RADFORD ARMY AMMUNITION PLANT, VIRGINIA

NRU Additional Characterization Sampling & Groundwater Investigation Data Report

Prepared for:
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Contract No. DACA31-01-F-0085

Final Document **October 2007**

Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24143-0100
USA

October 18, 2007

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

Subject: NRU Additional Characterization Sampling & Groundwater Investigation Data Report, Final Document, October 2007
Radford Army Ammunition Plant Installation Action Plan
EPA ID# VA1 210020730

Dear Mr. Cutler:

Enclosed is one copy of the subject document. Also under separate cover one copy will be sent to the distribution below.

Please note the subject document represents the final product of the contractor's effort and as such it can not be revised. From several meetings, the latest which occurred September 12, 2007 in Philadelphia, PA and September 20, 2007 in Radford, VA we discussed in broad terms the future effort envisioned for the NRU. At this time we are currently working with various Army agencies to procure that effort. When it is awarded there will be ample opportunity for input and consultation.

Please coordinate with and provide any questions or comments to myself at (540) 639-8658, Jerry Redder of my staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 639-8641.

Sincerely,

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07-815-198
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

BDDT ..... Building Debris Disposal Trench
bgs ..... below ground surface
BLA ..... Bag Loading Area
CFR ..... Code of Federal Regulations
CSM ..... Conceptual Site Model
FS ..... Feasibility Study
ft ..... foot or feet
FWBSR ..... Facility-Wide Background Study Report
GPS ..... Global Positioning System
IAA ..... Igniter Assembly Area
IDM ..... Investigative-derived Materials
MCL ..... Maximum Contaminant Level
MHSP ..... Master Health and Safety Plan
MMA ..... Main Manufacturing Area
MQAP ..... Master Quality Assurance Plan
msl ..... mean sea level
MWP ..... Master Work Plan
NBG ..... Northern Burning Ground
NRU ..... New River Unit
PAH ..... Polynuclear Aromatic Hydrocarbon
PCB ..... Polychlorinated Biphenyl
RBC ..... Risk Based Concentration
RFAAP ..... Radford Army Ammunition Plant
RI ..... Remedial Investigation
RY ..... Rail Yard
SSL ..... Soil Screening Level
SVOC ..... Semivolatile Organic Compound
TAL ..... Target Analyte List
TCL ..... Target Compound List
TOC ..... Total Organic Carbon
TOX ..... Total Organic Halides
USACE ..... U.S. Army Corps of Engineers
USEPA ..... U.S. Environmental Protection Agency
VDEQ ..... Virginia Department of Environmental Quality
VOC ..... Volatile Organic Compound
WBG ..... Western Burning Ground
XRF ..... X-ray Fluorescence

1.0 INTRODUCTION

This data report is intended to summarize investigation activities that occurred at the New River Unit (NRU) of Radford Army Ammunition Plant (RFAAP) during the summer of 2004 and the summer of 2007.

The 2004 field effort included additional characterization sampling at the Building Debris Disposal Trench (BDDT), the Northern Burning Ground (NBG) and the Western Burning Ground (WBG). The objective of the sampling was to complete the delineation of elevated constituents in soil and sediment at the sites.

The 2007 field effort included the installation and sampling of monitoring wells at the NRU to provide an initial assessment of the groundwater at the NRU. Aerial photographic interpretations of historic use and geologic structures/lineaments were also completed during the 2007 investigation. **Figure 1-1** presents the locations of the sites within the NRU and the locations of the newly installed monitoring wells.

1.1 2003 Internal Draft New River Unit Investigation Report

In 2003, Shaw submitted the *Internal Draft New River Unit Investigation Report* to the Army. After submittal, it was decided that the report should broken into individual site reports and the report was not commented on or submitted to the regulatory agencies. The report summarized the investigation activities that had taken place at each of the sites through 2002, which included soil, surface water and sediment. There were no groundwater components to any of the previous investigations. The soil, surface water and sediment at three sites [Igniter Assembly Area (IAA), Bag Loading Area (BLA) and Rail Yard (RY)] were considered sufficiently characterized that further investigation of these media was not warranted. An additional characterization investigation was required at the BDDT, the NBG and the WBG and is described below.

1.2 2004 Investigation Approach

Samples were collected during the 2004 Investigation to complete the delineation of constituents detected during the 2002 RI. X-ray fluorescence (XRF) screening for lead was conducted at the NBG and WBG. The screening allowed sample collection to be guided by the results of nearby samples. A similar approach was used at the BDDT to delineate elevated PAHs, although samples were analyzed offsite at a laboratory rather than screened onsite. The PAH analysis was performed on a 48-hour turn-around-time, so that results would be available prior to collection of the next set of samples. Activities performed for the 2004 investigation were site-specific and are discussed further in the relevant sections below. Sample location information for the laboratory-analyzed samples is presented in **Appendix A.**

Perchlorate was detected during the 2002 Investigation in one surface water sample (WBGSW14 – 1.71 ug/L) collected from the unnamed creek where it first enters the NRU. During the 2004 Investigation, two additional surface water samples (WBGSW16 and 17) were collected from the first 100 feet of the unnamed creek where it enters the NRU to attempt to confirm the 2002 perchlorate detection. The two 2004 samples were analyzed for perchlorate, which was not detected in either sample.

1.3 2007 Investigation Approach

A two-tiered approach to investigating groundwater at the NRU was implemented for the groundwater investigation.

The first tier consists of regional activities that are applicable to all of the individual sites at the NRU. These activities include an aerial photographic interpretation to assess historic activities at the sites and to assess geologic patterns; such as springs, sinkholes indicating solution features, and/or photolineaments that may represent fractures or faults. These geologic features may indicate preferential groundwater flow pathways at the NRU. These regional activities were used to focus the site-specific groundwater investigations at each of the sites.

The second tier consisted of site-specific activities, including:

- the installation of groundwater monitoring wells at the WBG, the NBG, the IAA, and the BLA to assess groundwater quality and to identify potential impacts to groundwater from historic site activities; and,
- a geophysical survey at the WBG to more precisely locate any fractures/solution features leading from the former burning ground to the unnamed pond to the southwest.

It has been assumed for the purposes of the groundwater investigation at the NRU that the Rail Yard (RY) Remedial Investigation (RI) Report will be accepted by the regulatory agencies without additional investigative activities.

1.3.1 2007 Regional Activities

1.3.1.1 Air Photo Analysis

Features controlling karst development (fractures sets) and features indicative of karst (sinkholes) are not documented in available topographic maps. Existing imagery available from the Commonwealth of Virginia, USACE Topographic Engineering Center, and the National Archives was used to complete the following for the NRU:

Photogeologic Analysis. An examination of pre- and post- construction imagery (1940-1955) was conducted to map fracture sets, lineaments, sinkhole patterns, spring, and drainage patterns within NRU boundary. Where possible, stereo pairs of images were used to provide the highest degree of accuracy in the mapping of geologic information. The results of the photogeologic analysis are presented on **Figure 1-2**.

Historic Air Photo Analysis. The 1940-1955 era imagery was also examined to assess extent and type of activities at the known and suspected waste disposal sites and the NRU. The results of the historic air photo analysis are presented on **Figure 1-3**.

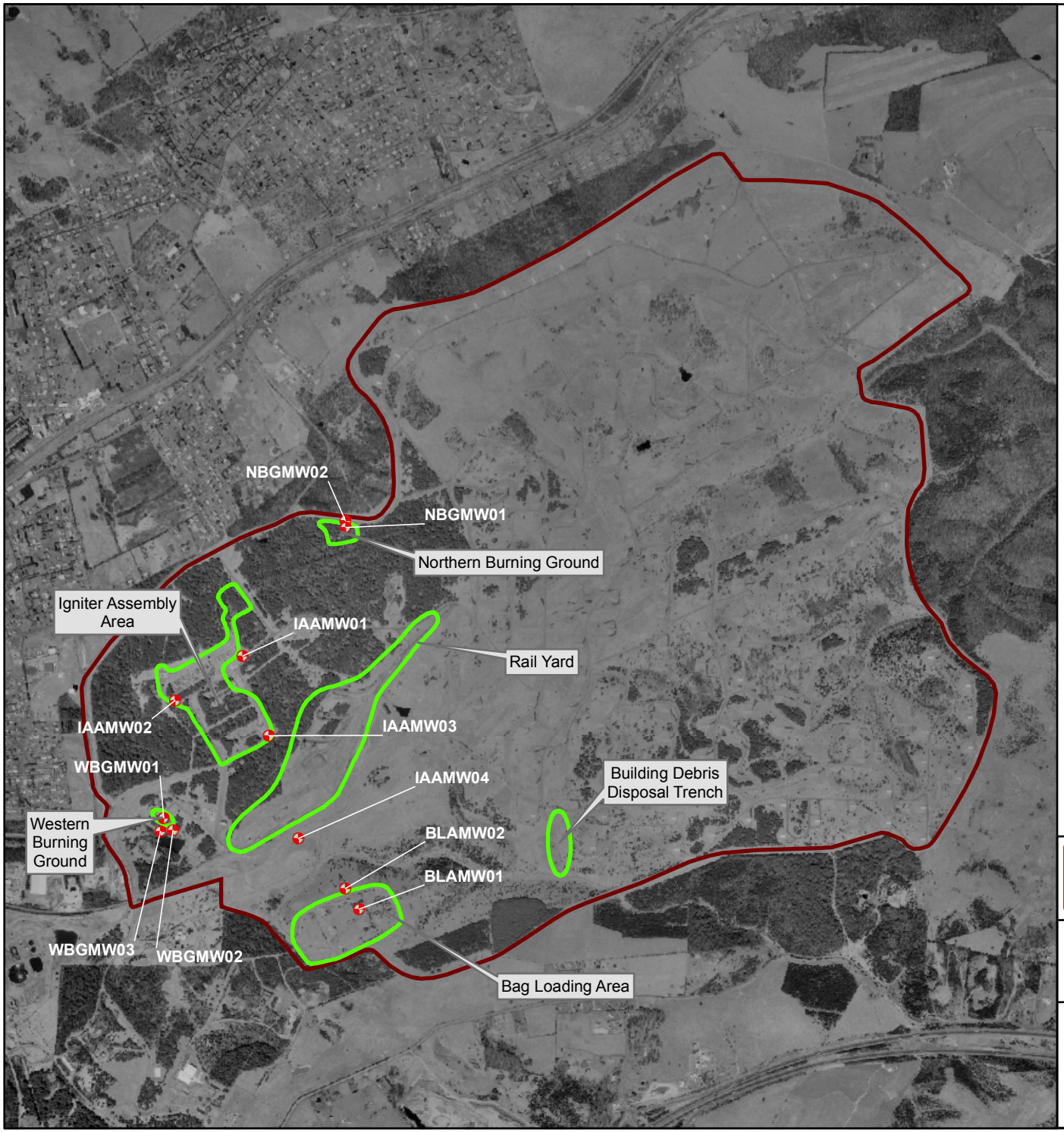
1.3.1.2 Field Reconnaissance

Shaw conducted a field inspection of all outcrops, springs, and streams to asses potential groundwater recharge and discharge points, structural controls influencing groundwater flow, and potential sampling locations for contaminants and groundwater tracer dye. The field reconnaissance was also used to verify the features identified during the photogeologic analysis.

1.3.2 2007 Site Specific Activities

Site specific activities included the installation of monitoring wells and a geophysical survey at the Western Burning Ground. **Table 1-1** presents the well ID and analysis for each well. The analytical data for the groundwater samples are presented in **Table 1-2**. **Table 1-3** presents each

well's coordinates, ground elevations and total depth for each well. Boring logs for the wells are presented in **Appendix B**. The geophysical report for the WBG is included as **Appendix C**. The site specific activities are discussed in the site specific sections that follow.



LEGEND

- Monitoring Well
- Site Boundary
- NRU Installation Boundary

Notes:
1) Aerial photo and basemap data were obtained from Radford AAP.

N

Scale:

0 1,000 2,000 4,000 Feet

U.S. Army Corps of Engineers

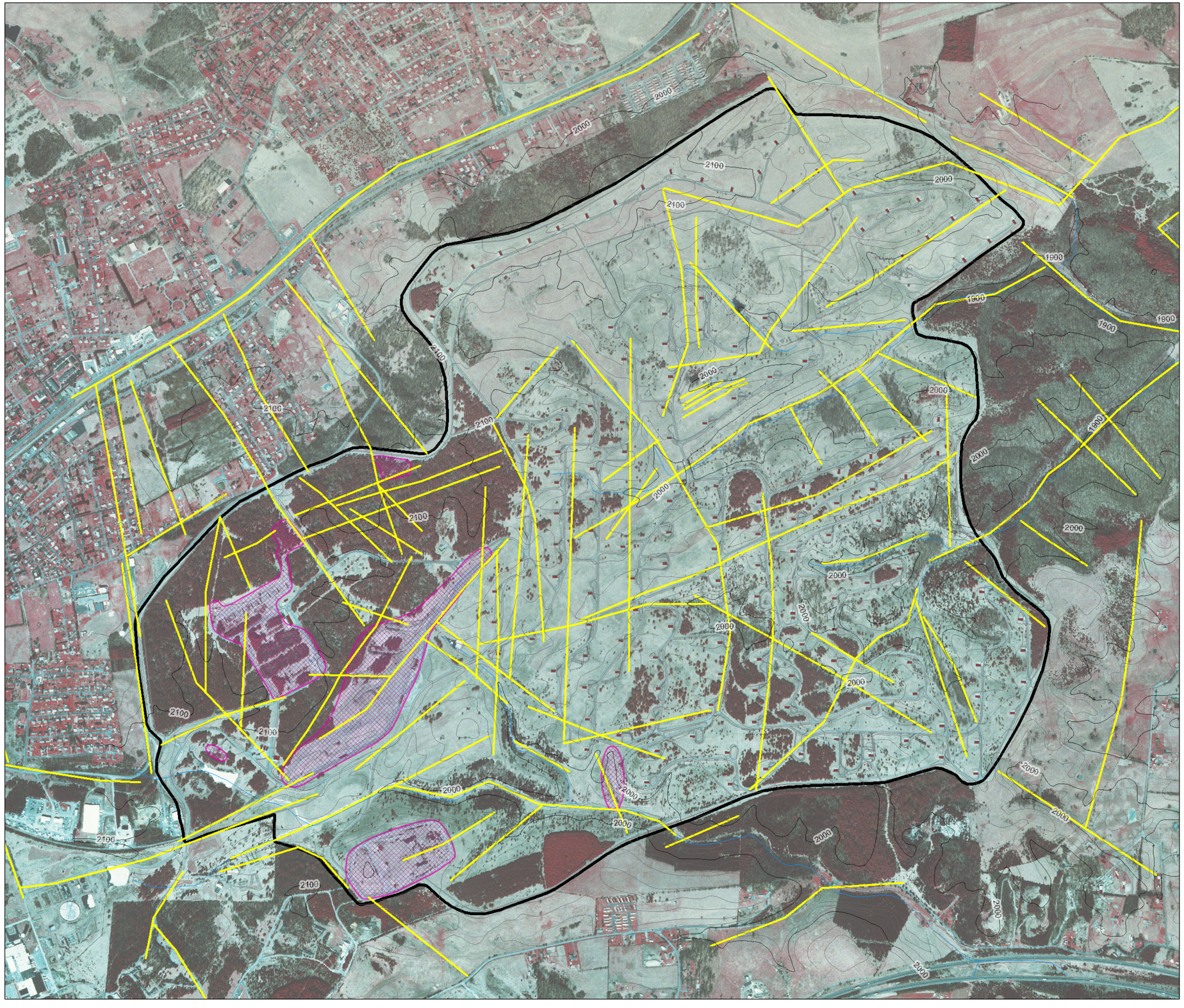
Shaw® Shaw Environmental, Inc.

FIGURE 1-1

NRU Site Location Map

Radford Army Ammunition Plant
Radford, VA

ArcGIS File: RFAAP_Fig1-1_NRU_SiteMap.mxd (10/2/2007 11:31:58 AM)



LEGEND

- Photo linear
- SWMU boundaries
- Installation boundary
- Site paved roads
- Streams
- Site building

Regional Highways

- Limited Access
- Highway
- Major Road

Note: Photo linears were interpreted from 1976 black and white 1:80000 nominal scale, 1996 color infared 1:16000 nominal scale aerial photography and USGS 1/3 arc second topography. Computer-aided stereographic interpretation techniques were used to identify linear features. Roadways and other cultural linear features were not included in compilation of features. Linear features included on this drawing include geologic faults, fractures, and bedding planes that result in a topographic and/or vegatative expression on the photos. Field confirmation of these features is required.

N
W E
S

Scale: 1:8,000

0 1,000 2,000 4,000

Feet

U.S. Army Corps of Engineers

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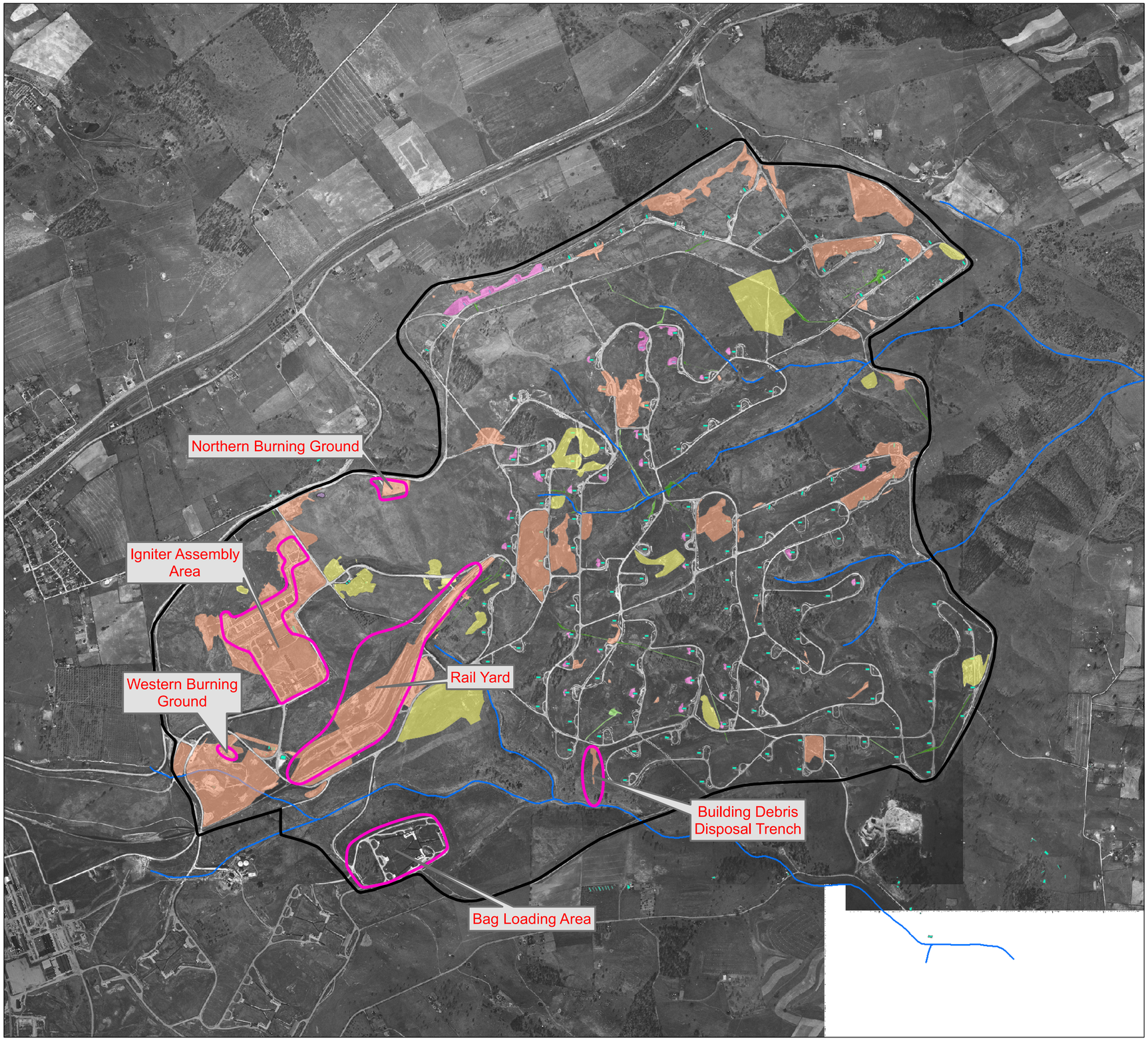
FIGURE 1-2

PHOTO LINEAR ANALYSIS

Radford Army Ammunition Plant
Radford, VA

ArcGIS File: RFAAP_003_Linear_Analysis_final.mxd, Gary.Hecox, (9/5/2007 2:43:21 AM)



LEGEND

1949 Disturbed Areas

Area Type

- Disturbed area near building, likely bunker
- Disturbed area, undifferentiated
- Pond or depression
- Road, abandoned
- Road, ditch, or berm
- Scraped area

- SWMU boundaries
- Installation boundary
- Building
- Stream

Roadways

- Limited Access
- Highway
- Major Road

Notes:
1) Aerial photo basemap from 1949 14 micron scanned imagery obtained from U.S. Geological Survey EROS Data Center.
2) Photointerpretation performed using georeferenced 1949 imagery looking for disturbed areas potentially related to operation of RFAAP. Areas were calssified according to visual appearance of respective features on imagery. No field confirmation has been conducted as of the date of map production.

