	ASB2 0 - 1 10/11/03	ASB2 10 - 12 10/11/03	ASB2 21 - 23 10/11/03	ASB3 0 - 1 10/11/03	ASB3 0 - 1 06/30/08	ASB3 6 - 8 10/11/03	ASB3 13 - 14.7 10/11/03	A31-SB003A 0 - 1 12/30/08	A31-SB003A 5 - 6 12/30/08	ASB4 0 - 1 04/20/06	ASB4 10 - 11 04/20/06	ASB4 20 04/20/06
Volatile Organics																
Acetone	mg/kg	0.015 J,B	0.019 J,B	0.029 ,B	0.016 J,B	0.023 J,B [0.024 J,B]	0.023 J,B	0.012 J,B	NA	0.019 J,B	0.018 J,B	NA	NA	0.38 J,B [0.38 J,B]	0.39 J,B	0.46 J,B
Benzene	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA	0.013 J [<0.065]	<0.064	<0.075
Ethylbenzene	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA	0.015 J [<0.065]	<0.064	<0.075
Methyl acetate	mg/kg	<0.024	<0.026	<0.026 ,J	<0.025	<0.026 [<0.028]	<0.027	<0.025	NA	<0.025	<0.024	NA	NA	0.085 J [0.089 J]	0.19 J	0.081 J
Methylene Chloride	mg/kg	0.0049 J	0.0059 J	0.0066 J,B	0.0045 J	0.0077 J [0.0070 J]	0.011 J	0.0053 J	NA	0.0066 J	0.0037 J	NA	NA	0.094 JB,B [0.097 JB,B]	0.099 JB,B	0.11 JB,B
Toluene	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA	0.081 [<0.065]	<0.064	<0.075
Xylenes (total)	mg/kg	<0.0061	<0.0064	<0.0065	<0.0062	<0.0066 [<0.0069]	<0.0068	<0.0062	NA	<0.0062	<0.0060	NA	NA	0.10 J [<0.19]	<0.19	<0.22
Semivolatile Organics																
1,1'-Biphenyl	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
1,2,4,5-Tetrachlorobenzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<1.5 J	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<1.5	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	0.85 J	<0.22	<0.22	<1.0	<0.22 [<0.22]	<0.23	28 J	98	0.023 J	<0.20	<0.42 J	<0.44 J	<0.044 [<0.044]	<0.044	<0.051
2,6-Dinitrotoluene	mg/kg	0.082 J	<0.22	<0.22	0.10 J	<0.22 [<0.22]	<0.23	3.3 E,J	4.6 J	<0.21	<0.20	<0.42	<0.44	<0.022 [<0.022]	<0.022	<0.025
2-Chloronaphthalene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
2-Methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	<1.5	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38 J	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	<1.5 J	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<1.5	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-Methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38 J	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	<1.5	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<1.5 J	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Acenaphthylene	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Acetophenone	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Atrazine	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38 J	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	mg/kg	NA	NA	NA	NA	NA	NA	NA	R	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.15	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Benzo(a)pyrene	mg/kg	0.0090 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	0.010 J,J	<0.15	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Benzo(b)fluoranthene	mg/kg	0.016 J,J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21 ,J	<0.15	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Benzo(g,h,i)perylene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21 ,J	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
bis(2-Chloroethoxy)methane	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroisopropyl)ether	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	mg/kg	1.4	0.022 J	0.017 J	0.11 J	0.022 J [0.016 J]	0.034 J	1.2 E,J	3.4	0.020 J	0.022 J	NA	NA	0.16 ,J [0.31 ,J]	0.42	0.038 J
Butylbenzylphthalate	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	0.0090 J	0.24	<0.38	<0.21	<0.20	NA	NA	<0.087 [<0.088]	<0.087	<0.10
Caprolactam	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Carbazole	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38 J	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/kg	0.015 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	0.057 J	<0.21	0.20 J	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Dibenzo(a,h)anthracene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.15	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	mg/kg	0.014 J	0.0080 J	0.010 J	0.010 J	0.010 J [<0.22]	0.0080 J	0.014 J	0.16 J	0.010 J	0.0080 J	NA	NA	0.026 [0.0068 J]	0.0084 J	0.0077 J
Dimethylphthalate	mg/kg	0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Di-n-Butylphthalate	mg/kg	5.1	0.093 J	0.13 J	4.3	0.59 [0.64]	0.60	130	410 J	0.32	0.32	NA	NA	0.15 [0.10]	0.47	0.0098 J
Dinitrotoluene Mix	mg/kg	0.93 J	<0.22	<0.22	0.10 J	<0.22 [<0.22]	<0.23	31 J	100 J	0.023 J	<0.20	<0.42	<0.44	<0.044 [<0.044]	<0.044	<0.051
Di-n-Octylphthalate	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	0.038 J	<0.38	<0.21	<0.20	NA	NA	0.014 J [0.012 J]	0.013 J	<0.025
Fluoranthene	mg/kg	0.030 J	<0.22	<0.22	0.0030 J	<0.22 [<0.22]	<0.23	0.0088 J	<0.38	<0.21	0.20 J	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Fluorene	mg/kg	<0.21	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21	<0.38	<0.21	<0.20	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Hexachlorobenzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38 J	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	0.0060 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	<0.21 J,J	<0.15	<0.21	<0.20	NA	NA	<0.087 [<0.088]	<0.087	<0.10