N
W E
S

Scale:1:9,000

0 1,000 2,000 4,000

Feet

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 1-3
PHOTOINTERPRETED 1949 DISTURBED AREAS

Radford Army Ammunition Plant
Radford, VA

ArcGIS File: RFAAP_004_Historical_Disturbed_Area.mxd (9/5/2007)

Table 1-1
2007 Sampling and Analysis

Medium	Sample ID	Location	Sample Analyses
Western Burning Ground			
Groundwater	WBGMW01	Center of former burning area	TCL VOCs, TCL SVOCs/PAHs, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
	WBGMW02	Between former burning area and pond	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
	WBGMW03	Between former burning area and pond	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
Northern Burning Ground			
Groundwater	NBGMW01	Near the center of the burning area in area where highest lead levels detected in soil	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
	NBGMW02	North of burning area, near the NRU boundary fence	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
Igniter Assembly Area			
Groundwater	IAAMW01	Downgradient and proximal to the buildings with conductive flooring	TCL VOCs, TAL metals and perchlorate
	IAAMW02	Downgradient of IAA	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
	IAAMW03	Downgradient of IAA	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
	IAAMW04	Downgradient of IAA, near unnamed creek	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
Bag Loading Area			
Groundwater	BLAMW01	Downgradient and proximal to the buildings with conductive flooring	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX
	BLAMW02	Downgradient of BLA	TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC and TOX

Table 1-2
New River Unit
Monitoring Well Sample Results

Analyte	Sample ID		BLAMW01					BLAMW02					IAAMW01					IAAMW02					IAAMW03					IAAMW04				
	Sample Date		6/20/07					6/21/07					6/21/07					6/20/07					6/20/07					6/21/07				
	MCL	tw-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
VOCs (ug/L)																																
Acetone	na	550	25	U		5	25	5.4	J	B	5	25	25	U		5	25	25	U		5	25	25	U		5	25	25	U		5	25
Chloroform	80	0.15	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1
Toluene	1000	75	0.74	J	B	0.5	1	1	U	UL	0.5	1	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1
PAHs (ug/L)	PAHs were not detected in the wells.																															
SVOCs (ug/L)	SVOCs were not detected in the wells																															
Pesticides (ug/L)	Pesticides were not detected in the wells																															
PCBs (ug/L)	PCBs were not detected in the wells																															
Explosives (ug/L)	Explosives were not detected in the wells																															
Herbicides (ug/L)	Herbicides were not detected in the wells																															
Metals (ug/L)																																
Aluminum	50	3700	424			18	200	4970			18	200	34900			18	200	18	U		18	200	875			18	200	2850			18	200
Arsenic	10	0.045	2.8	U		2.8	10	2.8	U		2.8	10	20.9			2.8	10	2.8	U		2.8	10	2.8	U		2.8	10	2.8	U		2.8	10
Barium	2000	730	151	J	J	5	200	242			5	200	105	J	J	5	200	240			5	200	49.7	J	J	5	200	41.3	J	J	5	200
Beryllium	4	7.3	1	U		1	4	1	U		1	4	17.7			1	4	1	U		1	4	1.2	J	K	1	4	1	U		1	4
Calcium	na	na	63000			42	1000	260000			42	1000	47900			42	1000	79600		J	42	1000	75900			42	1000	63800			42	1000
Chromium	100	11	56.9		J	0.6	10	170			0.6	10	101			0.6	10	4	J	J	0.6	10	35.2		J	0.6	10	17.1			0.6	10
Cobalt	na	na	4.7	J	J	1	50	10.5	J	J	1	50	30.2	J	J	1	50	1	U		1	50	2.4	J	J	1	50	1.5	J	J	1	50
Copper	1300	150	3.1	J	K	1	25	19.3	J	B	1	25	42			1	25	1	U		1	25	1	U		1	25	1.3	J	B	1	25
Iron	300	2600	683			15	300	7280			15	300	83300			15	300	15	U		15	300	1490			15	300	4270			15	300
Lead	15	na	3.5	J	B	1.7	10	7.1	J	B	1.7	10	80.9			1.7	10	2.9	J	B	1.7	10	2.5	J	B	1.7	10	3.5	J	B	1.7	10
Magnesium	na	na	17200			4.3	5000	61100			4.3	5000	13900			4.3	5000	18700			4.3	5000	9670			4.3	5000	30100			4.3	5000
Manganese	50	73	29.4			1.5	15	151			1.5	15	1790			1.5	15	27.3			1.5	15	30.1			1.5	15	169			1.5	15
Mercury	2	1.1	0.1	U		0.1	1	0.1	U		0.1	1	0.2	U		0.2	2	0.1	U		0.1	1	0.1	U		0.1	1	0.1	U		0.1	1
Nickel	na	73	35.8	J	J	1	40	115			1	40	92.8			1	40	3.6	J	J	1	40	11.8	J	J	1	40	11.8	J	J	1	40
Potassium	na	na	4000	J	B	100	10000	9330	J	J	100	10000	7790	J	B	100	10000	3370	J	B	100	10000	3450	J	B	100	10000	3820	J	B	100	10000
Selenium	50	18	2.8	U		2.8	10	2.8	U		2.8	40	22.2		B	2.8	10	2.8	U		2.8	10	2.8	U		2.8	10	2.8	U		2.8	10
Sodium	na	na	3130	J	B	500	10000	5730	J	B	500	10000	2850	J	B	500	10000	6910	J	B	500	10000	8850	J	B	500	10000	6860	J	B	500	10000
Vanadium	na	3.7	1.8	J	J	1.1	50	15.3	J	J	1.1	50	112			1.1	50	1.1	U		1.1	50	3.1	J	J	1.1	50	8.6	J	J	1.1	50
Zinc	5000	1100	17.4	J	B	1.6	20	23.9		B	1.6	20	226			1.6	20	5.1	J	B	1.6	20	7.2	J	B	1.6	20	7.9	J	B	1.6	20
Misc. (ug/L)																																
Perchlorate	na	2.6	0.2	U	UJ	0.0612	0.2	0.2	U	UJ	0.0612	0.2	0.191	J	B	0.0612	0.2	0.156	J	B	0.0612	0.2	0.2	U	UJ	0.0612	0.2	0.195	J	B	0.0612	0.2
Total Organic Carbon	na	na	1000	U		1000	1000	80700			5000	5000	NT					1100			1000	1000	1000	U		1000	1000	1000	U		1000	1000
Dioxins/Furans (ng/L)																																
2,3,7,8-TCDF	na	na	0.00576	U		0.00156	0.00156	0.0121	J	J	0.00115	0.00115	NT					0.000743	EMP	B	0.00113	0.00113	0.00251	U		0.00251	0.00251	0.00913	J	B	0.00115	0.00115
2,3,7,8-TCDD	0.03	0.00045	0.00576	U		0.00188	0.00188	0.00425	J	J	0.00115	0.00115	NT					0.00113	U		0.00113	0.00113	0.00309	U		0.00309	0.00309	0.00315	EMP	J	0.00115	0.00115
1,2,3,7,8-PECDD	na	na	0.00576	U		0.00576	0.00576	0.00471	J	B	0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00294	J	B	0.00575	0.00575
1,2,3,4,7,8-HXCDD	na	0.011	0.00576	U		0.00576	0.00576	0.00577	U		0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
1,2,3,6,7,8-HXCDD	na	0.011	0.00576	U		0.00576	0.00576	0.00577	U		0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
1,2,3,7,8,9-HXCDD	na	0.011	0.00576	U		0.00576	0.00576	0.00577	U,Q	UJ	0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
1,2,3,4,6,7,8-HPCDD	na	na	0.00576	U		0.00576	0.00576	0.00312	EMP	J	0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
OCDD	na	na	0.00816	J	J	0.0115	0.0115	0.065	J	J	0.0115	0.0115	NT					0.00628	J	J	0.0113	0.0113	0.0144	J	J	0.012	0.012	0.0229	J	J	0.0115	0.0115
1,2,3,7,8-PECDF	na	na	0.00576	U		0.00576	0.00576	0.019	J	B	0.00577	0.00577	NT					0.000901	EMP	B	0.00563	0.00563	0.00268	EMP	B	0.00598	0.00598	0.0122	J	B	0.00575	0.00575
2,3,4,7,8-PECDF	na	na	0.000968	EMP	B	0.00576	0.00576	0.0158	J	B	0.00577	0.00577	NT					0.00115	J	B	0.00563	0.00563	0.00211	J	B	0.00598	0.00598	0.00975	J	B	0.00575	0.00575
1,2,3,4,7,8-HXCDF	na	na	0.00272	J	B	0.00576	0.00576	0.00367	J	B	0.00577	0.00577	NT					0.00173	J	B	0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00221	EMP	B	0.00575	0.00575
1,2,3,6,7,8-HXCDF	na	na	0.00177	J	B	0.00576	0.00576	0.0024	J	B	0.00577	0.00577	NT					0.0011	J	B	0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00129	J	B	0.00575	0.00575
2,3,4,6,7,8-HXCDF	na	na	0.00576	U		0.00576	0.00576	0.00199	EMP	B	0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.000989	EMP	B	0.00575	0.00575
1,2,3,7,8,9-HXCDF	na	na	0.00576	U		0.00576	0.00576	0.00577	U		0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
1,2,3,4,6,7,8-HPCDF	na	na	0.0121	J	B	0.00576	0.00576	0.00245	J	B	0.00577	0.00577	NT					0.00426	J	B	0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00138	J	B	0.00575	0.00575
1,2,3,4,7,8,9-HPCDF	na	na	0.00576	U		0.00576	0.00576	0.00577	U		0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
OCDF	na	na	0.0236	J	B	0.0115	0.0115	0.0115	U		0.0115	0.0115	NT					0.00505	J	B	0.0113	0.0113	0.012	U		0.012	0.012	0.0115	U		0.0115	0.0115
TOTAL TCDD	na	na	0.00188	U		0.00188	0.00188	0.00425	J	J	0.00115	0.00115	NT					0.00563	U		0.00113	0.00113	0.00309	U		0.00309	0.00309	0.00315	EMP	J	0.00115	0.00115
TOTAL PECDD	na	na	0.00576	U		0.00576	0.00576	0.00471	J	B	0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00294	J	B	0.00575	0.00575
TOTAL HXCDD	na	0.011	0.00576	U		0.00576	0.00576	0.00577	U		0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
TOTAL HPCDD	na	na	0.00576	U		0.00576	0.00576	0.00686	EMP	J	0.00577	0.00577	NT					0.00563	U		0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00575	U		0.00575	0.00575
TOTAL TCDF	na	na	0.00156	U		0.00156	0.00156	0.0121	J	B	0.00115	0.00115	NT					0.000743	J	B	0.00113	0.00113	0.00251	U		0.00251	0.00251	0.00913	J	B	0.00115	0.00115
TOTAL PECDF	na	na	0.00258	J	B	0.00576	0.00576	0.0348	J	B	0.00577	0.00577	NT					0.00264	EMP	B	0.00563	0.00563	0.00478	EMP	B	0.00598	0.00598	0.0227	EMP	B	0.00575	0.00575
TOTAL HXCDF	na	na	0.00592	J	B	0.00576	0.00576	0.00806	EMP	B	0.00577	0.00577	NT					0.00399	J	B	0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00448	EMP	B	0.00575	0.00575
TOTAL HPCDF	na	na	0.0147	J	B	0.00576	0.00576	0.00245	J	B	0.00577	0.00577	NT					0.00426	J	B	0.00563	0.00563	0.00598	U		0.00598	0.00598	0.00138	J	B	0.00575	0.00575

12 J Shading and black font indicates a MCL exceedance

12 J Bold outline indicates a tw-RBC exceedance.

12 *12* Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-carcinogenic compounds have been recalculated to an HI of 0.1.

RBCs for carcinogenic compounds are shown in red font.

The pyrene RBC was used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene and are shown in blue.

RBC source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 1-2
New River Unit
Monitoring Well Sample Results

Analyte		Sample ID	NBGMW01					NBGMW02					WBGMW01					WBGMW02					WBGMW03				
		Sample Date	6/19/07					6/19/07					6/18/07					6/18/07					6/19/07				
	MCL	tw-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
VOCs (ug/L)																											
Acetone	na	550	25	U		5	25	25	U		5	25	25	U		5	25	5.6	J	B	5	25	25	U		5	25
Chloroform	80	0.15	1	U		0.5	1	1	U		0.5	1	1.2		J	0.5	1	1	U		0.5	1	1	U		0.5	1
Toluene	1000	75	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1	1	U		0.5	1
PAHs (ug/L)	PAHs were not detected in the wells.																										
SVOCs (ug/L)	SVOCs were not detected in the wells																										
Pesticides (ug/L)	Pesticides were not detected in the wells																										
PCBs (ug/L)	PCBs were not detected in the wells																										
Explosives (ug/L)	Explosives were not detected in the wells																										
Herbicides (ug/L)	Herbicides were not detected in the wells																										
Metals (ug/L)																											
Aluminum	50	3700	448			18	200	1790			18	200	17800			18	200	91	J	B	18	200	18	U		18	200
Arsenic	10	0.045	6.3	J	B	2.8	10	2.8	U		2.8	10	8.2	J	B	2.8	10	2.8	U		2.8	10	2.8	U		2.8	10
Barium	2000	730	99.5	J	J	5	200	93.9	J	J	5	200	130	J	J	5	200	81.9	J	J	5	200	147	J	J	5	200
Beryllium	4	7.3	1	U		1	4	1.1	J	K	1	4	1.9	J	K	1	4	1	U		1	4	1	U		1	4
Calcium	na	na	78200		J	42	1000	75600		J	42	1000	345000		J	42	1000	95900		J	42	1000	106000		J	42	1000
Chromium	100	11	17.1			0.6	10	20.5			0.6	10	48			0.6	10	7	J	J	0.6	10	3.8	J	J	0.6	10
Cobalt	na	na	5.6	J	J	1	50	1.9	J	J	1	50	9.3	J	J	1	50	1	U		1	50	2.4	J	J	1	50
Copper	1300	150	1	U		1	25	1	U		1	25	17.2	J	B	1	25	1	U		1	25	1	U		1	25
Iron	300	2600	470			15	300	2470			15	300	19200			15	300	15	U		15	300	15	U		15	300
Lead	15	na	2.9	J	B	1.7	10	1.8	J	B	1.7	10	34.3			1.7	10	1.8	J	B	1.7	10	2.2	J	B	1.7	10
Magnesium	na	na	11600			4.3	5000	16400			4.3	5000	104000			4.3	5000	36800			4.3	5000	32700			4.3	5000
Manganese	50	73	32.7			1.5	15	42.4			1.5	15	256			1.5	15	15.5			1.5	15	6.7	J	B	1.5	15
Mercury	2	1.1	0.1	U		0.1	1	0.1	U		0.1	1	0.54	J	J	0.1	1	0.1	U		0.1	1	0.1	U		0.1	1
Nickel	na	73	11.8	J	J	1	40	14.2	J	J	1	40	22	J	J	1	40	5	J	J	1	40	5.8	J	J	1	40
Potassium	na	na	4350	J	B	100	10000	4460	J	B	100	10000	12000		J	100	10000	4440	J	B	100	10000	4050	J	B	100	10000
Selenium	50	18	2.8	U		2.8	10	2.8	U		2.8	10	2.8	U		2.8	50	2.8	U		2.8	10	2.8	U		2.8	20
Sodium	na	na	2830	J	B	500	10000	2870	J	B	500	10000	25600		J	500	10000	6940	J	B	500	10000	6230	J	B	500	10000
Vanadium	na	3.7	1.5	J	J	1.1	50	5.6	J	J	1.1	50	40.3	J	J	1.1	50	1.1	J	J	1.1	50	1.1	U		1.1	50
Zinc	5000	1100	9	J	B	1.6	20	13.8	J	B	1.6	20	112		J	1.6	20	10.5	J	B	1.6	20	17.1	J	B	1.6	20
Misc. (ug/L)																											
Perchlorate	na	2.6	0.2	U	UJ	0.0612	0.2	0.176	J	B	0.0612	0.2	0.2	U	UJ	0.0612	0.2	0.0911	J	B	0.0612	0.2	0.19	J	B	0.0612	0.2
Total Organic Carbon	na	na	1000	U		1000	1000	1000	U		1000	1000	2200			1000	1000	2300			1000	1000	1400			1000	1000
Dioxins/Furans (ng/L)																											
2,3,7,8-TCDF	na	na	0.0038	J	B	0.00257	0.00257	0.00156	EMP	B	0.00169	0.00169	0.00296	U		0.00296	0.00296	0.00356	U		0.00356	0.00356	0.00245	U		0.00245	0.00245
2,3,7,8-TCDD	0.03	0.00045	0.00318	J	J	0.00374	0.00374	0.00201	U		0.00201	0.00201	0.00396	U		0.00396	0.00396	0.00512	U		0.00512	0.00512	0.00356	U		0.00356	0.00356
1,2,3,7,8-PECDD	na	na	0.00777	J	B	0.00573	0.00573	0.00455	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,4,7,8-HXCDD	na	0.011	0.00575	J	B	0.00573	0.00573	0.00284	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,6,7,8-HXCDD	na	0.011	0.00513	J	B	0.00573	0.00573	0.00324	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,7,8,9-HXCDD	na	0.011	0.00554	J	B	0.00573	0.00573	0.00333	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,4,6,7,8-HPCDD	na	na	0.00367	J	J	0.00573	0.00573	0.00373	J	J	0.00583	0.00583	0.0479	J, B	B	0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
OCDD	na	na	0.0102	EMP	J	0.0115	0.0115	0.0226	J	J	0.0117	0.0117	0.395	B	B	0.0169	0.0169	0.00688	J	B	0.0108	0.0108	0.0109	U		0.0109	0.0109
1,2,3,7,8-PECDF	na	na	0.00946	J	B	0.00573	0.00573	0.00513	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
2,3,4,7,8-PECDF	na	na	0.00738	J	B	0.00573	0.00573	0.00431	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00205	EMP	B	0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,4,7,8-HXCDF	na	na	0.0071	J	B	0.00573	0.00573	0.00434	J	B	0.00583	0.00583	0.00802	J	B	0.00846	0.00846	0.00641	J	B	0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,6,7,8-HXCDF	na	na	0.00625	J	B	0.00573	0.00573	0.00347	J	B	0.00583	0.00583	0.00369	J	B	0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
2,3,4,6,7,8-HXCDF	na	na	0.00419	J	B	0.00573	0.00573	0.00261	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,7,8,9-HXCDF	na	na	0.00623	J	B	0.00573	0.00573	0.0034	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
1,2,3,4,6,7,8-HPCDF	na	na	0.00609	J	B	0.00573	0.00573	0.00457	J	B	0.00583	0.00583	0.0308	J, B	B	0.00846	0.00846	0.0128	J	B	0.00539	0.00539	0.0083	J	B	0.00546	0.00546
1,2,3,4,7,8,9-HPCDF	na	na	0.00412	J	J	0.00573	0.00573	0.00583	U		0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00615	U		0.00615	0.00615	0.00546	U		0.00546	0.00546
OCDF	na	na	0.00763	EMP	B	0.0115	0.0115	0.00758	J	B	0.0117	0.0117	0.0926	J, B	B	0.0169	0.0169	0.0395	J	B	0.0108	0.0108	0.0101	J	B	0.0109	0.0109
TOTAL TCDD	na	na	0.00318	J	J	0.00374	0.00374	0.00201	U		0.00201	0.00201	0.00396	U		0.00396	0.00396	0.00512	U		0.00512	0.00512	0.00356	U		0.00356	0.00356
TOTAL PECDD	na	na	0.00777	J	B	0.00573	0.00573	0.00455	J	B	0.00583	0.00583	0.00846	U		0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
TOTAL HXCDD	na	0.011	0.0164	J	B	0.00573	0.00573	0.00942	J	B	0.00583	0.00583	0.0145	EMP	B	0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
TOTAL HPCDD	na	na	0.00367	J	J	0.00573	0.00573	0.00373	J	J	0.00583	0.00583	0.0847	J, B	B	0.00846	0.00846	0.00539	U		0.00539	0.00539	0.00546	U		0.00546	0.00546
TOTAL TCDF	na	na	0.0038	J	B	0.00257	0.00257	0.00156	EMP	B	0.00169	0.00169	0.00296	U		0.00296	0.00296	0.00356	U		0.00356	0.00356	0.00245	U		0.00245	0.00245
TOTAL PECDF	na	na	0.0205	EMP	B	0.00573	0.00573	0.00944	J	B	0.00583	0.00583	0.00305	J	B	0.00846	0.00846	0.0103	J	B	0.00539	0.00539	0.00546	U		0.00546	0.00546
TOTAL HXCDF	na	na	0.0238	J	B	0.00573	0.00573	0.0138	J	B	0.00583	0.00583	0.0175	EMP	B	0.00846	0.00846	0.0121	EMP	B	0.00539	0.00539	0.00546	U		0.00546	0.00546
TOTAL HPCDF	na	na	0.0102	J	B	0.00573	0.00573	0.00457	J	B	0.00583	0.00583	0.0376	J, B	B	0.00846	0.00846	0.0128	J	B	0.00539	0.00539	0.0083	J	B	0.00546	0.00546

12 J Shading and black font indicates a MCL exceedance

12 J Bold outline indicates a tw-RBC exceedance.

12 *12* Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-carcinogenic compounds have been recalculated to an HI of 0.1.

RBCs for carcinogenic compounds are shown in red font.

The pyrene RBC was used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene and are shown in blue.

RBC source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 1-3
New River Unit Groundwater Investigation
Monitoring Well Details

Well ID	Northing (ft)	Northing (ft)	Ground Elevation (ft msl)	TOC Elevation (ft msl)	DTW (ft msl)	DTB (ft msl)	DTW (TOC)	DTB (TOC)	TOC Height (ft)	Height of Water Column (ft)
NBGMW01	3569777.80	10851810.48	2115.79	2118.34	2019.66	2015.24	93.58	98.00	2.55	4.42
NBGMW02	3569872.47	10851804.11	2110.05	2112.67	2009.78	2004.08	97.65	103.35	2.62	5.70
IAAMW01	3568011.29	10850394.64	2116.17	2118.90	2077.49	2077.23	35.95	36.21	2.73	0.26
IAAMW02	3567399.30	10849464.83	2123.96	2126.63	2030.03	1958.69	91.26	162.60	2.67	71.34
IAAMW03	3566913.67	10850758.28	2091.77	2094.51	2021.91	2008.36	67.12	80.67	2.74	13.55
IAAMW04	3565504.32	10851159.66	2020.70	2023.64	1954.76	1927.31	63.00	90.45	2.94	27.45
BLAMW01	3564530.07	10851995.99	2088.35	2090.92	1962.79	1862.25	122.99	223.53	2.57	100.54
BLAMW02	3564814.00	10851807.48	2073.70	2077.07	1923.87	1915.53	146.46	154.80	3.37	8.34
WBGMW01	3565783.83	10849309.86	2057.85	2060.38	2028.35	2026.52	26.97	28.80	2.53	1.83
WBGMW02	3565612.88	10849437.23	2060.85	2063.35	2017.84	2006.39	40.51	51.96	2.50	11.45
WBGMW03	3565596.35	10849266.40	2050.87	2053.18	2035.40	1997.04	13.16	51.52	2.31	38.36

* Water levels measured June 2007
* Coordinates in NAD 1983, US State Plane (Virginia South)
TOC - Top of Casing
DTW - Depth to Water
DTB - Depth to Bottom
msl - mean sea level
ft - feet or foot

2.0 BUILDING DEBRIS DISPOSAL TRENCH

2.1 Site Description and History

The BDDT is located in the southern portion of the NRU (**Figure 1-1**). The trench was formerly an ephemeral unlined natural drainage channel that had eroded into the clay surficial soil. The trench has been incorporated into the storm water drainage system at the NRU. A culvert diverts storm water runoff underneath A Avenue into the trench. The trench then channels surface water runoff down the length of the ditch to the unnamed creek at the base of the BDDT. There is a delta of sediment eroded from the ditch at the base of the ditch where it meets the unnamed creek. The natural depression formed by the trench was previously utilized for the disposal of miscellaneous building debris derived from the demolition of various NRU structures. Building debris consisted of concrete, wood, and rusted and deteriorated 5 gallon containers of a tarry substance believed to be roofing tar. The debris has been removed and the trench is now lined with a geotextile membrane and covered with rip-rap, preventing further deposition of trench sediment in the delta.

2.2 Summary of Previous Investigations

The primary constituents with elevated concentrations at the BDDT were PAHs associated with the disposal of roofing tar drums in the trench. The 1998 RI mitigated future impacts by removing the debris, including the drums, and visibly stained soil from the trench and delta areas. Migration of residual constituents present in the trench after the RI sampling effort is limited by the emplacement of a geotextile membrane and rip-rap.

Based on the results of the 2002 samples, in conjunction with the previously collected data at the site, volatile organic compounds (VOCs), non-polynuclear aromatic hydrocarbon (PAH), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), herbicides, explosive compounds, and metals are not a concern at the BDDT study area. PAHs are present in surface soil in the delta area. Results from the sediment and surface water samples indicate that the delta area acted as an accumulation point for the PAH compounds and these compounds no longer reach the creek in sufficient concentrations to negatively impact the creek.

Results from the 2002 Investigation (Shaw, 2003) indicate that PAHs are confined to surface soil (0-6 inches) in this area, but did not complete the delineation of PAHs in the delta area.

2.3 2004 Additional Delineation Sampling

The activities at the BDDT were intended to complete the assessment of the horizontal and vertical extent of elevated PAHs in the delta area at the downslope end of the BDDT, where it intersects with the unnamed creek. A summary of the sampling is presented in **Table 2-1**.

A total of 42 surface and five subsurface soil samples were collected from seven parallel sample lines positioned perpendicular to the trench delta. Sample locations are presented on **Figure 2-1**. Sample Lines 1 through 4 were spaced approximately 30 ft apart, while sample Lines 5 through 7 were spaced approximately 40 ft apart. Surface soil samples were collected in a multi step approach. Initially, 32 samples (DTSB48A through DTSB79A) were collected within and near the perimeter of the delta. Samples DTSB49A, DTSB53A, DTSB61A, and DTSB79A were held at the analytical laboratory pending the results of the remaining samples. Samples were

Table 2-1
2004 Sampling and Analysis
Building Debris Disposal Trench

Media	Number of Samples	Analysis	Objective
Surface Soil	43	TCL PAHs, TCL PCBs	Characterize the lateral extent of PAHs in delta area
Subsurface Soil	5	TCL PAHs, TCL PCBs	Confirm PAHs attenuate rapidly with depth

submitted for low level PAH analyses with a 48 hour turn-around time. In addition, 28 of the 47 samples were analyzed for PCBs to address concerns for the potential of PCBs to enter the NRU watershed. Results from the first set of samples were used to guide the placement of the subsequent samples (DTSB80A through DTSB89A). Samples were stepped out from the original set of locations where PAHs were reported at concentrations greater than the adjusted residential screening levels and continued until concentrations were below residential screening levels. Results from the sampling event are tabulated in **Table 2-2.**

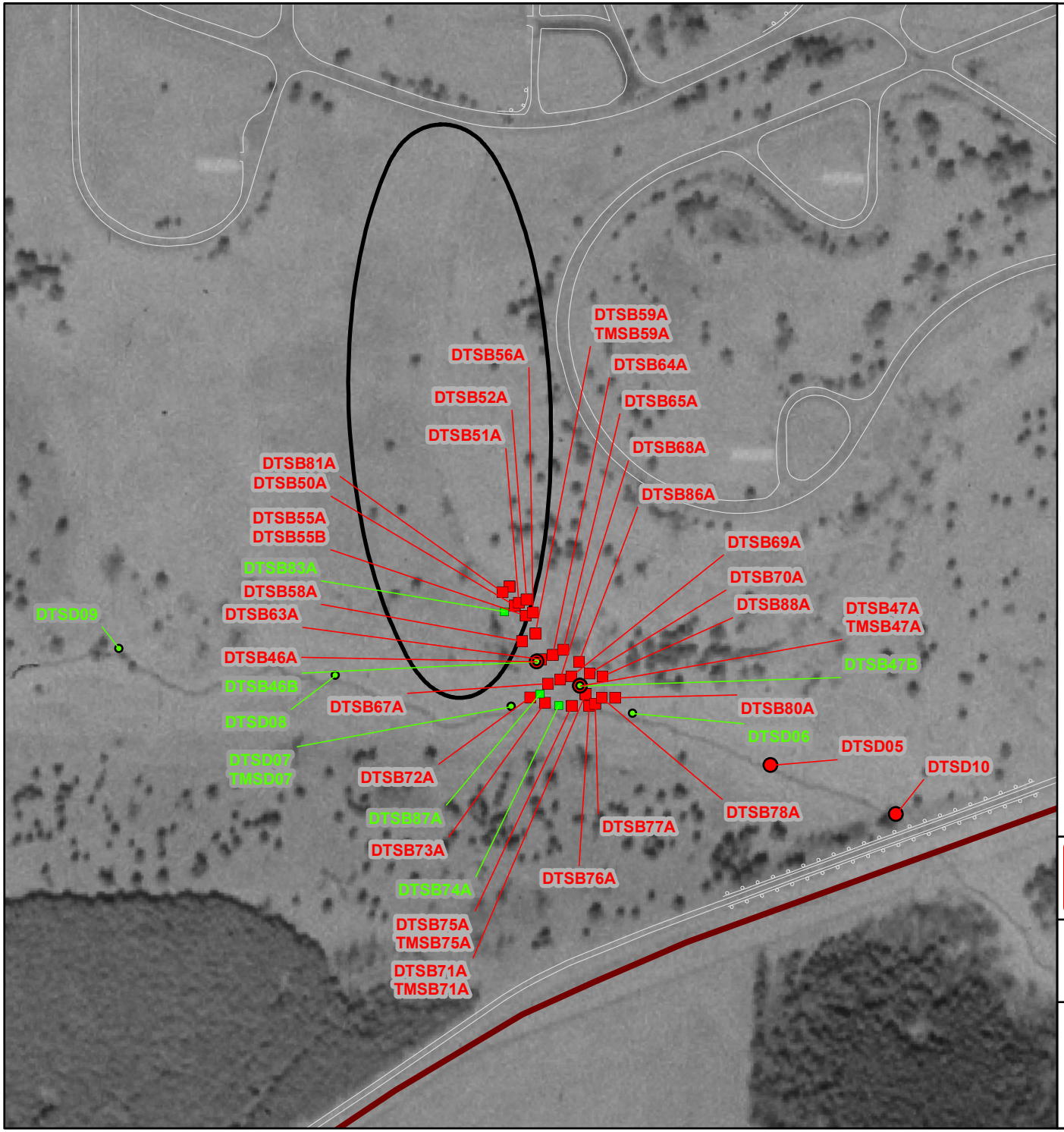
PAHs. Similar to the 2002 Investigation soil sampling results, seventeen PAHs were detected in the soil samples. Five PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were detected in soil samples with concentrations exceeding industrial screening levels. One additional PAH [benzo(k)fluoranthene] was detected in two samples (DTSB55A and DTSB67A) at a concentrations exceeding its residential screening level. Naphthalene exceeded its SSL criteria in six surface and two subsurface soil samples. The naphthalene concentrations were less than the residential screening level.

PCBs. PCBs were not detected in the samples.

2.4 2007 Groundwater Investigation

No additional activities were performed at the BDDT during the 2007 groundwater investigation because:

- the unnamed stream is the likely discharge point for groundwater at the BDDT;
- the impacted area at BDDT has been removed and lined with geotextile fabric; and,
- PAH-containing soil is primarily limited to surface soil.



LEGEND

- 2002 Benzo(a)pyrene Residential RBC Detect (Non-Exceedance)
- 2002 Benzo(a)pyrene Residential RBC Exceedance (> 22 ug/kg)
- 2004 Benzo(a)pyrene Residential RBC Detect (Non-Exceedance)
- 2004 Benzo(a)pyrene Residential RBC Exceedance (> 22 ug/kg)
- Road
- Building Debris Disposal Trench Boundary
- NRU Installation Boundary

Note:
1) Aerial photo, dated 25 May 2000, was obtained from the Army Topographic Engineering Center.

N

Scale:
0 112.5 225 450
Feet

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3-1
2002 and 2004 Benzo(a)pyrene Results at the Building Debris Disposal Trench
Radford Army Ammunition Plant
Radford, VA

ArcGIS File: RFAAP_Fig3-1_NRU_BDDT_Benzo_02_04_Results.mxd (9/4/2007 1:57:51 PM)

Table 2-2
Building Debris Disposal Trench
2004 Sample Results

Analyte	Sample ID	DTSB48A					DTSB48B					DTSB50A					DTSB51A					DTSB52A					DTSB54A				
	Sample Date	7/13/04					7/20/04					7/13/04					7/13/04					7/13/04					7/13/04				
	Sample Depth	0-0.5					1-3					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																
2-Methylnaphthalene	410000	31000	92			*8.1*	*8.1*	89			*81*	*81*	8.7	U		*8.7*	*8.7*	51			*8.2*	*8.2*	43	U		*43*	*43*	9.1	U		*9.1*	*9.1*
Acenaphthene	6100000	470000	730			*320*	*320*	1800			*81*	*81*	26			*8.7*	*8.7*	820			*330*	*330*	640			*43*	*43*	9.1	U		*9.1*	*9.1*
Acenaphthylene	3100000	230000	150			*8.1*	*8.1*	81	U		*81*	*81*	16			*8.7*	*8.7*	83			*8.2*	*8.2*	43	U		*43*	*43*	9.1	U		*9.1*	*9.1*
Anthracene	31000000	2300000	1600			*320*	*320*	3100			*81*	*81*	94			*8.7*	*8.7*	1900			*330*	*330*	1100			*43*	*43*	9.1	U		*9.1*	*9.1*
Benz(a)anthracene	3900	220	3700			*320*	*320*	5900			*810*	*810*	210			*8.7*	*8.7*	3500			*330*	*330*	2200			*220*	*220*	9.1	U		*9.1*	*9.1*
Benzo(a)pyrene	390	22	2800			*320*	*320*	5000			*810*	*810*	180			*8.7*	*8.7*	2700			*330*	*330*	2000			*43*	*43*	9.1	U		*9.1*	*9.1*
Benzo(b)fluoranthene	3900	220	4700			*320*	*320*	7700			*810*	*810*	330			*8.7*	*8.7*	4400			*330*	*330*	3000			*220*	*220*	12			*9.1*	*9.1*
Benzo(g,h,i)perylene	3100000	230000	1500			*320*	*320*	3000			*81*	*81*	130			*8.7*	*8.7*	1300			*330*	*330*	1000			*43*	*43*	9.1	U		*9.1*	*9.1*
Benzo(k)fluoranthene	39000	2200	1600			*320*	*320*	2400			*81*	*81*	84			*8.7*	*8.7*	1600			*330*	*330*	940			*43*	*43*	9.1	U		*9.1*	*9.1*
Chrysene	390000	22000	3400			*320*	*320*	5200			*810*	*810*	230			*8.7*	*8.7*	3400			*330*	*330*	2100			*220*	*220*	9.1	U		*9.1*	*9.1*
Dibenz(a,h)anthracene	390	22	550			*320*	*320*	81	U		*81*	*81*	37			*8.7*	*8.7*	330	U		*330*	*330*	310			*43*	*43*	9.1	U		*9.1*	*9.1*
Fluoranthene	4100000	310000	9900			*320*	*320*	17000			*810*	*810*	540			*17*	*17*	9800			*330*	*330*	6700			*220*	*220*	13			*9.1*	*9.1*
Fluorene	4100000	310000	690			*320*	*320*	1800			*81*	*81*	24			*8.7*	*8.7*	840			*330*	*330*	590			*43*	*43*	9.1	U		*9.1*	*9.1*
Indeno(1,2,3-cd)pyrene	3900	220	1400			*320*	*320*	2900			*81*	*81*	120			*8.7*	*8.7*	1200			*330*	*330*	1000			*43*	*43*	9.1	U		*9.1*	*9.1*
Naphthalene	2000000	160000	400			*320*	*320*	320			*81*	*81*	8.7	U		*8.7*	*8.7*	150			*8.2*	*8.2*	86			*43*	*43*	9.1	U		*9.1*	*9.1*
Phenanthrene	3100000	230000	7400			*320*	*320*	14000			*810*	*810*	300			*8.7*	*8.7*	8300			*330*	*330*	5500			*220*	*220*	9.1	U		*9.1*	*9.1*
Pyrene	3100000	230000	7600			*320*	*320*	9800			*810*	*810*	370			*8.7*	*8.7*	7900			*330*	*330*	4300			*220*	*220*	12			*9.1*	*9.1*
PCBs (ug/kg)			PCBs were not detected																													

Analyte	Sample ID	DTSB55A					DTSB55B					DTSB56A					DTSB57A					DTSB58A					DTSB59A				
	Sample Date	7/13/04					7/20/04					7/13/04					7/13/04					7/13/04					7/13/04				
	Sample Depth	0-0.5					1-3					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																
2-Methylnaphthalene	410000	31000	510			*85*	*85*	24			*8.3*	*8.3*	11			*9*	*9*	8.8	U		*8.8*	*8.8*	10	U		*10*	*10*	54			*8.7*	*8.7*
Acenaphthene	6100000	470000	13000			*3400*	*3400*	78			*8.3*	*8.3*	300			*9*	*9*	8.8	U		*8.8*	*8.8*	62			*10*	*10*	690			*170*	*170*
Acenaphthylene	3100000	230000	310			*85*	*85*	8.3	U		*8.3*	*8.3*	72			*9*	*9*	8.8	U		*8.8*	*8.8*	11			*10*	*10*	99			*8.7*	*8.7*
Anthracene	31000000	2300000	23000			*3400*	*3400*	73			*8.3*	*8.3*	650			*90*	*90*	8.8	U		*8.8*	*8.8*	150			*10*	*10*	1500			*170*	*170*
Benz(a)anthracene	3900	220	43000			*3400*	*3400*	150			*8.3*	*8.3*	1300			*90*	*90*	8.8	U		*8.8*	*8.8*	350			*10*	*10*	2900			*170*	*170*
Benzo(a)pyrene	390	22	32000			*3400*	*3400*	120			*8.3*	*8.3*	970			*90*	*90*	8.8	U		*8.8*	*8.8*	270			*10*	*10*	2200			*170*	*170*
Benzo(b)fluoranthene	3900	220	54000			*3400*	*3400*	180			*8.3*	*8.3*	2300			*90*	*90*	8.8	U		*8.8*	*8.8*	430			*10*	*10*	3700			*170*	*170*
Benzo(g,h,i)perylene	3100000	230000	15000			*3400*	*3400*	61			*8.3*	*8.3*	540			*90*	*90*	8.8	U		*8.8*	*8.8*	180			*10*	*10*	1100			*170*	*170*
Benzo(k)fluoranthene	39000	2200	16000			*3400*	*3400*	56			*8.3*	*8.3*	2300			*90*	*90*	8.8	U		*8.8*	*8.8*	150			*10*	*10*	1000			*170*	*170*
Chrysene	390000	22000	43000			*3400*	*3400*	140			*8.3*	*8.3*	1300			*90*	*90*	8.8	U		*8.8*	*8.8*	380			*10*	*10*	2700			*170*	*170*
Dibenz(a,h)anthracene	390	22	3400	U		*3400*	*3400*	20			*8.3*	*8.3*	210			*9*	*9*	8.8	U		*8.8*	*8.8*	10	U		*10*	*10*	370			*8.7*	*8.7*
Fluoranthene	4100000	310000	130000			*3400*	*3400*	470			*17*	*17*	3400			*90*	*90*	8.8	U		*8.8*	*8.8*	940			*21*	*21*	8300			*170*	*170*
Fluorene	4100000	310000	13000			*3400*	*3400*	72			*8.3*	*8.3*	270			*9*	*9*	8.8	U		*8.8*	*8.8*	69			*10*	*10*	670			*170*	*170*
Indeno(1,2,3-cd)pyrene	3900	220	15000			*3400*	*3400*	68			*8.3*	*8.3*	550			*90*	*90*	8.8	U		*8.8*	*8.8*	170			*10*	*10*	1100			*170*	*170*
Naphthalene	2000000	160000	1300			*85*	*85*	160			*8.3*	*8.3*	24			*9*	*9*	8.8	U		*8.8*	*8.8*	10	U		*10*	*10*	150			*8.7*	*8.7*
Phenanthrene	3100000	230000	110000			*3400*	*3400*	430			*17*	*17*	2500			*90*	*90*	8.8	U		*8.8*	*8.8*	730			*21*	*21*	6700			*170*	*170*
Pyrene	3100000	230000	99000			*3400*	*3400*	280		J	*8.3*	*8.3*	2700			*90*	*90*	8.8	U		*8.8*	*8.8*	700			*21*	*21*	6200			*170*	*170*
PCBs (ug/kg)			PCBs were not detected																													