Appendix D. Summary of Soil Sample Analytical Results RAAP-031

Location ID: Sample Depth(Feet): Date Collected:	Units	ASB1 0 - 1 10/11/03	ASB1 10 - 12 10/11/03	ASB1 26 - 28 10/11/03	ASB2 0 - 1 10/11/03	ASB2 10 - 12 10/11/03	ASB2 21 - 23 10/11/03	ASB3 0 - 1 10/11/03	ASB3 0 - 1 06/30/08	ASB3 6 - 8 10/11/03	ASB3 13 - 14.7 10/11/03	A31-SB003A 0 - 1 12/30/08	A31-SB003A 5 - 6 12/30/08	ASB4 0 - 1 04/20/06	ASB4 10 - 11 04/20/06	ASB4 20 04/20/06
Isophorone	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	1.0	<0.22	<0.22	0.12 J	<0.22 [<0.22]	<0.23	4.7 J	22 J	0.0080 J	<0.20	NA	NA	1.0 ,J [0.34 ,J]	0.15	<0.025
Pentachlorophenol	mg/kg	<0.40	<0.42	<0.43	<0.41	<0.43 [<0.43]	<0.45	<0.41	<1.5	<0.41	<0.39	NA	NA	<0.044 [<0.044]	<0.044	<0.051
Phenanthrene	mg/kg	0.011 J	<0.22	<0.22	<0.21	<0.22 [<0.22]	<0.23	0.0038 J	NA	<0.21	0.20 J	NA	NA	<0.022 [<0.022]	<0.022	<0.025
Phenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.38	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/kg	0.026 J	<0.22	<0.22	0.0030 J	<0.22 [<0.22]	<0.23	0.0067 J	<0.38	<0.21	0.20 J	NA	NA	<0.022 [<0.022]	<0.022	<0.025
PAHs																
Benzo(a)anthracene	mg/kg	<0.026	<0.027	<0.027	0.0036 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	<0.025	NA	NA	NA	NA	NA
Chrysene	mg/kg	0.0050 J	<0.027	<0.027	0.0037 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	0.0018 J	NA	NA	NA	NA	NA
Fluoranthene	mg/kg	0.017 J,J	<0.027	<0.027	0.0077 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	0.0087 J	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	<0.026	<0.027	<0.027	0.0062 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	<0.025	NA	NA	NA	NA	NA
Phenanthrene	mg/kg	0.0031 J	<0.027	<0.027	0.0040 J	<0.028 [<0.029]	<0.065	0.0019 J	NA	<0.026 ,L	0.0030 J	NA	NA	NA	NA	NA
Pyrene	mg/kg	0.011 J	<0.027	<0.027	0.021 J	<0.028 [<0.029]	<0.065	<0.026	NA	<0.026 ,L	0.0099 J	NA	NA	NA	NA	NA
Organochlorine Pesticides																
Dieldrin	mg/kg	NA	NA	NA	<0.025	NA	NA	NA	NA	NA	NA	NA	NA	0.014 J,J [0.0032 J,J]	0.0046 J,J	<0.03
PCBs																
Aroclor-1016	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.019	NA	NA	<0.021	<0.022	NA	NA	NA
Aroclor-1221	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.019	NA	NA	<0.021	<0.022	NA	NA	NA
Aroclor-1232	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.019	NA	NA	<0.021	<0.022	NA	NA	NA
Aroclor-1242	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.019	NA	NA	<0.021	<0.022	NA	NA	NA
Aroclor-1248	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.019	NA	NA	<0.021	<0.022	NA	NA	NA
Aroclor-1254	mg/kg	NA	NA	NA	0.0099 J	NA	NA	NA	2.4 J	NA	NA	<0.021	<0.022	0.00014 [0.030 J]	0.041 J	<0.049
Aroclor-1260	mg/kg	NA	NA	NA	NA	NA	NA	NA	<0.019	NA	NA	<0.021	<0.022	NA	NA	NA
Explosives																
2,4-Dinitrotoluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5 [<0.5]	0.2 J	20	NA	<0.5	<0.5	NA	NA	<0.5 [<0.5]	<0.5	<0.5
2,6-Dinitrotoluene	mg/kg	<1	<1	<1	<1	<1 [<1]	<1	<1	NA	<1	<1	NA	NA	<1 [<1]	<1	<1
Dinitrotoluene Mix	mg/kg	<1	<1	<1	<1	<1 [<1]	0.2 J	20	NA	<1	<1	NA	NA	<1 [<1]	<1	<1
Inorganics																