Analyte	Sample ID	DTSB59B					DTSB60A					DTSB62A					DTSB63A					DTSB64A					DTSB65A				
	Sample Date	7/20/04					7/13/04					7/13/04					7/13/04					7/13/04					7/13/04				
	Sample Depth	1-3					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																
2-Methylnaphthalene	410000	31000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	8.7	U		*8.7*	*8.7*	30	U		*30*	*30*	10	U		*10*	*10*
Acenaphthene	6100000	470000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	49			*8.7*	*8.7*	160			*30*	*30*	10	U		*10*	*10*
Acenaphthylene	3100000	230000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	13			*8.7*	*8.7*	30	U		*30*	*30*	10	U		*10*	*10*
Anthracene	31000000	2300000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	130			*8.7*	*8.7*	340			*30*	*30*	21			*10*	*10*
Benz(a)anthracene	3900	220	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	340			*8.7*	*8.7*	960			*30*	*30*	58			*10*	*10*
Benzo(a)pyrene	390	22	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	280			*8.7*	*8.7*	880			*30*	*30*	58			*10*	*10*
Benzo(b)fluoranthene	3900	220	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	460			*35*	*35*	1500			*30*	*30*	110			*10*	*10*
Benzo(g,h,i)perylene	3100000	230000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	190			*8.7*	*8.7*	490			*30*	*30*	41			*10*	*10*
Benzo(k)fluoranthene	39000	2200	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	140			*8.7*	*8.7*	330			*30*	*30*	31			*10*	*10*
Chrysene	390000	22000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	380			*8.7*	*8.7*	970			*30*	*30*	66			*10*	*10*
Dibenz(a,h)anthracene	390	22	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	8.7	U		*8.7*	*8.7*	30	U		*30*	*30*	12			*10*	*10*
Fluoranthene	4100000	310000	8.3	U		*8.3*	*8.3*	12			*11*	*11*	9.1			*9.1*	*9.1*	840			*35*	*35*	2600			*60*	*60*	150			*10*	*10*
Fluorene	4100000	310000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	45			*8.7*	*8.7*	140			*30*	*30*	10	U		*10*	*10*
Indeno(1,2,3-cd)pyrene	3900	220	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	170			*8.7*	*8.7*	490			*30*	*30*	35			*10*	*10*
Naphthalene	2000000	160000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	8.7	U		*8.7*	*8.7*	42			*30*	*30*	10	U		*10*	*10*
Phenanthrene	3100000	230000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	430			*8.7*	*8.7*	1500			*60*	*60*	67			*10*	*10*
Pyrene	3100000	230000	8.3	U		*8.3*	*8.3*	11	U		*11*	*11*	9.1	U		*9.1*	*9.1*	690			*35*	*35*	1500			*60*	*60*	100			*10*	*10*
PCBs (ug/kg)			PCBs were not detected																													

Table 2-2
Building Debris Disposal Trench
2004 Sample Results

Analyte	Sample ID		DTSB66A					DTSB67A					DTSB67B					DTSB68A					DTSB69A					DTSB70A				
	Sample Date		7/13/04					7/13/04					7/20/04					7/13/04					7/13/04					7/13/04				
	Sample Depth		0-0.5					0-0.5					1-3					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																
2-Methylnaphthalene	410000	31000	8.4	U		*8.4*	*8.4*	2000			*87*	*87*	8.1	U		*8.1*	*8.1*	9.2	U		*9.2*	*9.2*	8.5	U		*8.5*	*8.5*	9.2	U		*9.2*	*9.2*
Acenaphthene	6100000	470000	8.4	U		*8.4*	*8.4*	10000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	110			*9.2*	*9.2*	22			*8.5*	*8.5*	13			*9.2*	*9.2*
Acenaphthylene	3100000	230000	8.4	U		*8.4*	*8.4*	210			*87*	*87*	8.1	U		*8.1*	*8.1*	43			*9.2*	*9.2*	8.5	U		*8.5*	*8.5*	9.2	U		*9.2*	*9.2*
Anthracene	31000000	2300000	8.4	U		*8.4*	*8.4*	17000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	290			*9.2*	*9.2*	43			*8.5*	*8.5*	37			*9.2*	*9.2*
Benz(a)anthracene	3900	220	8.4	U		*8.4*	*8.4*	27000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	690			*37*	*37*	160			*8.5*	*8.5*	100			*9.2*	*9.2*
Benzo(a)pyrene	390	22	8.4	U		*8.4*	*8.4*	22000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	600			*37*	*37*	150			*8.5*	*8.5*	110		L	*9.2*	*9.2*
Benzo(b)fluoranthene	3900	220	8.4	U		*8.4*	*8.4*	36000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	1100			*37*	*37*	250			*8.5*	*8.5*	130			*9.2*	*9.2*
Benzo(g,h,i)perylene	3100000	230000	8.4	U		*8.4*	*8.4*	11000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	350			*9.2*	*9.2*	85			*8.5*	*8.5*	76			*9.2*	*9.2*
Benzo(k)fluoranthene	39000	2200	8.4	U		*8.4*	*8.4*	9300			*1800*	*1800*	8.1	U		*8.1*	*8.1*	260			*9.2*	*9.2*	66			*8.5*	*8.5*	87		L	*9.2*	*9.2*
Chrysene	390000	22000	8.4	U		*8.4*	*8.4*	25000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	770			*37*	*37*	160			*8.5*	*8.5*	130		L	*9.2*	*9.2*
Dibenz(a,h)anthracene	390	22	8.4	U		*8.4*	*8.4*	3600			*87*	*87*	8.1	U		*8.1*	*8.1*	120			*9.2*	*9.2*	23			*8.5*	*8.5*	9.2	U		*9.2*	*9.2*
Fluoranthene	4100000	310000	8.4	U		*8.4*	*8.4*	78000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	1700			*37*	*37*	420			*8.5*	*8.5*	350		L	*9.2*	*9.2*
Fluorene	4100000	310000	8.4	U		*8.4*	*8.4*	10000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	96			*9.2*	*9.2*	18			*8.5*	*8.5*	12			*9.2*	*9.2*
Indeno(1,2,3-cd)pyrene	3900	220	8.4	U		*8.4*	*8.4*	10000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	340			*9.2*	*9.2*	78			*8.5*	*8.5*	76			*9.2*	*9.2*
Naphthalene	2000000	160000	8.4	U		*8.4*	*8.4*	11000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	15			*9.2*	*9.2*	8.5	U		*8.5*	*8.5*	9.2	U		*9.2*	*9.2*
Phenanthrene	3100000	230000	8.4	U		*8.4*	*8.4*	74000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	1100			*37*	*37*	240			*8.5*	*8.5*	160			*9.2*	*9.2*
Pyrene	3100000	230000	8.4	U		*8.4*	*8.4*	60000			*1800*	*1800*	8.1	U		*8.1*	*8.1*	1400			*37*	*37*	270			*8.5*	*8.5*	220			*9.2*	*9.2*
PCBs (ug/kg)			PCBs were not detected																													

Analyte	Sample ID		DTSB71A					DTSB72A					DTSB73A					DTSB74A					DTSB75A					DTSB76A				
	Sample Date		7/13/04					7/13/04					7/13/04					7/13/04					7/13/04					7/13/04				
	Sample Depth		0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																
2-Methylnaphthalene	410000	31000	9.5	U		*9.5*	*9.5*	8.7	U		*8.7*	*8.7*	8.9	U		*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	9	U		*9*	*9*	8.1	U		*8.1*	*8.1*
Acenaphthene	6100000	470000	28			*9.5*	*9.5*	11			*8.7*	*8.7*	8.9	U		*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	63		J	*9*	*9*	110		J	*8.1*	*8.1*
Acenaphthylene	3100000	230000	9.5	U		*9.5*	*9.5*	8.7	U		*8.7*	*8.7*	8.9	U		*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	11			*9*	*9*	8.9			*8.1*	*8.1*
Anthracene	31000000	2300000	68			*9.5*	*9.5*	30			*8.7*	*8.7*	18			*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	200		J	*9*	*9*	220		J	*8.1*	*8.1*
Benz(a)anthracene	3900	220	200			*9.5*	*9.5*	69			*8.7*	*8.7*	40			*8.9*	*8.9*	9.3			*8.1*	*8.1*	450		J	*36*	*36*	460		J	*40*	*40*
Benzo(a)pyrene	390	22	190			*9.5*	*9.5*	67			*8.7*	*8.7*	34			*8.9*	*8.9*	8.9			*8.1*	*8.1*	420		J	*9*	*9*	390		J	*40*	*40*
Benzo(b)fluoranthene	3900	220	210			*9.5*	*9.5*	97			*8.7*	*8.7*	39			*8.9*	*8.9*	14			*8.1*	*8.1*	450		J	*36*	*36*	590		J	*40*	*40*
Benzo(g,h,i)perylene	3100000	230000	120			*9.5*	*9.5*	52			*8.7*	*8.7*	24			*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	280		J	*9*	*9*	210		J	*8.1*	*8.1*
Benzo(k)fluoranthene	39000	2200	160			*9.5*	*9.5*	48			*8.7*	*8.7*	35			*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	320		J	*9*	*9*	180		J	*8.1*	*8.1*
Chrysene	390000	22000	240			*9.5*	*9.5*	84			*8.7*	*8.7*	48			*8.9*	*8.9*	8.9			*8.1*	*8.1*	550		J	*36*	*36*	430		J	*40*	*40*
Dibenz(a,h)anthracene	390	22	56		J	*9.5*	*9.5*	24		J	*8.7*	*8.7*	8.9	U		*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	130		J	*9*	*9*	60		J	*8.1*	*8.1*
Fluoranthene	4100000	310000	650			*19*	*19*	190			*8.7*	*8.7*	110			*8.9*	*8.9*	15			*8.1*	*8.1*	1400		J	*36*	*36*	1200		J	*40*	*40*
Fluorene	4100000	310000	26			*9.5*	*9.5*	11			*8.7*	*8.7*	8.9	U		*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	70		J	*9*	*9*	110		J	*8.1*	*8.1*
Indeno(1,2,3-cd)pyrene	3900	220	120			*9.5*	*9.5*	52			*8.7*	*8.7*	24			*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	280		J	*9*	*9*	210		J	*8.1*	*8.1*
Naphthalene	2000000	160000	9.5	U		*9.5*	*9.5*	8.7	U		*8.7*	*8.7*	8.9	U		*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	13		J	*9*	*9*	8.1	U		*8.1*	*8.1*
Phenanthrene	3100000	230000	330			*9.5*	*9.5*	130			*8.7*	*8.7*	72			*8.9*	*8.9*	8.1	U		*8.1*	*8.1*	830		J	*36*	*36*	950		J	*40*	*40*
Pyrene	3100000	230000	400			*9.5*	*9.5*	140			*8.7*	*8.7*	76			*8.9*	*8.9*	13			*8.1*	*8.1*	820		J	*36*	*36*	810		J	*40*	*40*
PCBs (ug/kg)			PCBs were not detected																									PCBs were not detected.				

Analyte	Sample ID		DTSB77A					DTSB77B					DTSB78A					DTSB80A					DTSB81A					DTSB82A				
	Sample Date		7/13/04					7/20/04					7/13/04					7/20/04					7/20/04					7/20/04				
	Sample Depth		0-0.5					1-3					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																
2-Methylnaphthalene	410000	31000	180	U		*180*	*180*	8	U		*8*	*8*	9.2	U		*9.2*	*9.2*	8.1	U		*8.1*	*8.1*	9.1	U		*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Acenaphthene	6100000	470000	2500			*180*	*180*	8	U		*8*	*8*	9.2	U		*9.2*	*9.2*	8.1	U		*8.1*	*8.1*	9.1	U		*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Acenaphthylene	3100000	230000	180	U		*180*	*180*	8	U		*8*	*8*	9.2	U		*9.2*	*9.2*	8.1	U		*8.1*	*8.1*	20			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Anthracene	31000000	2300000	4800			*180*	*180*	8	U		*8*	*8*	18			*9.2*	*9.2*	8.1	U		*8.1*	*8.1*	56			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Benz(a)anthracene	3900	220	6500			*180*	*180*	8	U		*8*	*8*	74			*9.2*	*9.2*	24		K	*8.1*	*8.1*	110			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Benzo(a)pyrene	390	22	6300			*180*	*180*	8	U		*8*	*8*	79			*9.2*	*9.2*	24		K	*8.1*	*8.1*	93			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Benzo(b)fluoranthene	3900	220	6800			*180*	*180*	8	U		*8*	*8*	120			*9.2*	*9.2*	41		K	*8.1*	*8.1*	220			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Benzo(g,h,i)perylene	3100000	230000	4300			*180*	*180*	8	U		*8*	*8*	50			*9.2*	*9.2*	18			*8.1*	*8.1*	71			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Benzo(k)fluoranthene	39000	2200	4800			*180*	*180*	8	U		*8*	*8*	34			*9.2*	*9.2*	8.5		K	*8.1*	*8.1*	69			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Chrysene	390000	22000	7100			*180*	*180*	8	U		*8*	*8*	72			*9.2*	*9.2*	24		K	*8.1*	*8.1*	130			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Dibenz(a,h)anthracene	390	22	180	U		*180*	*180*	8	U		*8*	*8*	15			*9.2*	*9.2*	8.1	U		*8.1*	*8.1*	9.1	U		*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Fluoranthene	4100000	310000	27000			*910*	*910*	8	U		*8*	*8*	160			*9.2*	*9.2*	50		K	*8.1*	*8.1*	210			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Fluorene	4100000	310000	2800			*180*	*180*	8	U		*8*	*8*	9.2	U		*9.2*	*9.2*	8.1	U		*8.1*	*8.1*	9.1	U		*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Indeno(1,2,3-cd)pyrene	3900	220	4200			*180*	*180*	8	U		*8*	*8*	43			*9.2*	*9.2*	17		K	*8.1*	*8.1*	69			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Naphthalene	2000000	160000	250			*180*	*180*	8	U		*8*	*8*	9.2	U		*9.2*	*9.2*	8.1	U		*8.1*	*8.1*	9.1	U		*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Phenanthrene	3100000	230000	22000			*910*	*910*	8	U		*8*	*8*	77			*9.2*	*9.2*	22		K	*8.1*	*8.1*	73			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
Pyrene	3100000	230000	7700		J	*180*	*180*	8	U		*8*	*8*	120			*9.2*	*9.2*	35		K	*8.1*	*8.1*	160			*9.1*	*9.1*	8.5	U		*8.5*	*8.5*
PCBs (ug/kg)			PCBs were not detected																													

Table 2-2
Building Debris Disposal Trench
2004 Sample Results

Analyte	Sample ID		DTSB83A					DTSB84A					DTSB85A					DTSB86A					DTSB87A					DTSB88A					DTSB89A				
	Sample Date		7/20/04					7/20/04					7/20/04					7/20/04					7/20/04					7/20/04					7/23/04				
	Sample Depth		0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																					
2-Methylnaphthalene	410000	31000	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	8.2	U		*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	8.3	U		*8.3*	*8.3*	7.4	U		*7.4*	*7.4*
Acenaphthene	6100000	470000	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	8.2	U		*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	8.3	U		*8.3*	*8.3*	13			*7.4*	*7.4*
Acenaphthylene	3100000	230000	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	8.2	U		*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	8.3	U		*8.3*	*8.3*	8.1			*7.4*	*7.4*
Anthracene	31000000	2300000	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	8.2	U		*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	15			*8.3*	*8.3*	38			*7.4*	*7.4*
Benz(a)anthracene	3900	220	14			*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	23			*8.2*	*8.2*	9.7			*8.1*	*8.1*	61			*8.3*	*8.3*	76			*7.4*	*7.4*
Benzo(a)pyrene	390	22	11			*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	25			*8.2*	*8.2*	10			*8.1*	*8.1*	52			*8.3*	*8.3*	68			*7.4*	*7.4*
Benzo(b)fluoranthene	3900	220	17			*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	45			*8.2*	*8.2*	18			*8.1*	*8.1*	84			*8.3*	*8.3*	120			*7.4*	*7.4*
Benzo(g,h,i)perylene	3100000	230000	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	20			*8.2*	*8.2*	8.5			*8.1*	*8.1*	38			*8.3*	*8.3*	55			*7.4*	*7.4*
Benzo(k)fluoranthene	39000	2200	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	14			*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	24			*8.3*	*8.3*	37			*7.4*	*7.4*
Chrysene	390000	22000	14			*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	27			*8.2*	*8.2*	11			*8.1*	*8.1*	51			*8.3*	*8.3*	76			*7.4*	*7.4*
Dibenz(a,h)anthracene	390	22	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	8.2	U		*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	8.3	U		*8.3*	*8.3*	16			*7.4*	*7.4*
Fluoranthene	4100000	310000	37			*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	61			*8.2*	*8.2*	23			*8.1*	*8.1*	150			*8.3*	*8.3*	210			*7.4*	*7.4*
Fluorene	4100000	310000	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	8.2	U		*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	8.3	U		*8.3*	*8.3*	10			*7.4*	*7.4*
Indeno(1,2,3-cd)pyrene	3900	220	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	19			*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	36			*8.3*	*8.3*	50			*7.4*	*7.4*
Naphthalene	2000000	160000	8.5	U		*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	8.2	U		*8.2*	*8.2*	8.1	U		*8.1*	*8.1*	8.3	U		*8.3*	*8.3*	7.4	U		*7.4*	*7.4*
Phenanthrene	3100000	230000	26			*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	21			*8.2*	*8.2*	8.5			*8.1*	*8.1*	76			*8.3*	*8.3*	110			*7.4*	*7.4*
Pyrene	3100000	230000	22			*8.5*	*8.5*	8.6	U		*8.6*	*8.6*	8.8	U		*8.8*	*8.8*	40			*8.2*	*8.2*	15			*8.1*	*8.1*	94			*8.3*	*8.3*	130			*7.4*	*7.4*
PCBs (ug/kg)			PCBs were not detected																																		

12 J Shading and black font indicates a i-RBC exceedance.

12 J Bold outline indicates a r-RBC exceedance.

12 *12* Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.

The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.

Inorganic results below background UTLs are not indicated as exceedances on the table.

RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

3.0 IGNITER ASSEMBLY AREA

3.1 Site Description and History

The IAA is located in the western portion of the NRU, west of the RY and north of the WBG (**Figure 1-1**). The original site was approximately 1,000 ft long by 250 ft wide. Each of the eight igniter assembly buildings (8102-1 through 8102-8) in the original site is approximately 100 ft long by 20 ft wide with loading rooms along both sides of a central cement wall. The wooden portions of the structures, including the roofing, have been removed and the cement walls, floors, and foundations remain. The central wall and the walls dividing the rooms are constructed of reinforced cement (referred to as "blastproof" cement). The floors in these buildings are covered with a cement-like mixture containing heavy metals and asbestos. This type of flooring was used in these buildings because it is electrically conductive and prevents the buildup of static electricity, which could ignite explosive-components assembled in the buildings. The removal of the walls and roofs from the buildings has exposed the flooring, and caused it to degrade. Weathering of the flooring is evidenced by a red leachate that has migrated into the surrounding soil.

Additional site visits and data analysis indicated that there were additional areas/buildings associated with the IAA to the north and south. These buildings appear to have been for shipping and receiving of materials for the IAA. The presence of conductive flooring indicates that the buildings handled explosive materials. The IAA site boundary was expanded prior to the 2002 Investigation to encompass these areas. The new site boundaries are shown on **Figure 1-1**.

The areas between the main assembly building foundations are generally flat with grassy depressions that are wooded with second growth pine and cedar tree seedlings where previously maintained grassy areas have been allowed to revert to more natural conditions. A raised sidewalk runs the length of the area on the northwest side of the assembly building foundations and connects the assembly building foundations with various outbuildings, including storage buildings for inert materials and magazines for explosive components. A change-house/canteen (Building 8101) was also connected via sidewalks to the assembly buildings. Building 8101 has been removed to its foundation. Vegetation in the remaining areas is limited to grass.

3.2 Summary of Previous Investigations

Several previous investigations have been conducted at the IAA that concluded that the deteriorating conductive flooring is leaching metals into the soil surrounding the buildings. Elevated constituents (primarily metals) in soil surrounding the buildings appear to have low mobility and concentrations decrease rapidly with depth or distance from the structures. These previous investigations are summarized in detail in the New River Unit Investigation Report (Shaw, 2003).

3.3 2004 Additional Delineation Sampling

No additional activities were performed at the IAA during the 2004 Investigation.

3.4 2007 Groundwater Investigation

Four groundwater monitoring wells were installed at the IAA in areas suspected to be down gradient from the site. One of these wells (IAAMW-01) was installed near the buildings with conductive flooring. This well was installed at the bedrock-overburden interface (34 ft bgs). One well (IAAMW-02) was installed downgradient from the site to the southwest, near a

photolineament trending to the southwest. This well was installed in the bedrock at a total depth of 160 ft bgs. A third well (IAAMW-03) was installed near the southeast corner of the IAA at a depth of 77 ft bgs. The fourth well (IAAMW-04) was installed near the unnamed creek that drains the western portion of the NRU. This well was drilled to a depth of 88 ft bgs. The locations of these wells are illustrated on **Figure 1-1.**

One round of groundwater samples was collected in July 2007. The wells were sampled and analyzed for TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC, and TOX. Well IAAMW-01 was a slow producer and insufficient volume was collected for the full suite analysis. This well was sampled for TCL VOCs, metals and perchlorate. Positive detections from the well samples are presented in **Table 1-2.** Laboratory Form Is, listing all analyzed compounds, are included in the Data Validation reports in **Appendix D.**

4.0 BAG LOADING AREA

4.1 Site Description and History

The BLA is located on a topographic high of approximately 2,090 ft mean sea level (msl) along the southwestern property boundary of the NRU, south of the RY (**Figure 1-1**). The site is approximately 1,400 ft long by 800 ft wide and consists of former process buildings and support structures. The areas between the buildings are generally flat. Vegetation is mostly limited to grass and small shrubs.

The site was developed to run two powder bag loading production lines. The production and process flow of the two lines were set up to be identical. The area was active from approximately 1941-1943. Process equipment and wooden walls and roofs have been removed. What remains are concrete foundations and walls. The floors in these buildings contain a conductive flooring material, which indicates that explosive material was handled. The flooring has degraded to varying degrees and red leachate has migrated onto the surrounding soil.

4.2 Summary of Previous Investigations

Similarly to the IAA, environmental concerns at the BLA have focused on the deteriorating conductive flooring and the red leachate that is staining the soil around the buildings. Elevated constituents (primarily metals) in soil surrounding the buildings appear to have low mobility and concentrations decrease rapidly with depth or distance from the structures. These previous investigations are summarized in detail in the New River Unit Investigation Report (Shaw, 2003).

4.3 2004 Additional Delineation Sampling

No additional activities were performed at the BLA during the 2004 Investigation.

4.4 2007 Groundwater Investigation

Two wells were installed at the BLA to provide an initial, baseline assessment of groundwater quality under the site and downgradient of the site. One of the wells (BLAMW-01) was installed near the center of the site, within the "L" formed by Building 405. The second well was installed downgradient from Building 405, on the hillside sloping down to the unnamed creek. The locations of these wells are illustrated on **Figure 1-1**. Bedrock was encountered at a relatively shallow depth in these borings. Wells were installed in the bedrock at the first encountered water, at depths of 221 ft bgs (BLAMW-01) and 151 ft bgs (BLAMW-02). One round of groundwater samples was collected. Since groundwater data has not been collected in any previous investigations, wells will be sampled and analyzed for TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC, and TOX. Positive detections from the well samples are presented in **Table 1-2.** Laboratory Form Is, listing all analyzed compounds, are included in the Data Validation Reports in **Appendix D.**

5.0 NORTHERN BURNING GROUND

5.1 Site Description and History

The NBG is located in the northern portion of the NRU, east of Gate 20, along Guard Road (**Figure 1-1**). The approximate area of investigation at the burning ground is 200 ft long by 120 ft wide. A dirt road follows the outer perimeter of the NBG and defines the outermost boundary of the site. The NBG is currently heavily wooded and appears to have been in limited use as a burning ground. There are no structures associated with the site and burning activities took place on the ground. Soil reworking, such as berms, is not evident at the site. Actual burning appears to have been conducted in a small area at the center of the site, although visible evidence of burning is no longer apparent. The site location and the monitoring well locations are shown on **Figure 1-1**.

5.2 Summary of Previous Investigations

Evaluating the combined chemical dataset from the NBG investigations, the chemical parameters of concern are:

- ***PCBs.*** Aroclor-1254 in surface soil; and,
- ***Metals.*** Lead, chromium, and arsenic in surface soil.

VOCs, non-PAH SVOCs, herbicides, explosive compounds, dioxin/furans, and pesticides were detected, but did not exceed residential screening levels; therefore, these compounds are not a concern at the NBG study area. One PAH [benzo(a)pyrene] was detected at a concentration greater than its residential screening level, but below its industrial screening level. In the main burn area, lead, chromium, arsenic, iron, and Aroclor-1254 were detected above their respective industrial screening criteria in burn area surface soil.

5.3 2004 Additional Delineation Sampling

Activities at the NBG were intended to bound the horizontal and vertical extent of elevated metals within the main burning area. Concentrations of lead were generally higher than other metals. Because lead is present more consistently and at higher concentrations within the main burning area, it was selected as an indicator metal to define the extent of contamination. The objective of the investigation was to delineate lead concentrations greater than the residential screening level (400 mg/kg). To accomplish this objective, soil samples were field screened for lead using X-ray fluorescence (XRF), and confirmation samples were collected at the extent of lead as bound by the XRF sampling. The confirmation samples were analyzed at an offsite laboratory for TAL metals. Subsurface soil samples were collected at three subsurface intervals to assess the vertical mobility and extent of lead in the subsurface. A summary of the samples is presented in **Table 5-1**.

5.3.1 XRF Screening

XRF analysis provides a field analytical method for analysis of lead in soil. XRF is capable of detecting lead in soil down to 20 mg/kg. Initially, samples were collected from 12 locations around the perimeter of elevated lead defined by previous samples. Samples were collected, stepping outward along grid lines, until sample concentrations were below 150 mg/kg. Because the XRF is a screening tool, 150 mg/kg was considered a conservative value to ensure that actual, laboratory confirmed concentrations were below the residential screening value (400 mg/kg) for lead. XRF results are presented on **Figure 5-1**. Three colors were used to shown

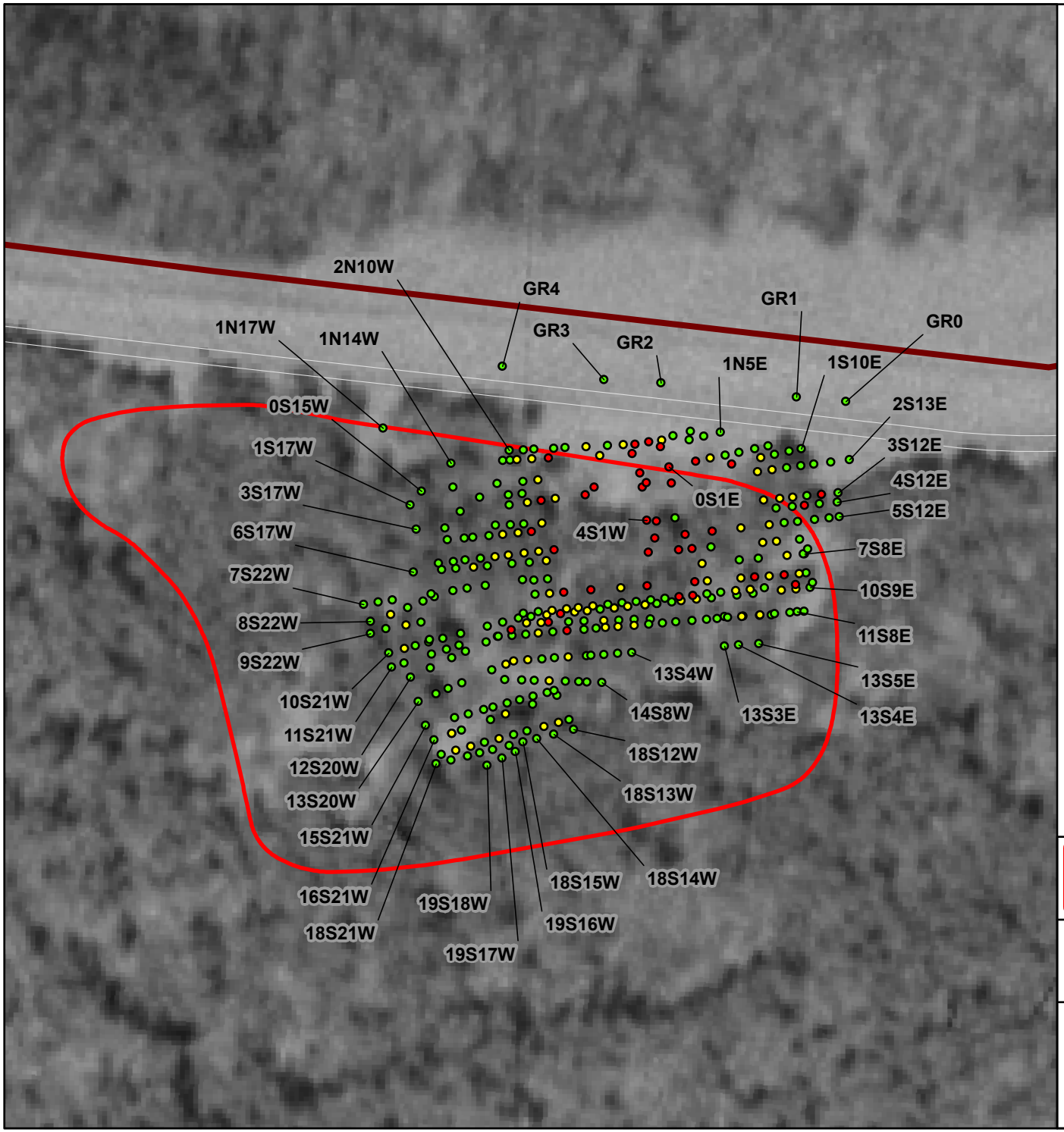
sample concentrations. Green dots represent values less than 200 mg/kg; yellow dots represent values less than 400 mg/kg, but greater than 200 mg/kg; and red dots represent concentrations greater than 400 mg/kg. XRF screening results are tabulated in **Table 5-2**

5.3.2 Soil Sampling

Once the extent of soil with lead concentrations greater than 400 mg/kg has been delineated through XRF analysis, fourteen confirmation surface soil samples were collected and analyzed at an offsite laboratory for TAL metals and confirmed that the extent of lead in surface soil was bound. In addition to the confirmation samples; samples were collected from six soil borings near the center of the main burning area to assess the vertical extent of elevated lead in soil. Four samples were collected from each of the six soil boring locations (**Figure 5-2**), at the surface (0-0.5 ft bgs), 1-3 ft bgs, 3-5 ft bgs, and 5-7 ft bgs. Results from these samples are presented on **Table 5-3.**

Table 5-1
2004 Sampling and Analysis
Northern Burning Ground

Media	Number of Samples	Analysis	Objective
Surface Soil – XRF	291	Lead (XRF)	Define extent of lead in surface soil
Surface Soil	14	TAL Metals, TCL PCBs	Confirm extent of lead as defined by XRF and collect surface soil at boring locations
Subsurface Soil	18	TAL Metals, TCL PCBs	Confirm extent of lead in subsurface soil
Sediment	2	TAL Metals, TCL PCBs	Confirm that drainage ditch along the road is not a migration pathway for NBG contaminants.



LEGEND

- Sample Location (XRF Result < 200 mg/kg)
- Sample Location (XRF Result 200-400 mg/kg)
- Sample Location (XRF Result > 400 mg/kg)
- Road
- Northern Burning Ground Boundary
- NRU Installation Boundary

Note:
1) Aerial photo, dated 25 May 2000, was obtained from the Army Topographic Engineering Center.

N

Scale:
0 50 100 200 Feet

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 5-1
XRF Results at the
Northern Burning Ground
Radford Army Ammunition Plant
Radford, VA

ArcGIS File: RFAAP_Fig5-1_NRU_NBG_XRF_Results.mxd (9/4/2007 1:59:42 PM)

Table 5-3
Northern Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			NBGSB20A					NBGSB20B					NBGSB20C					NBGSB20D					NBGSB21A				
	Sample Date			7/20/04					7/20/04					7/20/04					7/20/04					7/20/04				
	Sample Depth			0-0.5					1-3					3-5					5-7					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (ug/kg)																												
PCB-1254	1400	156	na	230			*8.6*	*40*	43	U		*9.2*	*43*	46	U		*9.9*	*46*	48	U		*10*	*48*	1300			*35*	*160*
Metals (mg/kg)																												
Aluminum	100000	7800	40041	15000			*1.3*	*19.7*	33000			*1.3*	*19.6*	**51400**			*1.4*	*21.7*	**48800**			*1.3*	*20.2*	17000			*1.1*	*17.4*
Antimony	41	3.1	na	3.3	UN	UL	*3.3*	*19.7*	0.32	UN		*0.32*	*2*	0.82	BN	J	*0.36*	*2.2*	0.67	UN		*0.67*	*4*	5.7	UN		*5.7*	*34.7*
Arsenic	1.9	0.43	15.8	6.8	B	J	*3.7*	*19.7*	10.4			*0.37*	*2*	**16.1**			*0.41*	*2.2*	**17.5**			*0.38*	*2*	6.6	U		*6.6*	*34.7*
Barium	20000	1600	209	90.6			*0.016*	*0.49*	20.6			*0.016*	*0.49*	22.8			*0.017*	*0.54*	20.6			*0.032*	*1*	176			*0.014*	*0.43*
Beryllium	200	16	1.02	0.54			*0.013*	*0.2*	0.45			*0.013*	*0.2*	0.72			*0.014*	*0.22*	0.78			*0.013*	*0.2*	0.54			*0.011*	*0.17*
Cadmium	51	3.9	0.69	**0.76**			*0.034*	*0.59*	0.45	B	J	*0.034*	*0.59*	**0.78**			*0.038*	*0.65*	**0.75**	**B**	**J**	*0.071*	*1.2*	**2.4**			*0.03*	*0.52*
Calcium	na	na	na	14600	*		*7.6*	*98.5*	545	*		*7.5*	*98.2*	277	*		*8.3*	*109*	79.2	B*	J	*7.8*	*101*	21800	*		*6.7*	*86.8*
Chromium	310	23	65.3	**1000**			*0.45*	*4.9*	42.6			*0.045*	*0.49*	54.8			*0.05*	*0.54*	55.8			*0.093*	*1*	**1090**			*0.8*	*8.7*
Cobalt	na	na	72.3	14.6			*0.086*	*0.49*	3			*0.085*	*0.49*	6.8			*0.095*	*0.54*	6.6			*0.18*	*1*	17.8			*1.5*	*8.7*
Copper	4100	310	53.5	43			*0.087*	*0.99*	17.3			*0.086*	*0.98*	30.8			*0.096*	*1.1*	29			*0.18*	*2*	**69.5**			*0.076*	*0.87*
Iron	72000	5500	50962	19500			*3.2*	*14.8*	39400			*3.2*	*14.7*	**55200**			*3.5*	*16.3*	**55600**			*6.5*	*30.3*	20300			*2.8*	*13*
Lead	800	400	26.8	**11200**			*1.3*	*9.9*	15.9			*0.13*	*0.98*	**34**			*0.14*	*1.1*	**40.1**			*0.26*	*2*	**16500**			*2.3*	*17.4*
Magnesium	na	na	na	5530	*	J	*0.92*	*24.6*	690	*	J	*0.91*	*24.6*	755	*	J	*1*	*27.2*	669	*	J	*0.94*	*25.3*	11300	*	J	*16.2*	*434*
Manganese	2000	160	2543	499			*0.016*	*0.49*	55.1			*0.016*	*0.49*	135			*0.017*	*0.54*	156			*0.032*	*1*	422			*0.014*	*0.43*
Mercury	31	2.3	0.13	0.045			*0.017*	*0.033*	**0.17**			*0.018*	*0.036*	**0.16**			*0.017*	*0.035*	**0.13**			*0.021*	*0.042*	0.039			*0.014*	*0.029*
Nickel	2000	160	62.8	11			*0.06*	*0.99*	11.3			*0.06*	*0.98*	24.2			*0.066*	*1.1*	25.5			*0.062*	*1*	10.8			*0.053*	*0.87*
Potassium	na	na	na	827	N*	K	*2.9*	*24.6*	878	N*		*2.9*	*24.6*	1250	N*		*3.2*	*27.2*	969	N*		*3*	*25.3*	1050	N*		*2.6*	*21.7*
Selenium	510	39	na	0.63	U		*0.63*	*2*	1.2	B	J	*0.63*	*2*	1.3	B	J	*0.7*	*2.2*	1.3	U		*1.3*	*4*	0.56	U		*0.56*	*1.7*
Silver	510	39	na	0.13	U		*0.13*	*0.3*	0.13	U		*0.13*	*0.29*	0.14	U		*0.14*	*0.33*	0.26	U		*0.26*	*0.61*	0.11	U		*0.11*	*0.26*
Sodium	na	na	na	390	B	B	*320*	*2460*	70.2	B	B	*31.9*	*246*	72.1	B	B	*35.3*	*272*	79.1	B	B	*65.7*	*505*	937	B	B	*564*	*4340*
Thallium	7.2	0.55	2.11	0.63	B	J	*0.38*	*3*	0.38	U		*0.38*	*2.9*	0.42	U		*0.42*	*3.3*	0.79	U		*0.79*	*6.1*	6.8	U		*6.8*	*52.1*
Vanadium	102	7.8	108	34.6			*0.81*	*9.9*	78.1			*0.081*	*0.98*	103			*0.089*	*1.1*	96.6			*0.17*	*2*	35.9			*1.4*	*17.4*
Zinc	31000	2300	202	**1700**			*5.6*	*19.7*	19.7			*0.56*	*2*	31.9			*0.62*	*2.2*	31.1			*1.2*	*4*	**6090**			*9.9*	*34.7*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 J	Bold, underlined font indicates a Background exceedance.
12 12	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 5-3
Northern Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			NBGSB21B					NBGSB21C					NBGSB21D					NBGSB22A					NBGSB22B				
	Sample Date			7/20/04					7/20/04					7/20/04					7/20/04					7/20/04				
	Sample Depth			1-3					3-5					5-7					0-0.5					1-3				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (ug/kg)																												
PCB-1254	1400	156	na	41	U		*8.9*	*41*	180			*8.5*	*40*	44	U		*9.5*	*44*	4600			*170*	*810*	39	U		*8.5*	*39*
Metals (mg/kg)																												
Aluminum	100000	7800	40041	15500			*1.1*	*17.1*	16400			*1.1*	*17.3*	36900			*1.3*	*20.4*	12700			*1.1*	*17.7*	13700			*1.2*	*18.5*
Antimony	41	3.1	na	0.39	BN	J	*0.28*	*1.7*	0.88	BN	J	*0.29*	*1.7*	0.96	BN	J	*0.34*	*2*	25.5	BN	B	*14.6*	*88.3*	0.37	BN	J	*0.31*	*1.9*
Arsenic	1.9	0.43	15.8	6.5			*0.33*	*1.7*	4.9			*0.33*	*1.7*	13.3			*0.39*	*2*	**36.6**	**B**	**J**	*16.8*	*88.3*	4.1			*0.35*	*1.9*
Barium	20000	1600	209	46.5			*0.014*	*0.43*	41.6			*0.014*	*0.43*	25.9			*0.016*	*0.51*	**618**			*0.014*	*0.44*	25.9			*0.015*	*0.46*
Beryllium	200	16	1.02	0.47			*0.011*	*0.17*	0.26			*0.011*	*0.17*	0.59			*0.013*	*0.2*	0.47			*0.011*	*0.18*	0.29			*0.012*	*0.19*
Cadmium	51	3.9	0.69	0.27	B	J	*0.03*	*0.51*	0.37	B	J	*0.03*	*0.52*	0.58	B	J	*0.036*	*0.61*	**10.6**			*0.031*	*0.53*	0.19	B	J	*0.032*	*0.56*
Calcium	na	na	na	774	*		*6.6*	*85.6*	766	*		*6.6*	*86.6*	347	*		*7.8*	*102*	15000	*		*6.8*	*88.3*	820	*		*7.1*	*92.6*
Chromium	310	23	65.3	32.9			*0.039*	*0.43*	**352**			*0.04*	*0.43*	53.1			*0.047*	*0.51*	**9690**			*2*	*22.1*	23			*0.043*	*0.46*
Cobalt	na	na	72.3	4.5			*0.075*	*0.43*	4.6			*0.075*	*0.43*	3.5			*0.089*	*0.51*	**85.2**			*3.8*	*22.1*	4.1			*0.081*	*0.46*
Copper	4100	310	53.5	9.1			*0.075*	*0.86*	16.1			*0.076*	*0.87*	17.6			*0.09*	*1*	**567**			*0.078*	*0.88*	4			*0.081*	*0.93*
Iron	72000	5500	50962	19700			*2.8*	*12.8*	17700			*2.8*	*13*	46400			*3.3*	*15.3*	40400			*2.9*	*13.3*	16700			*3*	*13.9*
Lead	800	400	26.8	**30.4**			*0.11*	*0.86*	**4090**			*0.56*	*4.3*	24.7			*0.13*	*1*	**111000**			*11.5*	*88.3*	**27.6**			*0.12*	*0.93*
Magnesium	na	na	na	547	*	J	*0.8*	*21.4*	878	*	J	*0.81*	*21.6*	864	*	J	*0.95*	*25.5*	8340	*	J	*41.1*	*1100*	575	*	J	*0.86*	*23.1*
Manganese	2000	160	2543	621			*0.014*	*0.43*	47.7			*0.014*	*0.43*	62.1			*0.016*	*0.51*	435			*0.014*	*0.44*	182			*0.015*	*0.46*
Mercury	31	2.3	0.13	0.029	B	J	*0.018*	*0.035*	0.04			*0.017*	*0.034*	**0.25**			*0.019*	*0.039*	0.031	B	J	*0.017*	*0.034*	0.039			*0.016*	*0.031*
Nickel	2000	160	62.8	7.9			*0.052*	*0.86*	5.5			*0.053*	*0.87*	13.9			*0.062*	*1*	21			*0.054*	*0.88*	4.2			*0.056*	*0.93*
Potassium	na	na	na	405	N*		*2.6*	*21.4*	608	N*		*2.6*	*21.6*	939	N*		*3*	*25.5*	1190	N*		*2.6*	*22.1*	514	N*		*2.8*	*23.1*
Selenium	510	39	na	0.72	B	J	*0.55*	*1.7*	0.56	B	J	*0.55*	*1.7*	1.4	B	J	*0.65*	*2*	0.57	U		*0.57*	*1.8*	0.68	B	J	*0.59*	*1.9*
Silver	510	39	na	0.11	U		*0.11*	*0.26*	0.11	U		*0.11*	*0.26*	0.13	B	B	*0.13*	*0.31*	0.99			*0.11*	*0.27*	0.12	U		*0.12*	*0.28*
Sodium	na	na	na	77	B	B	*27.8*	*214*	141	U		*141*	*1080*	84.7	B	B	*33.2*	*255*	2020	B	B	*1440*	*11000*	73.7	B	B	*30.1*	*231*
Thallium	7.2	0.55	2.11	0.33	U		*0.33*	*2.6*	0.46	B	J	*0.34*	*2.6*	0.4	U		*0.4*	*3.1*	17.2	U		*17.2*	*133*	0.36	U		*0.36*	*2.8*
Vanadium	102	7.8	108	38.6			*0.07*	*0.86*	37.5			*0.071*	*0.87*	86.5			*0.084*	*1*	40.5	B	J	*3.6*	*44.2*	35.3			*0.076*	*0.93*
Zinc	31000	2300	202	29.6			*0.49*	*1.7*	**647**			*2.5*	*8.7*	23.1			*0.58*	*2*	**15800**			*25.2*	*88.3*	14.2			*0.53*	*1.9*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 J	Bold, underlined font indicates a Background exceedance.
12 12	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 5-3
Northern Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			NBGSB22C					NBGSB22D					NBGSB23A					NBGSB23B					NBGSB23C				
	Sample Date			7/20/04					7/20/04					7/20/04					7/20/04					7/20/04				
	Sample Depth			3-5					5-7					0-0.5					1-3					3-5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (ug/kg)																												
PCB-1254	1400	156	na	41	U		*8.9*	*41*	46	U		*10*	*46*	39	U		*8.4*	*39*	40	U		*8.6*	*40*	40	U		*8.6*	*40*
Metals (mg/kg)																												
Aluminum	100000	7800	40041	33400			*1.1*	*16.4*	**54900**			*2.8*	*44.5*	17300			*1.1*	*17*	26400			*1.2*	*18*	21000			*1.1*	*17.5*
Antimony	41	3.1	na	0.71	BN	J	*0.27*	*1.6*	0.68	BN	L	*0.37*	*2.2*	0.86	BN	B	*0.28*	*1.7*	0.53	BN	J	*0.3*	*1.8*	0.51	BN	J	*0.29*	*1.8*
Arsenic	1.9	0.43	15.8	10.2			*0.31*	*1.6*	10.1			*0.42*	*2.2*	6.3			*0.32*	*1.7*	7.8			*0.34*	*1.8*	7.3			*0.33*	*1.8*
Barium	20000	1600	209	23.8			*0.013*	*0.41*	24.1			*0.018*	*0.56*	36.6			*0.014*	*0.42*	21.1			*0.014*	*0.45*	16.2			*0.014*	*0.44*
Beryllium	200	16	1.02	0.58			*0.011*	*0.16*	**1.2**			*0.014*	*0.22*	0.36			*0.011*	*0.17*	0.37			*0.012*	*0.18*	0.3			*0.011*	*0.18*
Cadmium	51	3.9	0.69	0.029	U		*0.029*	*0.49*	0.039	U		*0.039*	*0.67*	0.03	U		*0.03*	*0.51*	0.031	U		*0.031*	*0.54*	0.031	U		*0.031*	*0.53*
Calcium	na	na	na	996			*6.3*	*82.1*	76.1	B	B	*8.5*	*111*	1930			*6.5*	*84.9*	440			*6.9*	*89.9*	122			*6.7*	*87.7*
Chromium	310	23	65.3	53.6			*0.038*	*0.41*	41.3			*0.051*	*0.56*	50.8			*0.039*	*0.42*	54.3			*0.041*	*0.45*	31.8			*0.04*	*0.44*
Cobalt	na	na	72.3	3.3			*0.071*	*0.41*	6.5			*0.097*	*0.56*	3.9			*0.074*	*0.42*	3.7			*0.078*	*0.45*	3.3			*0.076*	*0.44*
Copper	4100	310	53.5	16.2			*0.072*	*0.82*	30			*0.098*	*1.1*	10.8			*0.075*	*0.85*	10.6			*0.079*	*0.9*	8.5			*0.077*	*0.88*
Iron	72000	5500	50962	38500			*2.7*	*12.3*	45400			*3.6*	*16.7*	20400			*2.8*	*12.7*	27400			*2.9*	*13.5*	25700			*2.8*	*13.2*
Lead	800	400	26.8	**143**	*****	**J**	*0.11*	*0.82*	**34.9**	*****	**J**	*0.14*	*1.1*	**348**	*****	**J**	*0.11*	*0.85*	**147**	*****	**J**	*0.12*	*0.9*	**50.1**	*****	**J**	*0.11*	*0.88*
Magnesium	na	na	na	1100			*0.76*	*20.5*	1120			*1*	*27.8*	1330			*0.79*	*21.2*	683			*0.84*	*22.5*	372			*0.82*	*21.9*
Manganese	2000	160	2543	63.4			*0.013*	*0.41*	74.6			*0.018*	*0.56*	110			*0.014*	*0.42*	39.2			*0.014*	*0.45*	63.7			*0.014*	*0.44*
Mercury	31	2.3	0.13	**0.2**	*****	**J**	*0.018*	*0.036*	0.1	*	J	*0.019*	*0.038*	0.035	*	J	*0.015*	*0.031*	0.089	*	J	*0.016*	*0.032*	0.041	*	J	*0.014*	*0.027*
Nickel	2000	160	62.8	12.7			*0.05*	*0.82*	23.2			*0.068*	*1.1*	7.5			*0.052*	*0.85*	9.7			*0.055*	*0.9*	8			*0.054*	*0.88*
Potassium	na	na	na	1080			*2.4*	*20.5*	1080			*3.3*	*27.8*	691			*2.5*	*21.2*	864			*2.7*	*22.5*	580			*2.6*	*21.9*
Selenium	510	39	na	0.53	U		*0.53*	*1.6*	0.71	U		*0.71*	*2.2*	0.54	U		*0.54*	*1.7*	0.68	B	J	*0.58*	*1.8*	0.65	B	J	*0.56*	*1.8*
Silver	510	39	na	0.11	U		*0.11*	*0.25*	0.14	U		*0.14*	*0.33*	0.11	U		*0.11*	*0.25*	0.12	U		*0.12*	*0.27*	0.11	U		*0.11*	*0.26*
Sodium	na	na	na	52.1	B	B	*26.7*	*205*	60.4	B	B	*36.2*	*278*	104	B	B	*27.6*	*212*	65.5	B	B	*29.2*	*225*	41.3	B	B	*28.5*	*219*
Thallium	7.2	0.55	2.11	1.2	B	B	*0.32*	*2.5*	0.71	B	B	*0.43*	*3.3*	0.33	U		*0.33*	*2.5*	0.35	U		*0.35*	*2.7*	0.34	U		*0.34*	*2.6*
Vanadium	102	7.8	108	76.8			*0.067*	*0.82*	84.9			*0.091*	*1.1*	42.9			*0.07*	*0.85*	56.1			*0.074*	*0.9*	48.2			*0.072*	*0.88*
Zinc	31000	2300	202	45.5			*0.47*	*1.6*	31			*0.63*	*2.2*	159			*0.48*	*1.7*	31.1			*0.51*	*1.8*	23			*0.5*	*1.8*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 J	Bold, underlined font indicates a Background exceedance.
12 12	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 5-3
Northern Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			NBGSB23D					NBGSB24A					NBGSB24B					NBGSB24C					NBGSB24D				
	Sample Date			7/20/04					7/20/04					7/20/04					7/20/04					7/20/04				
	Sample Depth			5-7					0-0.5					1-3					3-5					5-7				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (ug/kg)																												
PCB-1254	1400	156	na	40	U		*8.6*	*40*	140			*8.2*	*38*	40	U		*8.6*	*40*	39	U		*8.5*	*39*	39	U		*8.3*	*39*
Metals (mg/kg)																												
Aluminum	100000	7800	40041	18000			*1.2*	*18.2*	13000			*1.1*	*16.5*	13500			*1.2*	*18.4*	13200			*1.1*	*16.9*	16000			*1.1*	*17.4*
Antimony	41	3.1	na	0.33	BN	J	*0.3*	*1.8*	0.75	BN	B	*0.27*	*1.7*	0.53	BN	J	*0.3*	*1.8*	0.28	UN		*0.28*	*1.7*	0.41	BN	J	*0.29*	*1.7*
Arsenic	1.9	0.43	15.8	4.5			*0.35*	*1.8*	5.6			*0.31*	*1.7*	7.2			*0.35*	*1.8*	3.9			*0.32*	*1.7*	3.6			*0.33*	*1.7*
Barium	20000	1600	209	14.6			*0.015*	*0.45*	97.1			*0.013*	*0.41*	48.1			*0.015*	*0.46*	52.4			*0.014*	*0.42*	27.3			*0.014*	*0.43*
Beryllium	200	16	1.02	0.25			*0.012*	*0.18*	0.47			*0.011*	*0.17*	0.54			*0.012*	*0.18*	0.63			*0.011*	*0.17*	0.29			*0.011*	*0.17*
Cadmium	51	3.9	0.69	0.032	U		*0.032*	*0.55*	0.28	B	J	*0.029*	*0.5*	0.032	U		*0.032*	*0.55*	0.03	U		*0.03*	*0.51*	0.03	U		*0.03*	*0.52*
Calcium	na	na	na	27.1	B	B	*7*	*90.9*	9580			*6.3*	*82.6*	777			*7*	*91.8*	608			*6.5*	*84.5*	414			*6.7*	*86.9*
Chromium	310	23	65.3	26.9			*0.042*	*0.45*	**174**			*0.038*	*0.41*	26			*0.042*	*0.46*	16.1			*0.039*	*0.42*	18			*0.04*	*0.43*
Cobalt	na	na	72.3	2.8			*0.079*	*0.45*	6.8			*0.072*	*0.41*	5.9			*0.08*	*0.46*	10.6			*0.074*	*0.42*	3.3			*0.076*	*0.43*
Copper	4100	310	53.5	6.7			*0.08*	*0.91*	37.9			*0.073*	*0.83*	8.5			*0.081*	*0.92*	5.1			*0.074*	*0.85*	5.8			*0.076*	*0.87*
Iron	72000	5500	50962	16900			*2.9*	*13.6*	13700			*2.7*	*12.4*	23400			*3*	*13.8*	12500			*2.7*	*12.7*	15100			*2.8*	*13*
Lead	800	400	26.8	10	*	J	*0.12*	*0.91*	**1710**	*	J	*0.11*	*0.83*	**27.4**	*	J	*0.12*	*0.92*	23.2	*	J	*0.11*	*0.85*	10	*	J	*0.11*	*0.87*
Magnesium	na	na	na	296			*0.85*	*22.7*	4850			*0.77*	*20.6*	526			*0.85*	*22.9*	688			*0.79*	*21.1*	646			*0.81*	*21.7*
Manganese	2000	160	2543	36.2			*0.015*	*0.45*	407			*0.013*	*0.41*	471			*0.015*	*0.46*	501			*0.014*	*0.42*	110			*0.014*	*0.43*
Mercury	31	2.3	0.13	0.04	*	J	*0.015*	*0.029*	0.036	*	J	*0.015*	*0.03*	0.038	*	J	*0.012*	*0.024*	0.058	*	J	*0.015*	*0.029*	0.031	B*	J	*0.018*	*0.035*
Nickel	2000	160	62.8	6.7			*0.055*	*0.91*	8.1			*0.05*	*0.83*	7.7			*0.056*	*0.92*	6.6			*0.052*	*0.85*	6.1			*0.053*	*0.87*
Potassium	na	na	na	369			*2.7*	*22.7*	604			*2.5*	*20.6*	444			*2.7*	*22.9*	507			*2.5*	*21.1*	649			*2.6*	*21.7*
Selenium	510	39	na	0.58	U		*0.58*	*1.8*	0.53	U		*0.53*	*1.7*	0.59	U		*0.59*	*1.8*	0.54	U		*0.54*	*1.7*	0.56	U		*0.56*	*1.7*
Silver	510	39	na	0.12	U		*0.12*	*0.27*	0.54	U		*0.54*	*1.2*	0.12	U		*0.12*	*0.28*	0.11	U		*0.11*	*0.25*	0.11	U		*0.11*	*0.26*
Sodium	na	na	na	56.8	B	B	*29.5*	*227*	137	B	B	*134*	*1030*	74.5	B	B	*29.8*	*229*	52.9	B	B	*27.5*	*211*	47.3	B	B	*28.2*	*217*
Thallium	7.2	0.55	2.11	0.35	U		*0.35*	*2.7*	0.32	U		*0.32*	*2.5*	0.36	U		*0.36*	*2.8*	0.33	U		*0.33*	*2.5*	0.34	U		*0.34*	*2.6*
Vanadium	102	7.8	108	34			*0.075*	*0.91*	29.2			*0.068*	*0.83*	42.3			*0.075*	*0.92*	28.1			*0.069*	*0.85*	32.8			*0.071*	*0.87*
Zinc	31000	2300	202	8.9			*0.52*	*1.8*	**875**			*2.4*	*8.3*	34.8			*0.52*	*1.8*	20.1			*0.48*	*1.7*	11.1			*0.5*	*1.7*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 J	Bold, underlined font indicates a Background exceedance.
12 12	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 5-3
Northern Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			NBGSB25A					NBGSB25B					NBGSB25C					NBGSB25D					NBGSB26A				
	Sample Date			7/20/04					7/20/04					7/20/04					7/20/04					7/20/04				
	Sample Depth			0-0.5					1-3					3-5					5-7					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (ug/kg)																												
PCB-1254	1400	156	na	560			*16*	*74*	37	U		*8.1*	*37*	40	U		*8.6*	*40*	40	U		*8.7*	*40*	39	U		*8.5*	*39*
Metals (mg/kg)																												
Aluminum	100000	7800	40041	17100			*1.1*	*16.7*	11500			*1.1*	*16.9*	11600			*1.1*	*16.7*	20300			*1.1*	*17.9*	14500			*1.2*	*19.3*
Antimony	41	3.1	na	2.6	N	B	*0.28*	*1.7*	0.28	UN		*0.28*	*1.7*	0.42	BN	J	*0.28*	*1.7*	0.43	BN	J	*0.3*	*1.8*	0.79	BN	B	*0.32*	*1.9*
Arsenic	1.9	0.43	15.8	6.5			*0.32*	*1.7*	4.3			*0.32*	*1.7*	12.7			*0.32*	*1.7*	6.1			*0.34*	*1.8*	5.2			*0.37*	*1.9*
Barium	20000	1600	209	202			*0.013*	*0.42*	73.8			*0.013*	*0.42*	27.4			*0.013*	*0.42*	26			*0.014*	*0.45*	52.9	N		*0.015*	*0.48*
Beryllium	200	16	1.02	0.53			*0.011*	*0.17*	0.51			*0.011*	*0.17*	0.4			*0.011*	*0.17*	0.39			*0.012*	*0.18*	0.53			*0.013*	*0.19*
Cadmium	51	3.9	0.69	**1.4**			*0.029*	*0.5*	**0.86**			*0.03*	*0.51*	0.44	B	J	*0.029*	*0.5*	0.26	B	J	*0.031*	*0.54*	0.24	B	J	*0.034*	*0.58*
Calcium	na	na	na	37700			*6.4*	*83.5*	4170	*		*6.5*	*84.3*	941	*		*6.4*	*83.5*	1010	*		*6.9*	*89.4*	978	*		*7.4*	*96.6*
Chromium	310	23	65.3	**494**			*0.038*	*0.42*	14.9			*0.039*	*0.42*	29.6			*0.038*	*0.42*	24			*0.041*	*0.45*	24.8			*0.044*	*0.48*
Cobalt	na	na	72.3	9.7			*0.073*	*0.42*	13.4			*0.073*	*0.42*	4			*0.073*	*0.42*	2.8			*0.078*	*0.45*	5.2			*0.084*	*0.48*
Copper	4100	310	53.5	**95.4**			*0.074*	*0.84*	**313**			*0.074*	*0.84*	8.6			*0.073*	*0.84*	12			*0.079*	*0.89*	10.2			*0.085*	*0.97*
Iron	72000	5500	50962	19900			*2.7*	*12.5*	38600			*2.7*	*12.6*	42300			*2.7*	*12.5*	23400			*2.9*	*13.4*	17900	*	J	*3.1*	*14.5*
Lead	800	400	26.8	**5610**	*	J	*1.1*	*8.4*	**63.5**			*0.11*	*0.84*	24.1			*0.11*	*0.84*	11.1			*0.12*	*0.89*	**80.1**			*0.13*	*0.97*
Magnesium	na	na	na	19700			*0.78*	*20.9*	2800	*	J	*0.78*	*21.1*	658	*	J	*0.78*	*20.9*	779	*	J	*0.83*	*22.4*	908	N		*0.9*	*24.2*
Manganese	2000	160	2543	290			*0.013*	*0.42*	675			*0.013*	*0.42*	221			*0.013*	*0.42*	63.9			*0.014*	*0.45*	409	N		*0.015*	*0.48*
Mercury	31	2.3	0.13	0.04	*	J	*0.016*	*0.032*	0.021	B	J	*0.013*	*0.027*	0.06			*0.016*	*0.032*	0.078			*0.017*	*0.034*	0.031	B	J	*0.016*	*0.031*
Nickel	2000	160	62.8	13.8			*0.051*	*0.84*	7.3			*0.051*	*0.84*	4.8			*0.051*	*0.84*	8.7			*0.055*	*0.89*	8.2			*0.059*	*0.97*
Potassium	na	na	na	1430			*2.5*	*20.9*	701	N*		*2.5*	*21.1*	469	N*		*2.5*	*20.9*	793	N*		*2.7*	*22.4*	458	N		*2.9*	*24.2*
Selenium	510	39	na	0.53	U		*0.53*	*1.7*	1.4	B	J	*0.54*	*1.7*	1.5	B	J	*0.53*	*1.7*	0.57	U		*0.57*	*1.8*	0.62	U		*0.62*	*1.9*
Silver	510	39	na	0.11	U		*0.11*	*0.25*	0.11	U		*0.11*	*0.25*	0.11	U		*0.11*	*0.25*	0.12	U		*0.12*	*0.27*	0.13	U		*0.13*	*0.29*
Sodium	na	na	na	404	B	B	*271*	*2090*	142	B	B	*27.4*	*211*	69.7	B	B	*27.1*	*209*	77.4	B	B	*29.1*	*224*	69.3	B	B	*31.4*	*242*
Thallium	7.2	0.55	2.11	0.33	U		*0.33*	*2.5*	0.33	U		*0.33*	*2.5*	0.33	U		*0.33*	*2.5*	0.35	U		*0.35*	*2.7*	0.38	U		*0.38*	*2.9*
Vanadium	102	7.8	108	35.4			*0.068*	*0.84*	23.9			*0.069*	*0.84*	62.1			*0.068*	*0.84*	46.3			*0.073*	*0.89*	37.6			*0.079*	*0.97*
Zinc	31000	2300	202	**4040**			*4.8*	*16.7*	**650**			*0.48*	*1.7*	20.7			*0.48*	*1.7*	17.8			*0.51*	*1.8*	95.4			*0.55*	*1.9*