Aluminum	mg/kg	32,000	30,800	36,300	28,500	32,300 [34,800]	35,000	32,100	26,100	28,300	24,500	NA	NA	33,000 ,J [28,000 ,J]	26,000 ,J	27,000 ,J
Antimony	mg/kg	0.0860 J	<0.500	0.180 J	0.0710 J	<0.500 [0.0680 J]	<0.500	<0.500	<3.40	<0.500	<0.500	NA	NA	0.100 J,J [0.240 J,J]	<0.500 ,J	0.140 J,J
Arsenic	mg/kg	3.00	1.80	8.10	2.90	3.40 [4.70]	4.50	1.90	4.90	1.60	2.20	NA	NA	2.00 ,J [1.70 ,J]	1.60 ,J	4.20 ,J
Barium	mg/kg	86.0	99.0	115	61.0	77.0 [98.0]	88.0	114	203	63.0	50.0	NA	NA	67.0 ,J [57.0 ,J]	50.0 ,J	86.0 ,J
Beryllium	mg/kg	0.530 J	0.900 J	1.80	0.550 J	1.30 [0.860 J]	0.590 J	0.620 J	0.900 J	0.570 J	0.640 J	NA	NA	0.550 J,J [0.640 J,J]	0.590 J,J	1.10 ,J
Cadmium	mg/kg	0.940 J	<1.00	0.460 J	0.260 J	0.360 J [<1.00]	<1.00	<1.00	0.470 J	0.750 J	<1.00	NA	NA	0.0760 J,J [0.170 J,J]	0.0360 J,J	0.150 J,J
Calcium	mg/kg	2,570	408	126 J	6,100	867 [380]	310	3,910	15,900	644	293	NA	NA	2,200 ,J [2,100 ,J]	710 ,J	320 ,J
Chromium	mg/kg	38.0 ,J	31.0 ,J	40.0 ,J	36.0 ,J	39.0 ,J [41.0 ,J]	52.0 ,J	33.0 ,J	44.7	30.0 ,J	41.0 ,J	NA	NA	29.0 ,J [43.0 ,J]	28.0 ,J	21.0 ,J
Cobalt	mg/kg	8.80 ,J	24.0 ,J	15.0 ,J	9.30 ,J	14.0 ,J [22.0 ,J]	20.0 ,J	24.0 ,J	9.90	12.0 ,J	11.0 ,J	NA	NA	6.20 ,J [6.20 ,J]	6.30 ,J	33.0 ,J
Copper	mg/kg	155	20.0	43.0	57.0	19.0 [23.0]	22.0	36.0	245	17.0	14.0	NA	NA	460 ,J [560 ,J]	15.0 ,J	30.0 ,J
Cyanide	mg/kg	0.0600 J	<0.500	0.470 J	0.230 J	0.180 J [0.140 J]	<0.500	0.150 J	NA	<0.500	<0.500	NA	NA	<0.260 [<0.260]	<0.260	0.720
Iron	mg/kg	41,600	37,500	42,200	38,100	40,300 [38,000]	40,200	38,300	49,500	36,500	33,600	NA	NA	40,000 ,J [66,000 ,J]	33,000 ,J	55,000 ,J
Lead	mg/kg	76.0	26.0	19.0	25.0	8.80 ,J [13.0 ,J]	12.0	34.0	170	11.0	12.0	NA	NA	30.0 ,J [34.0 ,J]	13.0 ,J	25.0 ,J
Magnesium	mg/kg	2,450	2,050	5,870	3,180	5,220 ,J [2,800 ,J]	2,120	2,090	7,190	1,980	1,160	NA	NA	2,600 ,J [2,400 ,J]	1,300 ,J	3,900 ,J
Manganese	mg/kg	315	1,750	1,170	426	648 [859]	704	2,400	397	483	330	NA	NA	290 ,J [350 ,J]	260 ,J	1,700 ,J
Mercury	mg/kg	0.0670 J	0.0190 J	0.0750 J	0.0450 J	0.0140 J [0.0220 J]	0.0200 J	0.0520 J	0.0970	0.0300 J	0.0250 J	NA	NA	0.0410 J,J [0.0350 J,J]	0.0330 J,J	0.0250 J,J
Nickel	mg/kg	13.0	16.0	28.0	13.0	36.0 ,J [21.0 ,J]	20.0	12.0	20.1	13.0	14.0	NA	NA	16.0 ,J [13.0 ,J]	12.0 ,J	32.0 ,J
Potassium	mg/kg	1,540	1,840	3,780	1,220	2,750 ,J [1,560 ,J]	1,260	1,410	1,540	1,670	1,010	NA	NA	1,600 ,J [1,500 ,J]	1,200 ,J	2,600 ,J
Selenium	mg/kg	0.560 J	0.520 J	0.990 J	0.470 J	0.600 J [0.500 J]	0.450 J	0.300 J	<1.80	0.400 J	0.400 J	NA	NA	<1.00 ,J [0.0700 J,J]	0.0700 J,J	0.100 J,J
Silver	mg/kg	0.0700 J	0.0610 J	0.110 J	0.0720 J	0.0930 J [0.0940 J]	0.0750 J	0.0540 J	<2.30	0.0480 J	0.0740 J	NA	NA	0.100 J,J [0.0650 J,J]	0.0450 J,J	0.190 J,J
Sodium	mg/kg	95.0 J	122	54.0 J	77.0 J	77.0 J [50.0 J]	50.0 J	207	<1,150	237	131	NA	NA	120 ,J [49.0 J,J]	330 ,J	<100 ,J
Thallium	mg/kg	0.240 J,B	0.430 J	0.450 J	0.230 J,B	0.230 J,B [0.220 J,B]	0.210 J,B	0.480 J	<2.30	0.200 J,B	0.150 J,B	NA	NA	0.320 J,J [0.240 J,J]	0.190 J,J	0.370 J,J
Vanadium	mg/kg	68.0 ,L	66.0 ,L	56.0 ,L	63.0 ,L	55.0 ,L [49.0 ,L]	54.0 ,L	68.0 ,L	66.5	66.0 ,L	42.0 ,L	NA	NA	91.0 ,J [75.0 ,J]	71.0 ,J	77.0 ,J
Zinc	mg/kg	78.0	56.0	109	58.0	45.0 [37.0]	40.0	56.0	313	46.0	44.0	NA	NA	76.0 ,J [140 ,J]	47.0 ,J	37.0 ,J