12	J	Shading and black font indicates a i-RBC exceedance.
12	J	Bold outline indicates a r-RBC exceedance.
12	**J**	Bold, underlined font indicates a Background exceedance.
12	*12*	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 5-3
Northern Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			NBGSB27A					NBGSB28A					NBGSB29A					NBGSB30A					NBGSB31A				
	Sample Date			7/22/04					7/21/04					7/20/04					7/21/04					7/22/04				
	Sample Depth			0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (ug/kg)																												
PCB-1254	1400	156	na	43	U		*9.4*	*43*	42	U		*9*	*42*	40	U		*8.5*	*40*	41	U		*8.9*	*41*	44	U		*9.4*	*44*
Metals (mg/kg)																												
Aluminum	100000	7800	40041	10500			*1.4*	*22.1*	17700			*1.3*	*19.8*	15000			*1.1*	*17.6*	26600			*1.2*	*18.8*	16500			*1.2*	*18.8*
Antimony	41	3.1	na	0.36	UN	UL	*0.36*	*2.2*	0.83	BN	B	*0.33*	*2*	0.37	BN	B	*0.29*	*1.8*	0.65	BN	B	*0.31*	*1.9*	0.41	BN	B	*0.31*	*1.9*
Arsenic	1.9	0.43	15.8	4			*0.42*	*2.2*	4.3			*0.38*	*2*	2.4		B	*0.33*	*1.8*	11			*0.36*	*1.9*	5.9			*0.36*	*1.9*
Barium	20000	1600	209	52.8	N	K	*0.018*	*0.55*	126	N		*0.016*	*0.5*	158	N		*0.014*	*0.44*	35.1	N		*0.015*	*0.47*	40.6	N		*0.015*	*0.47*
Beryllium	200	16	1.02	0.47			*0.014*	*0.22*	0.57			*0.013*	*0.2*	0.74			*0.011*	*0.18*	0.71			*0.012*	*0.19*	0.39			*0.012*	*0.19*
Cadmium	51	3.9	0.69	0.086	B	J	*0.039*	*0.66*	0.52	B	J	*0.035*	*0.59*	0.42	B	J	*0.031*	*0.53*	0.19	B	J	*0.033*	*0.56*	0.24	B	J	*0.033*	*0.56*
Calcium	na	na	na	1450	*		*8.5*	*110*	81900	*		*15.2*	*198*	129000	*		*67.5*	*879*	1370	*		*7.2*	*93.9*	22500	*		*7.2*	*93.9*
Chromium	310	23	65.3	21.7			*0.051*	*0.55*	25.8			*0.046*	*0.5*	26.4			*0.04*	*0.44*	36.8			*0.043*	*0.47*	23.6			*0.043*	*0.47*
Cobalt	na	na	72.3	7.5			*0.096*	*0.55*	6.7			*0.086*	*0.5*	8.3			*0.076*	*0.44*	5.1			*0.082*	*0.47*	3.2			*0.082*	*0.47*
Copper	4100	310	53.5	8.9			*0.097*	*1.1*	26.9			*0.087*	*0.99*	39.7			*0.077*	*0.88*	16.9			*0.083*	*0.94*	11			*0.083*	*0.94*
Iron	72000	5500	50962	11700	*	J	*3.6*	*16.6*	16800	*	J	*3.2*	*14.9*	16100	*	J	*28.5*	*132*	34300	*	J	*3*	*14.1*	19100	*	J	*3*	*14.1*
Lead	800	400	26.8	**110**			*0.14*	*1.1*	**124**			*0.13*	*0.99*	**79.5**			*0.11*	*0.88*	**51**			*0.12*	*0.94*	**53.9**			*0.12*	*0.94*
Magnesium	na	na	na	983	N	K	*1*	*27.6*	39900	N		*0.92*	*24.8*	58500	N		*8.2*	*220*	1220	N		*0.87*	*23.5*	11800	N		*0.87*	*23.5*
Manganese	2000	160	2543	252	N	K	*0.018*	*0.55*	221	N		*0.016*	*0.5*	204	N		*0.014*	*0.44*	116	N		*0.015*	*0.47*	122	N		*0.015*	*0.47*
Mercury	31	2.3	0.13	0.048			*0.017*	*0.034*	0.041			*0.016*	*0.032*	0.045			*0.016*	*0.033*	0.07			*0.017*	*0.034*	0.061			*0.018*	*0.036*
Nickel	2000	160	62.8	7.2			*0.067*	*1.1*	13.1			*0.06*	*0.99*	15.4			*0.054*	*0.88*	13.8			*0.057*	*0.94*	7.8			*0.057*	*0.94*
Potassium	na	na	na	509	N	K	*3.3*	*27.6*	2210	N		*3*	*24.8*	3680	N		*2.6*	*22*	732	N		*2.8*	*23.5*	856	N		*2.8*	*23.5*
Selenium	510	39	na	0.71	U		*0.71*	*2.2*	0.63	U		*0.63*	*2*	0.56	U		*0.56*	*1.8*	0.94	B	J	*0.6*	*1.9*	0.6	U		*0.6*	*1.9*
Silver	510	39	na	0.14	U		*0.14*	*0.33*	0.13	U		*0.13*	*0.3*	0.11	U		*0.11*	*0.26*	0.12	U		*0.12*	*0.28*	0.12	U		*0.12*	*0.28*
Sodium	na	na	na	79.9	B	B	*35.9*	*276*	187	B	B	*32.2*	*248*	210	B	B	*28.6*	*220*	65	B	B	*30.5*	*235*	126	B	B	*30.5*	*235*
Thallium	7.2	0.55	2.11	0.43	U		*0.43*	*3.3*	0.39	U		*0.39*	*3*	0.34	U		*0.34*	*2.6*	0.37	U		*0.37*	*2.8*	0.37	U		*0.37*	*2.8*
Vanadium	102	7.8	108	23.8			*0.091*	*1.1*	35.7			*0.081*	*0.99*	35.5			*0.072*	*0.88*	66.2			*0.077*	*0.94*	40.4			*0.077*	*0.94*
Zinc	31000	2300	202	99.5			*0.63*	*2.2*	199			*0.56*	*2*	158			*0.5*	*1.8*	34.8			*0.54*	*1.9*	143			*0.54*	*1.9*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 J	Bold, underlined font indicates a Background exceedance.
12 12	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 5-3
Northern Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			NBGSB32A					NBGSB33A				
	Sample Date			7/19/04					7/21/04				
	Sample Depth			0-0.5					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (ug/kg)													
PCB-1254	1400	156	na	42	U		*9*	*42*	39	U		*8.3*	*39*
Metals (mg/kg)													
Aluminum	100000	7800	40041	22800			*1.3*	*20.7*	17500			*1.1*	*17.8*
Antimony	41	3.1	na	0.68	BN	B	*0.34*	*2.1*	0.39	BN	B	*0.29*	*1.8*
Arsenic	1.9	0.43	15.8	8.9			*0.39*	*2.1*	8.1			*0.34*	*1.8*
Barium	20000	1600	209	47	N		*0.017*	*0.52*	34.1	N		*0.014*	*0.44*
Beryllium	200	16	1.02	0.68			*0.013*	*0.21*	0.45			*0.012*	*0.18*
Cadmium	51	3.9	0.69	0.29	B	J	*0.036*	*0.62*	0.15	B	J	*0.031*	*0.53*
Calcium	na	na	na	2640	*		*8*	*104*	2790	*		*6.8*	*88.8*
Chromium	310	23	65.3	39.9			*0.048*	*0.52*	28			*0.041*	*0.44*
Cobalt	na	na	72.3	6.8			*0.09*	*0.52*	4			*0.077*	*0.44*
Copper	4100	310	53.5	22.8			*0.091*	*1*	11.3			*0.078*	*0.89*
Iron	72000	5500	50962	31400	*	J	*3.4*	*15.5*	23200	*	J	*2.9*	*13.3*
Lead	800	400	26.8	**159**			*0.13*	*1*	20.8			*0.12*	*0.89*
Magnesium	na	na	na	1840	N		*0.96*	*25.9*	2150	N		*0.83*	*22.2*
Manganese	2000	160	2543	211	N		*0.017*	*0.52*	137	N		*0.014*	*0.44*
Mercury	31	2.3	0.13	0.097			*0.017*	*0.033*	0.049			*0.016*	*0.031*
Nickel	2000	160	62.8	14.8			*0.063*	*1*	8.9			*0.054*	*0.89*
Potassium	na	na	na	764	N		*3.1*	*25.9*	1010	N		*2.6*	*22.2*
Selenium	510	39	na	0.66	U		*0.66*	*2.1*	0.58	B	J	*0.57*	*1.8*
Silver	510	39	na	0.13	U		*0.13*	*0.31*	0.12	U		*0.12*	*0.27*
Sodium	na	na	na	99	B	B	*33.7*	*259*	59.4	B	B	*28.9*	*222*
Thallium	7.2	0.55	2.11	0.4	U		*0.4*	*3.1*	0.35	U		*0.35*	*2.7*
Vanadium	102	7.8	108	59.1			*0.085*	*1*	46.3			*0.073*	*0.89*
Zinc	31000	2300	202	**204**			*0.59*	*2.1*	38.3			*0.51*	*1.8*

12	J	Shading and black font indicates a i-RBC exceedance.
12	J	Bold outline indicates a r-RBC exceedance.
12	**J**	Bold, underlined font indicates a Background exceedance.
12	*12*	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 5-2
Northern Burning Ground
2004 XRF Lead Results

Row ID	Sample_ID	XRF Lead Concentration mg/kg
Row 2N	2N0W	2900
	2N1E	295
	2N1W	408
	2N2E	160
	2N2W	281
	2N3E	137
	2N4W	136
	2N5W	339
	2N6W	179
	2N7W	152
	2N8W	140
	2N9W	118
Row 1N	1N11W	126
	1N14W	83.2
	1N1E	1040
	1N1W	1930
	1N3E	86.6
	1N4W	308
	1N5E	70.2
	1N7W	558
	1N8W	238
	1N9W	305
Row 0	0S11W	124
	0S13W	83.4
	0S1E	2660
	0S1W	2630
	0S3E	476
	0S4E	214
	0S5E	90.8
	0S8W	205
	0S9W	126
Row 1S	1S10E	145
	1S10W	164
	1S12W	76.2
	1S1W	5430
	1S4W	1420
	1S5E	1210
	1S7E	228
	1S8E	126
	1S9W	188
Row 2S	2S10E	130
	2S10W	168
	2S11E	132
	2S13E	89.5
	2S14W	140
	2S1E	2130
	2S1W	1690
	2S5E	2350
	2S7E	255
	2S7W	300
	2S8E	329
	2S8W	450
	2S9E	72.7
	2S9W	314
Row 9S	9S0W	11000
	9S10W	94.4
	9S18W	59.4
	9S19W	145
	9S1E	1490
	9S1W	115
	9S20W	211
	9S21W	110
	9S22W	134
	9S2E	118
	9S2W	149
	9S3W	181
	9S4E	207
	9S4W	149
	9S5E	236
	9S5W	173
	9S6E	196
	9S6W	209
	9S7W	323
	9S8E	1820
	9S8W	284
	9S9E	128
	9S9W	301
Row 10S	10S0W	300
	10S10W	244
	10S11W	69.3
	10S16W	121
	10S17W	98.4
	10S18W	124
	10S19W	160
	10S1E	243
	10S1W	92.9
	10S20W	268
	10S2E	174
	10S2W	125
	10S3W	221
	10S4E	90.9
	10S4W	336
	10S5E	165
	10S5W	392
	10S6W	162
	10S7E	330
	10S7W	264
	10S8E	254
	10S8W	243
	10S9E	105
	10S9W	510
Row 11S	11S0W	64
	11S10W	95.4
	11S11W	246
	11S12W	110
	11S13W	159
	11S16W	144
	11S17W	188

Table 5-2
Northern Burning Ground
2004 XRF Lead Results

Row ID	Sample_ID	XRF Lead Concentration mg/kg
Row 3S	3S10W	82.1
	3S11E	550
	3S11W	116
	3S12E	83.7
	3S12W	117
	3S15W	93
	3S1W	3890
	3S7E	218
	3S8E	223
	3S9E	264
	3S9W	372
Row 4S	4S10E	715
	4S10W	234
	4S11E	161
	4S11W	340
	4S12E	110
	4S12W	51.8
	4S13W	95
	4S14W	68.8
	4S15W	85.1
	4S1E	177
	4S1W	3420
	4S9E	130
	4S9W	471
Row 5S	5S10E	139
	5S10W	207
	5S11E	130
	5S11W	205
	5S12E	85.6
	5S12W	218
	5S13W	198
	5S14W	159
	5S15W	75
	5S16W	72.3
	5S1E	692
	5S1W	1020
	5S3E	685
	5S5E	299
	5S7E	312
	5S8E	85.1
	5S8W	2990
	5S9E	122
	5S9W	274
Row 6S	6S10W	70.7
	6S12W	93.6
	6S13W	208
	6S14W	181
	6S15W	89
	6S17W	63.3
	6S1E	538
	6S1W	499
	6S2E	889
	6S3E	185
	6S6E	314

Row ID	Sample_ID	XRF Lead Concentration mg/kg
Row 11S (cont'd)	11S18W	182
	11S1E	59.7
	11S2W	76.8
	11S3E	96.8
	11S4E	327
	11S4W	369
	11S5E	264
	11S5W	285
	11S6E	75.3
	11S6W	251
	11S7E	90.1
	11S7W	172
	11S8E	113
	11S8W	134
	11S9E	68.4
	11S9W	402
Row 12S	12S10W	418
	12S11W	275
	12S12W	304
	12S13W	541
	12S14W	123
	12S15W	138
	12S17W	107
	12S19W	180
	12S3E	81.1
	12S3W	119
	12S4E	170
	12S4W	102
	12S5W	137
	12S6E	91.6
	12S6W	244
	12S9W	178
Row 13S	13S10W	113
	13S11W	70.7
	13S12W	380
	13S13W	354
	13S14W	200
	13S15W	125
	13S17W	80.6
	13S18W	112
	13S3E	118
	13S4E	62.6
	13S4W	81.1
	13S5E	82.4
	13S5W	76.1
	13S6W	69.3
	13S7W	94.1
	13S8W	81.9
	13S9W	215
Row 14S	14S10W	78.6
	14S11W	95.4
	14S12W	245
	14S13W	106
	14S14W	102

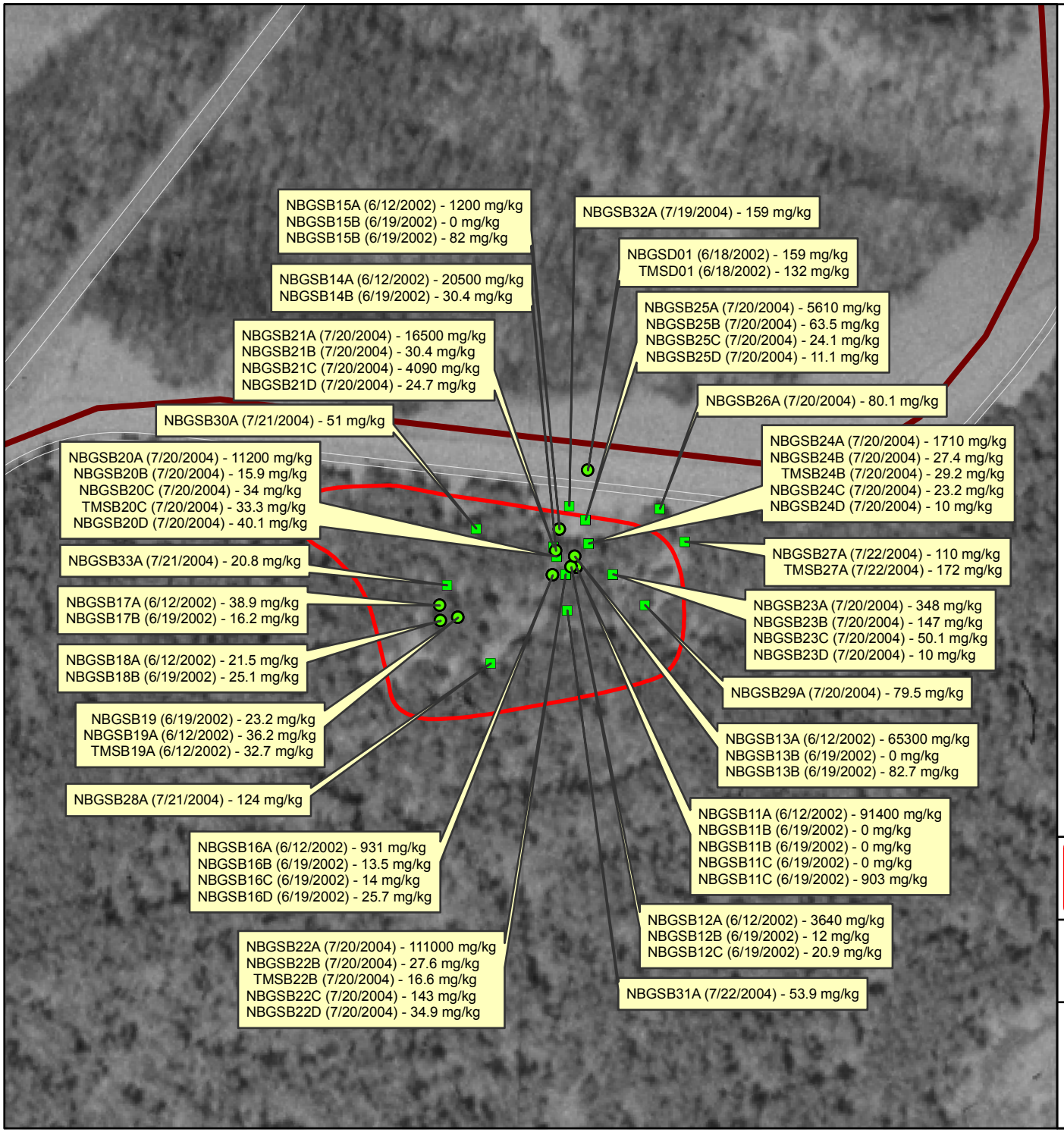
Table 5-2
Northern Burning Ground
2004 XRF Lead Results