Notes:

(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
Results in brackets [##] represent duplicate sample concentrations.
NA - parameter not analyzed
J - concentration is estimated
B - compound also detected in associated blank

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

Appendix D. Summary of Soil Sample Analytical Results RAAP-031

Location ID: Sample Depth(Feet): Date Collected:	Units	A31-SB004A 0 - 1 12/30/08	A31-SB004A 5 - 6 12/30/08	ASB5 0 - 1 04/20/06	ASB5 0 - 1 06/30/08	ASB5 7 04/20/06	ASB6 0 - 1 06/30/08	ASB6 5 - 6 06/30/08	ASB7 0 - 1 06/30/08	ASB7 5 - 6 06/30/08	ASB8 0 - 1 06/30/08	ASB8 5 - 6 06/30/08	ASB9 0 - 1 06/30/08	ASB9 5 - 6 06/30/08	ASB10 0 - 1 06/30/08	ASB10 5 - 6 06/30/08	A31-SB011 0 - 1 12/30/08	A31-SB012 1 - 2 12/30/08	A31-SB012 5 - 6 12/30/08
Volatile Organics																			
Acetone	mg/kg	NA	NA	0.42 J,B	NA	0.37 J,B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	mg/kg	NA	NA	<0.063	NA	<0.068	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	mg/kg	NA	NA	<0.063	NA	<0.068	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	NA	NA	0.14 J	NA	0.076 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	NA	NA	0.094 JB,B	NA	0.10 JB,B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	mg/kg	NA	NA	<0.063	NA	<0.068	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	mg/kg	NA	NA	<0.19	NA	<0.21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organics																			
1,1'-Biphenyl	mg/kg	NA	NA	0.0022 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2,4-Dichlorophenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2,4-Dimethylphenol	mg/kg	NA	NA	NA	<1.7 J [<1.8 J]	NA	<1.6	<1.6 J	<1.5 J	<2.0 J	<1.8 J	<1.9 J	<1.8 J	<1.7 J	<1.7 J	<1.8 J	NA	NA	NA
2,4-Dinitrophenol	mg/kg	NA	NA	NA	<1.7 [<1.8]	NA	<1.6	<1.6	<1.5	<2.0	<1.8	<1.9	<1.8	<1.7	<1.7	<1.8	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	<0.41 J	<0.40 J	11	2.8 J [7.3 J]	<0.047	<0.41	<0.40	0.31 J	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	<0.42 J	<0.45 J
2,6-Dinitrotoluene	mg/kg	<0.41	<0.40	0.49	0.17 J [0.43 J]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	<0.42	<0.45
2-Chloronaphthalene	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2-Chlorophenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2-Methylnaphthalene	mg/kg	NA	NA	0.0049 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2-Methylphenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
2-Nitroaniline	mg/kg	NA	NA	NA	<1.7 [<1.8]	NA	<1.6	<1.6	<1.5	<2.0	<1.8	<1.9	<1.8	<1.7	<1.7	<1.8	NA	NA	NA
2-Nitrophenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	NA	NA	NA	<0.44 J [<0.45 J]	NA	<0.41 Y	<0.40 J	<0.38 J	<0.50 J	<0.45 J	<0.49 J	<0.45 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA
3-Nitroaniline	mg/kg	NA	NA	NA	<1.7 J [<1.8 J]	NA	<1.6	<1.6 J	<1.5 J	<2.0 J	<1.8 J	<1.9 J	<1.8 J	<1.7 J	<1.7 J	<1.8 J	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	NA	NA	NA	<1.7 [<1.8]	NA	<1.6	<1.6	<1.5	<2.0	<1.8	<1.9	<1.8	<1.7	<1.7	<1.8	NA	NA	NA
4-Bromophenyl-phenylether	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
4-Chloro-3-Methylphenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
4-Chloroaniline	mg/kg	NA	NA	NA	<0.44 J [<0.45 J]	NA	<0.41	<0.40 J	<0.38 J	<0.50 J	<0.45 J	<0.49 J	<0.45 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA
4-Chlorophenyl-phenylether	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
4-Methylphenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
4-Nitroaniline	mg/kg	NA	NA	NA	<1.7 [<1.8]	NA	<1.6	<1.6	<1.5	<2.0	<1.8	<1.9	<1.8	<1.7	<1.7	<1.8	NA	NA	NA
4-Nitrophenol	mg/kg	NA	NA	NA	<1.7 J [<1.8 J]	NA	<1.6 Y	<1.6 J	<1.5 J	<2.0 J	<1.8 J	<1.9 J	<1.8 J	<1.7 J	<1.7 J	<1.8 J	NA	NA	NA
Acenaphthene	mg/kg	NA	NA	0.0066 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Acenaphthylene	mg/kg	NA	NA	0.021 J	<0.44 [0.057 J]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Acetophenone	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Anthracene	mg/kg	NA	NA	0.021 J	<0.44 [0.064 J]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Atrazine	mg/kg	NA	NA	NA	<0.44 J [<0.45 J]	NA	<0.41 Y	<0.40 J	<0.38 J	<0.50 J	<0.45 J	<0.49 J	<0.45 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA
Benzaldehyde	mg/kg	NA	NA	NA	R [R]	NA	R	R	R	R	R	R	R	R	R	R	NA	NA	NA
Benzo(a)anthracene	mg/kg	NA	NA	0.072	<0.17 J [0.45 J]	<0.023	<0.16	<0.16	<0.15	<0.20	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA
Benzo(a)pyrene	mg/kg	NA	NA	0.022	<0.17 J [0.38 J]	<0.023	<0.16	<0.16	<0.15	<0.20	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA
Benzo(b)fluoranthene	mg/kg	NA	NA	0.12	<0.17 J [0.48 J]	<0.023	<0.16	<0.16	<0.15	<0.20	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA
Benzo(g,h,i)perylene	mg/kg	NA	NA	NA	<0.44 [0.28 J]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Benzo(k)fluoranthene	mg/kg	NA	NA	0.036	<0.44 [0.38 J]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
bis(2-Chloroethoxy)methane	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
bis(2-Chloroethyl)ether	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
bis(2-Chloroisopropyl)ether	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
bis(2-Ethylhexyl)phthalate	mg/kg	NA	NA	5.7	0.90 J [2.5 J]	0.13	<0.41	<0.40	1.0	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Butylbenzylphthalate	mg/kg	NA	NA	0.16	<0.44 [<0.45]	<0.093	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Caprolactam	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Carbazole	mg/kg	NA	NA	NA	<0.44 J [0.077 J]	NA	<0.41	<0.40 J	<0.38 J	<0.50 J	<0.45 J	<0.49 J	<0.45 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA
Chrysene	mg/kg	NA	NA	0.087	0.042 J [0.66]	<0.023	<0.41	<0.40	0.041 J	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Dibenzo(a,h)anthracene	mg/kg	NA	NA	NA	<0.17 [0.29]	NA	<0.16	<0.16	<0.15	<0.20	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA
Dibenzofuran	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Diethylphthalate	mg/kg	NA	NA	0.024	<0.44 [<0.45]	0.0039 J	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Dimethylphthalate	mg/kg	NA	NA	0.21	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Di-n-Butylphthalate	mg/kg	NA	NA	62	15 J [68 J]	0.089	0.060 J	<0.40 J	2.7 J	<0.50 J	<0.45 J	<0.49 J	0.12 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA
Dinitrotoluene Mix	mg/kg	<0.41	<0.40	12	3.0 J [7.7 J]	<0.047	<0.41	<0.40	0.31 J	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	<0.42	<0.45
Di-n-Octylphthalate	mg/kg	NA	NA	0.055	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Fluoranthene	mg/kg	NA	NA	0.43	<0.44 J [1.3 J]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Fluorene	mg/kg	NA	NA	0.014 J	<0.44 [<0.45]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Hexachlorobenzene	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Hexachlorobutadiene	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	NA	NA	NA	<0.44 J [<0.45 J]	NA	<0.41	<0.40 J	<0.38 J	<0.50 J	<0.45 J	<0.49 J	<0.45 J	<0.43 J	<0.43 J	<0.44 J	NA	NA	NA
Hexachloroethane	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	NA	NA	<0.086	<0.17 [0.39]	<0.093	<0.16	<0.16	<0.15	<0.20	<0.18	<0.19	<0.18	<0.17	<0.17	<0.18	NA	NA	NA

Appendix D. Summary of Soil Sample Analytical Results RAAP-031

Location ID: Sample Depth(Feet): Date Collected:	Units	A31-SB004A 0 - 1 12/30/08	A31-SB004A 5 - 6 12/30/08	ASB5 0 - 1 04/20/06	ASB5 0 - 1 06/30/08	ASB5 7 04/20/06	ASB6 0 - 1 06/30/08	ASB6 5 - 6 06/30/08	ASB7 0 - 1 06/30/08	ASB7 5 - 6 06/30/08	ASB8 0 - 1 06/30/08	ASB8 5 - 6 06/30/08	ASB9 0 - 1 06/30/08	ASB9 5 - 6 06/30/08	ASB10 0 - 1 06/30/08	ASB10 5 - 6 06/30/08	A31-SB011 0 - 1 12/30/08	A31-SB012 1 - 2 12/30/08	A31-SB012 5 - 6 12/30/08
Isophorone	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Naphthalene	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Nitrobenzene	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
N-Nitroso-di-n-propylamine	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	NA	NA	2.9	0.93 [1.4]	0.0052 J	<0.41	<0.40	0.20 J	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Pentachlorophenol	mg/kg	NA	NA	0.10	<1.7 [<1.8]	<0.047	<1.6	<1.6	<1.5	<2.0	<1.8	<1.9	<1.8	<1.7	<1.7	<1.8	NA	NA	NA
Phenanthrene	mg/kg	NA	NA	0.16	NA	<0.023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	NA	NA	NA	<0.44 [<0.45]	NA	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
Pyrene	mg/kg	NA	NA	0.24	<0.44 J [0.81 J]	<0.023	<0.41	<0.40	<0.38	<0.50	<0.45	<0.49	<0.45	<0.43	<0.43	<0.44	NA	NA	NA
PAHs																			
Benzo(a)anthracene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides																			
Dieldrin	mg/kg	NA	NA	<0.51	NA	<0.027	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs																			
Aroclor-1016	mg/kg	<0.020	<0.020	NA	<0.022 [<0.022]	NA	<0.020	<0.020	<0.019	<0.025	<0.023	<0.024	<0.022	<0.022	<0.022	<0.022	<0.020	<0.021	<0.022
Aroclor-1221	mg/kg	<0.020	<0.020	NA	<0.022 [<0.022]	NA	<0.020	<0.020	<0.019	<0.025	<0.023	<0.024	<0.022	<0.022	<0.022	<0.022	<0.020	<0.021	<0.022
Aroclor-1232	mg/kg	<0.020	<0.020	NA	<0.022 [<0.022]	NA	<0.020	<0.020	<0.019	<0.025	<0.023	<0.024	<0.022	<0.022	<0.022	<0.022	<0.020	<0.021	<0.022
Aroclor-1242	mg/kg	<0.020	<0.020	NA	<0.022 [<0.022]	NA	<0.020	<0.020	<0.019	<0.025	<0.023	<0.024	<0.022	<0.022	0.015 J	<0.022	<0.020	<0.021	<0.022
Aroclor-1248	mg/kg	<0.020	<0.020	NA	<0.022 [<0.022]	NA	<0.020	<0.020	<0.019	<0.025	<0.023	<0.024	<0.022	<0.022	<0.022	<0.022	<0.020	<0.021	<0.022
Aroclor-1254	mg/kg	<0.020	<0.020	2.4	1.2 J [0.34 J]	0.16	<0.020	<0.020	0.096 J	<0.025	<0.023	<0.024	0.20 J	<0.022	0.011 J	0.016 J	<0.020	<0.021	<0.022
Aroclor-1260	mg/kg	<0.020	<0.020	NA	<0.022 [<0.022]	NA	<0.020	<0.020	<0.019	<0.025	<0.023	<0.024	<0.022	<0.022	<0.022	<0.022	<0.020	<0.021	<0.022
Explosives																			
2,4-Dinitrotoluene	mg/kg	NA	NA	1.3	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	NA	NA	0.25 J,J	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	mg/kg	NA	NA	1.55 J	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics																			
Aluminum	mg/kg	NA	NA	21,000 ,J	32,300 [35,400]	36,000 ,J	37,000	31,900	28,600	34,700	38,100	35,600	37,100	34,800	38,800	42,300	NA	NA	NA
Antimony	mg/kg	NA	NA	0.630 ,J	<3.60 [<3.80]	<0.500 ,J	<3.60	<3.40	<3.30	<4.10	<4.00	<4.40	<4.00	<3.70	<3.90	<3.80	NA	NA	NA
Arsenic	mg/kg	NA	NA	20.0 ,J	10.4 [11.0]	1.80 ,J	3.60	2.30	4.60	3.60	4.20	3.30	6.40	2.80	6.30	3.60	NA	NA	NA
Barium	mg/kg	NA	NA	150 ,J	114 [90.9]	94.0 ,J	54.1	49.8	55.7	85.3	42.8	78.1	74.4	76.9	55.5	74.2	NA	NA	NA
Beryllium	mg/kg	NA	NA	0.590 J,J	0.790 J [0.800 J]	0.840 J,J	0.760 J	0.680 J	0.530 J	0.850 J	0.780 J	0.880 J	0.790 J	0.900 J	0.710 J	0.940 J	NA	NA	NA
Cadmium	mg/kg	NA	NA	1.30 ,J	0.850 J [0.520 J]	0.0720 J,J	<1.20	<1.10	0.230 J	<1.40	<1.30	<1.50	<1.30	<1.20	<1.30	<1.30	NA	NA	NA
Calcium	mg/kg	NA	NA	18,000 ,J	6,700 [9,020]	220 J,J	1,120 J	<1,130	722 J	<1,370	1,620	420 J	1,890	<1,250	1,480	<1,250	NA	NA	NA
Chromium	mg/kg	NA	NA	100 ,J	46.4 [59.7]	30.0 ,J	30.7	24.2	39.0	43.8	27.6	24.1	39.2	23.0	47.3	41.3	NA	NA	NA
Cobalt	mg/kg	NA	NA	6.90 ,J	7.60 [6.30]	22.0 ,J	5.30	3.90	4.00	21.0	3.80 J	7.40	5.40	32.7	3.60 J	6.40	NA	NA	NA
Copper	mg/kg	NA	NA	150 ,J	113 [68.1]	21.0 ,J	21.1	14.6	30.9	17.7	20.2	20.0	90.5	19.2	18.7	20.1	NA	NA	NA
Cyanide	mg/kg	NA	NA	0.210 j	NA	0.600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	NA	NA	33,000 ,J	44,400 [45,300]	47,000 ,J	46,900	33,400	38,500	44,300	47,700	44,300	48,000	46,100	56,400	50,100	NA	NA	NA
Lead	mg/kg	NA	NA	330 ,J	78.4 [95.7]	24.0 ,J	18.0	10.9	22.9	16.0	16.3	10.7	29.0	20.6	18.5	20.0	NA	NA	NA
Magnesium	mg/kg	NA	NA	10,000 ,J	4,480 [5,030]	2,700 ,J	1,560	1,210	1,050 J	1,230 J	1,700	2,350	1,710	2,170	1,540	1,540	NA	NA	NA
Manganese	mg/kg	NA	NA	310 ,J	329 [244]	950 ,J	226	135	168	772	152	232	272	836	117	364	NA	NA	NA
Mercury	mg/kg	NA	NA	0.140 ,J	0.0880 [0.0810]	0.0620 J,J	0.0670	0.0290 J	0.0720	0.0860	0.0560	0.0280 J	0.0930	0.0700	0.180	0.0290 J	NA	NA	NA
Nickel	mg/kg	NA	NA	13.0 ,J	18.4 [13.3]	19.0 ,J	12.4	11.2	8.50	12.9	12.6	15.2	12.7	14.2	10.6	14.7	NA	NA	NA
Potassium	mg/kg	NA	NA	1,100 ,J	1,510 [1,520]	2,600 ,J	1,250	1,350	922 J	1,520	1,450	2,390	1,540	2,370	967 J	1,890	NA	NA	NA
Selenium	mg/kg	NA	NA	0.320 J,J	<1.90 [<2.00 J]	0.160 J,J	<1.90	<1.80	<1.80	<2.20	<2.10 J	<2.40	<2.10	<2.00	<2.10	<2.00	NA	NA	NA
Silver	mg/kg	NA	NA	0.180 J,J	<2.40 [<2.50]	0.0640 J,J	<2.40	<2.30	<2.20	<2.70	<2.70	<2.90	<2.70	<2.50	<2.60	<2.50	NA	NA	NA
Sodium	mg/kg	NA	NA	41.0 J,J	<1,210 [<1,270]	<100 ,J	<1,190	<1,130	<1,120	<1,370	<1,340	<1,470	546 J	<1,250	<1,290	<1,250	NA	NA	NA
Thallium	mg/kg	NA	NA	0.210 J,J	<2.40 [<2.50]	0.390 J,J	<2.40	<2.30	<2.20	<2.70	<2.70	<2.90	<2.70	<2.50	<2.60	<2.50	NA	NA	NA
Vanadium	mg/kg	NA	NA	56.0 ,J	77.6 [83.5]	96.0 ,J	88.3	64.0	74.3	84.2	86.1	85.8	86.5	85.8	98.2	91.6	NA	NA	NA
Zinc	mg/kg	NA	NA	1,400 ,J	540 [375]	69.0 ,J	43.6	35.8	48.9	53.9	43.8	53.4	123	51.7	52.7	58.4	NA	NA	NA

Notes:
(a) USEPA (2008) Regional Screening Levels (RSLs).
(b) USEPA (2008) Protection of Groundwater Soil Screening Level (SSL) DAF 20.
Results in brackets [##] represent duplicate sample concentrations.
NA - parameter not analyzed
J - concentration is estimated
B - compound also detected in associated blank

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

Appendix D. Summary of Soil Sample Analytical Results RAAP-031

Location ID: Sample Depth(Feet): Date Collected:	Units	A31-SB013 0 - 1 12/30/08	A31-SB013 5 - 6 12/30/08	A31-SB014 0 - 1 12/30/08	A31-SB014 5 - 6 12/30/08	A31-SB015 2 - 3 12/30/08	A31-SB015 5 - 6 12/30/08	A31-SB016 0 - 1 12/30/08	A31-SB016 5 - 6 12/30/08	A31-SB017 0 - 1 12/30/08	A31-SB017 5 - 6 12/30/08	A31-SB018 0 - 1 12/30/08	A31-SB018 5 - 6 12/30/08	A31-SB019 0 - 1 12/30/08	A31-SB019 5 - 6 12/30/08
Volatile Organics															
Acetone	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organics															
1,1'-Biphenyl	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	<0.41 J [<0.42]	<0.42 J	0.50 J	<0.42 J	<0.42 J	<0.41 J	<0.42 J	<0.42 J	<0.42 J	<0.41 J	<0.46 J	<0.42 J	<0.42 J	<0.42 J
2,6-Dinitrotoluene	mg/kg	<0.41 [<0.42]	<0.42	<0.42	<0.42	<0.42	<0.41	<0.42	<0.42	<0.42 J	<0.41	<0.46 J	<0.42 J	<0.42 J	<0.42
2-Chloronaphthalene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-Methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroisopropyl)ether	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethylphthalate	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-Butylphthalate	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	mg/kg	<0.41 [<0.42]	<0.42	0.50 J	<0.42	<0.42	<0.41	<0.42	<0.42	<0.42	<0.41	<0.46	<0.42	<0.42	<0.42
Di-n-Octylphthalate	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Appendix D. Summary of Soil Sample Analytical Results RAAP-031

Location ID: Sample Depth(Feet): Date Collected:	Units	A31-SB013 0 - 1 12/30/08	A31-SB013 5 - 6 12/30/08	A31-SB014 0 - 1 12/30/08	A31-SB014 5 - 6 12/30/08	A31-SB015 2 - 3 12/30/08	A31-SB015 5 - 6 12/30/08	A31-SB016 0 - 1 12/30/08	A31-SB016 5 - 6 12/30/08	A31-SB017 0 - 1 12/30/08	A31-SB017 5 - 6 12/30/08	A31-SB018 0 - 1 12/30/08	A31-SB018 5 - 6 12/30/08	A31-SB019 0 - 1 12/30/08	A31-SB019 5 - 6 12/30/08
Isophorone	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAHs															
Benzo(a)anthracene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides															
Dieldrin	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor-1016	mg/kg	<0.020 [<0.021]	<0.021	<0.021	<0.021	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Aroclor-1221	mg/kg	<0.020 [<0.021]	<0.021	<0.021	<0.021	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Aroclor-1232	mg/kg	<0.020 [<0.021]	<0.021	<0.021	<0.021	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Aroclor-1242	mg/kg	<0.020 [<0.021]	<0.021	<0.021	<0.021	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Aroclor-1248	mg/kg	<0.020 [<0.021]	<0.021	<0.021	<0.021	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Aroclor-1254	mg/kg	<0.020 [<0.021]	<0.021	<0.021	<0.021	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Aroclor-1260	mg/kg	<0.020 [<0.021]	<0.021	<0.021	<0.021	<0.021	<0.020	<0.021	<0.021	<0.021	<0.020	<0.023	<0.021	<0.021	<0.021
Explosives															
2,4-Dinitrotoluene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics															
Aluminum	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	NA	NA	NA	NA	NA	NA	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.
Results in brackets [##] represent duplicate sample concentrations.
NA - parameter not analyzed
J - concentration is estimated
B - compound also detected in associated blank

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