Row ID	Sample_ID	XRF Lead Concentration mg/kg
Row 6S (cont'd)	6S7E	329
	6S8E	133
	6S8W	382
	6S9E	94.6
	6S9W	72.1
Row 7S	7S10W	110
	7S12W	89.8
	7S15W	105
	7S17W	120
	7S4E	180
	7S5E	185
	7S6E	346
	7S7E	225
	7S8E	190
	7S9E	144
Row 8S	8S17W	80.4
	8S19W	102
	8S1E	2630
	8S21W	216
	8S22W	128
	8S2E	283
	8S2W	1400
	8S4E	266
	8S4W	247
	8S5E	784
	8S6E	226
	8S6W	850
	8S7E	425
	8S8E	242
	8S8W	689
	8S9E	140
	8S9W	269

> Ind. Screening Value (800mg/kg)

> Res. Screening Value (400 mg/kg)

Row ID	Sample_ID	XRF Lead Concentration mg/kg
Row 14S (cont'd)	14S15W	105
	14S8W	80.8
	14S9W	79.9
Row 15S	15S11W	115
	15S12W	137
	15S13W	136
	15S14W	144
	15S15W	82.6
	15S16W	90.3
	15S18W	147
	15S19W	79.7
	15S21W	76.1
Row 16S	16S12W	147
	16S14W	159
	16S16W	217
	16S17W	166
	16S19W	199
	16S20W	57
	16S20W	240
	16S21W	119
Row 17S	17S12W	82.3
	17S13W	263
	17S14W	286
	17S15W	151
	17S16W	129
	17S17W	298
	17S18W	185
	17S19W	243
	17S20W	210
	17S21W	148
Row 18S	18S12W	121
	18S14W	146
	18S15W	90.5
	18S16W	122
	18S17W	153
	18S18W	81.9
	18S19W	117
	18S20W	70.5
	18S21W	93.5
	19S17W	148



LEGEND

- 2004 Lead Detect Sample Location
- 2002 Lead Detect Sample Location
- Road
- Northern Burning Ground Boundary
- NRU Installation Boundary

Note:
1) Aerial photo, dated 25 May 2000, was obtained from the Army Topographic Engineering Center.

N

Scale:
0 100 200 400 Feet

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 5-2
2002 and 2004 Lead Results
at the Northern Burning Ground
Radford Army Ammunition Plant
Radford, VA

ArcGIS File: RFAAP_Fig5-2_NRU_NBG_Lead_2002_2004_Results.mxd (9/4/2007 2:00:56 PM)

5.3.3 Sediment Sampling

Two sediment samples were collected from the drainage ditch between the NBG and the paved road to the north (Guard Road). The ditch is dry except during heavy rain events. A sample was collected in 2002 from below a culvert that drains under the paved road. Results from this sample indicated that constituents from the NBG are not being transported under the road in the drainage system. The 2004 sediment samples were collected from the ditch prior to the culvert to assess whether this portion of the ditch has been impacted (**Figure 5-2**). Results from these samples are presented in **Table 5-4.**

5.4 2007 Groundwater Investigation

One well (NBGMW-01) was installed near the center of the burning area to assess potential groundwater contamination. This well was installed in the area where the highest levels of lead were detected in soil (**Figure 5-2**). An additional well (NBGMW-02) was installed to the north, near the NRU boundary fence (**Figure 5-2**). Both of these wells were completed just below the first encountered water, at a depth of approximately 100 ft bgs. An attempt was made to install a well to the southwest, between the burning ground and a potential sink-hole. This boring was abandoned after advancing to100 ft bgs due to large voids encountered in the subsurface and no water encountered. Groundwater samples were collected and analyzed for TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC, and TOX. Positive detections from the well samples are presented in **Table 1-2.** Laboratory Form Is, listing all analyzed compounds, are included in the Data Validation Reports in **Appendix D.**

Table 5-4
Northern Burning Ground
2004 Sediment Results

Analyte	Sample ID			NBGSD02					NBGSD03					NBGSD04				
	Sample Date			7/14/04					7/16/04					7/16/04				
	Sample Depth			0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (mg/kg)																		
PCB-1254	1400	160	na	68			*8.9*	*41*	39	U		*8.3*	*39*	150			*8.8*	*41*
Metals (mg/kg)																		
Aluminum	100000	7800	40041	21400			*1.2*	*18.5*	19500			*1.1*	*17.2*	13200			*1*	*16.2*
Antimony	41	3.1	na	0.38	BN	B	*0.31*	*1.9*	1.6	BN	B	*0.28*	*1.7*	2.1	N	B	*0.27*	*1.6*
Arsenic	1.9	0.43	15.8	8.9			*0.35*	*1.9*	6.8			*0.33*	*1.7*	5.1			*0.31*	*1.6*
Barium	20000	1600	209	44.2			*0.015*	*0.46*	123			*0.014*	*0.43*	142			*0.013*	*0.41*
Beryllium	200	16	1.02	0.67	E	J	*0.012*	*0.19*	0.64	E	J	*0.011*	*0.17*	0.48	E	J	*0.011*	*0.16*
Cadmium	51	3.9	0.69	0.083	B	J	*0.032*	*0.56*	**1.7**			*0.03*	*0.52*	**1.1**			*0.028*	*0.49*
Calcium	na	na	na	2680			*7.1*	*92.5*	35700			*6.6*	*86.1*	12200			*6.2*	*81*
Chromium	310	23	65.3	38.3			*0.043*	*0.46*	**397**			*0.04*	*0.43*	**151**			*0.037*	*0.41*
Cobalt	na	na	72.3	6.2			*0.081*	*0.46*	8.9			*0.075*	*0.43*	7.5			*0.071*	*0.41*
Copper	4100	310	53.5	20.5			*0.081*	*0.93*	41.5			*0.076*	*0.86*	46.7			*0.071*	*0.81*
Iron	72000	5500	50962	31700			*3*	*13.9*	24800			*2.8*	*12.9*	14500			*2.6*	*12.2*
Lead	800	400	26.8	**146**			*0.12*	*0.93*	**3500**			*2.2*	*17.2*	**2200**			*1.1*	*8.1*
Magnesium	na	na	na	1820	N		*0.86*	*23.1*	19000	N		*0.8*	*21.5*	7930	N		*0.75*	*20.3*
Manganese	2000	160	2543	215			*0.015*	*0.46*	334			*0.014*	*0.43*	319			*0.013*	*0.41*
Mercury	31	2.3	0.13	0.1			*0.018*	*0.036*	0.048			*0.014*	*0.029*	0.051			*0.016*	*0.033*
Nickel	2000	160	62.8	14.3			*0.056*	*0.93*	13.1			*0.053*	*0.86*	10			*0.049*	*0.81*
Potassium	na	na	na	655			*2.8*	*23.1*	1530			*2.6*	*21.5*	899			*2.4*	*20.3*
Selenium	510	39	na	0.84	B	J	*0.59*	*1.9*	0.55	U		*0.55*	*1.7*	0.52	U		*0.52*	*1.6*
Sodium	na	na	na	79.9	B	B	*30.1*	*231*	560	U		*560*	*4310*	345	B	B	*263*	*2030*
Vanadium	102	7.8	108	55.8			*0.076*	*0.93*	46.3			*0.071*	*0.86*	29			*0.066*	*0.81*
Zinc	31000	2300	202	**208**			*0.53*	*1.9*	**4220**			*9.8*	*34.4*	**2630**			*4.6*	*16.2*

12	J	Shading and black font indicates a i-RBC exceedance.
12	J	Bold outline indicates a r-RBC exceedance.
12	**J**	Bold, underlined font indicates a Background exceedance.
12	*12*	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.

The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.

Inorganic results below background UTLs are not indicated as exceedances on the table.

RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

6.0 WESTERN BURNING GROUND

6.1 Site Description and History

The WBG is located in the western portion of the NRU, west of the RY and south of the IAA (**Figure 1-1**). The WBG was used as a burning ground to decontaminate explosives-contaminated material. The site is no longer active. The main burn area was approximately 170 ft long by 100 ft wide and is surrounded on three sides by an approximately 4 ft high earthen berm. A dirt road runs parallel to the open (unbermed) side, leading north to the main road and south to the top of a steep slope above an unnamed pond. The pond was constructed during the early 1990s and is fed by Wiggins Spring, a natural spring located at the head of the pond. The pond also collects runoff from the boundary road and from off the Installation through a series of storm water culverts. The pond drains via a constant level drain into the unnamed creek south of the WBG. A site map and the results of previous investigations are shown on **Figure 6-1**.

6.2 Summary of Previous Investigations

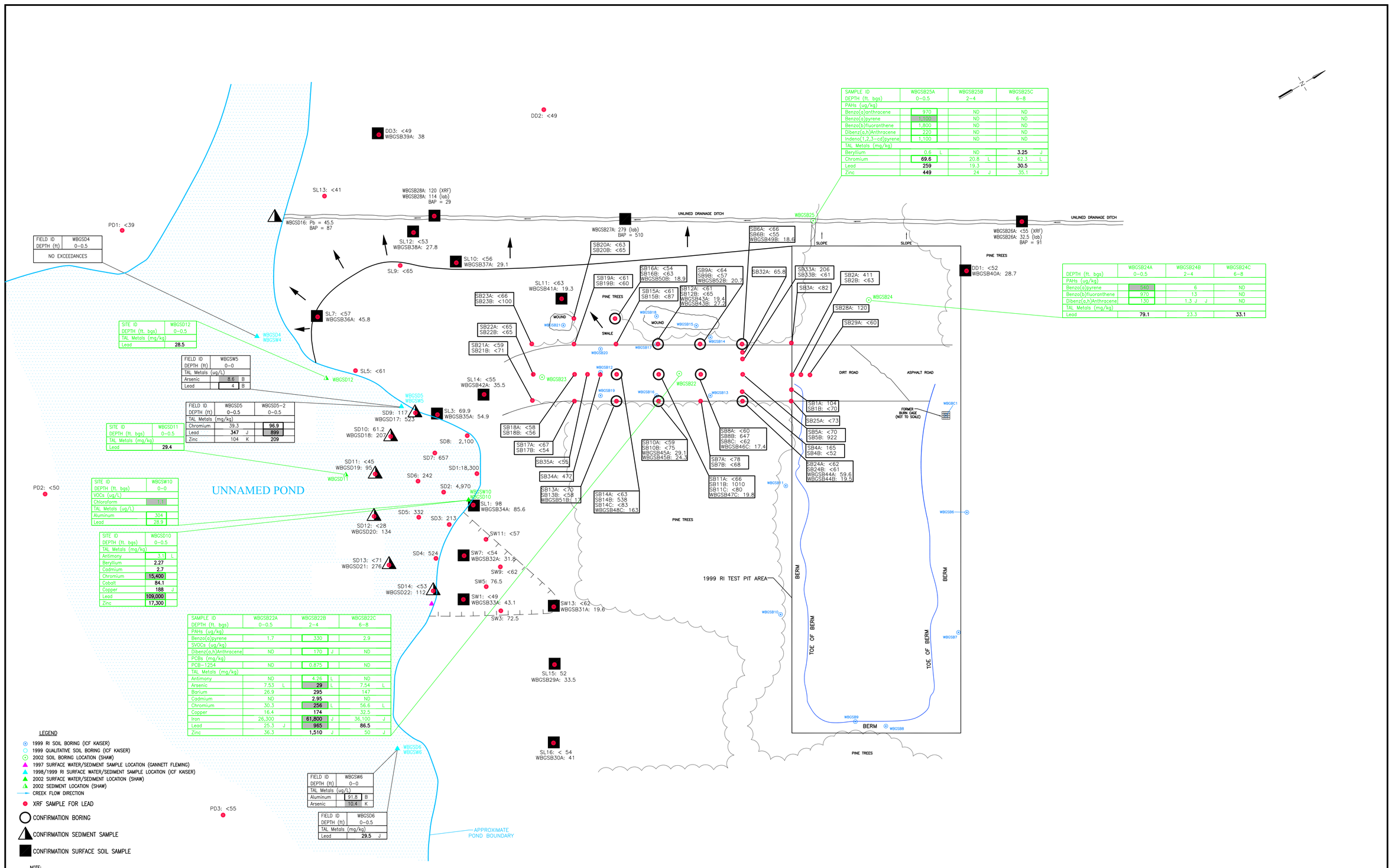
Based on the chemical results of environmental samples collected in the WBG study area, the extent of contamination can be defined by metals, specifically arsenic, iron, and lead in surface soil; arsenic and lead in subsurface soil; and chromium and lead in sediment. Because soil was removed from the main burn area during previous sampling/test pitting, the main burn area is no longer a concern. The major areas of concern are the unpaved road leading from the former burning ground to the unnamed pond and the unnamed pond itself.

Because of the elevated lead concentrations in both soil and sediment detected during the 2002 Investigation, additional investigative activities were required to fully delineate the extent of metals in the unnamed pond and along the slope and drainage swale leading from the burning ground to the pond. The 2004 Investigation was intended to fill these data gaps

6.3 2004 Additional Delineation Sampling

Similarly to the NBG, lead was detected at elevated levels along with other TAL metals, including chromium, arsenic, and zinc. Since lead is present at the highest concentrations and is present most consistently, it was used to define the extent of contamination at the site. Activities at the WBG included additional soil, sediment, and surface water sampling to:

- bound the extent of elevated lead detected in the unnamed pond downslope of the burning area;
- identify the extent of elevated lead in soil under the dirt road leading from the burn area to the unnamed pond;
- assess potential migration routes to the pond from the burning area by assessing the soil from the slope and unlined drainage swale leading to the unnamed pond;
- assess the unlined drainage ditch to the southwest of the WBG as a secondary migration pathway; and,
- confirm the detection of perchlorate in surface water from the unnamed creek where it first enters the NRU.



FIELD ID	WBGSD4
DEPTH (ft)	0–0.5
NO EXCEEDANCES	

SITE ID	WBGSD12
DEPTH (ft. bgs)	0–0.5
TAL Metals (mg/kg)	
Lead	28.5

FIELD ID	WBGSW5	
DEPTH (ft)	0–0	
TAL Metals (ug/L)		
Arsenic	8.6	B
Lead	4	B

FIELD ID	WBGSD5	WBGSD5–2
DEPTH (ft)	0–0.5	0–0.5
TAL Metals (mg/kg)		
Chromium	39.3	96.9
Lead	347 J	899
Zinc	104 K	209

SITE ID	WBGSD11
DEPTH (ft. bgs)	0–0.5
TAL Metals (mg/kg)	
Lead	29.4

SITE ID	WBGSW10
DEPTH (ft. bgs)	0–0
VOCs (ug/L)	
Chloroform	1.1 J
TAL Metals (ug/L)	
Aluminum	304
Lead	28.9

SITE ID	WBGSD10	
DEPTH (ft. bgs)	0–0.5	
TAL Metals (mg/kg)		
Antimony	3.1	L
Beryllium	2.27	
Cadmium	2.7	
Chromium	15,400	
Cobalt	84.1	
Copper	188	J
Lead	109,000	
Zinc	17,300	

SAMPLE ID	WBGSB25A	WBGSB25B	WBGSB25C
DEPTH (ft. bgs)	0–0.5	2–4	6–8
PAHs (ug/kg)			
Benzo(a)anthracene	970	ND	ND
Benzo(a)pyrene	1,100	ND	ND
Benzo(b)fluoranthene	1,800	ND	ND
Dibenz(a,h)Anthracene	220	ND	ND
Indeno(1,2,3-cd)pyrene	1,100	ND	ND
TAL Metals (mg/kg)			
Beryllium	0.6 L	ND	3.25 J
Chromium	69.6	20.8 L	62.3 L
Lead	259	19.3	30.5
Zinc	449	24 J	35.1 J

	WBGSB24A	WBGSB24B	WBGSB24C
DEPTH (ft. bgs)	0–0.5	2–4	6–8
PAHs (ug/kg)			
Benzo(a)pyrene	540	6	ND
Benzo(b)fluoranthene	970	1.3	ND
Dibenz(a,h)Anthracene	130	1.3 J J	ND
TAL Metals (mg/kg)			
Lead	79.1	23.3	33.1

SAMPLE ID	WBGSB22A	WBGSB22B	WBGSB22C
DEPTH (ft. bgs)	0–0.5	2–4	6–8
PAHs (ug/kg)			
Benzo(a)pyrene	1.7	330	2.9
SVOCs (ug/kg)			
Dibenz(a,h)Anthracene	ND	170 J	ND
PCBs (mg/kg)			
PCB-1254	ND	0.875	ND
TAL Metals (mg/kg)			
Antimony	ND	4.26 L	ND
Arsenic	7.53 L	29 L	7.54 L
Barium	26.9	295	147
Cadmium	ND	2.95	ND
Chromium	30.3	256 L	56.6 L
Copper	16.4	174	32.5
Iron	26,300	61,800 J	36,100 J
Lead	25.3 J	965	86.5
Zinc	36.3	1,510 J	50 J

FIELD ID	WBGSW6	
DEPTH (ft)	0–0	
TAL Metals (ug/L)		
Aluminum	91.8	B
Arsenic	10.4	K

FIELD ID	WBGSD6
DEPTH (ft)	0–0.5
TAL Metals (mg/kg)	
Lead	29.5 J

LEGEND

- 1999 RI SOIL BORING (ICF KAISER)
- 1999 QUALITATIVE SOIL BORING (ICF KAISER)
- 2002 SOIL BORING LOCATION (SHAW)
- 1997 SURFACE WATER/SEDIMENT SAMPLE LOCATION (GANNETT FLEMING)
- 1998/1999 RI SURFACE WATER/SEDIMENT SAMPLE LOCATION (ICF KAISER)
- 2002 SURFACE WATER/SEDIMENT LOCATION (SHAW)
- 2002 SEDIMENT LOCATION (SHAW)
- CREEK FLOW DIRECTION
- XRF SAMPLE FOR LEAD
- CONFIRMATION BORING
- CONFIRMATION SEDIMENT SAMPLE
- CONFIRMATION SURFACE SOIL SAMPLE

NOTE:

B = BLANK CONTAMINATION
J = ESTIMATED CONCENTRATION
K = ESTIMATED CONCENTRATION BIAS HIGH
L = ESTIMATED CONCENTRATION BIAS LOW
ND = NOT DETECTED
UJ = ESTIMATED NON-DETECT
DARK BORDER = VALUE EXCEEDS THE RESIDENTIAL SCREENING LEVEL (USEPA; APRIL, 2003)
SHADING = VALUE EXCEEDS THE INDUSTRIAL SCREENING LEVEL (USEPA; APRIL, 2003)
BOLD = VALUE EXCEEDS THE BACKGROUND CRITERION (IT, 2001)
VALUES DETECTED BELOW BACKGROUND ARE NOT SHOWN

0 9 18 36
SCALE IN FEET

RADFORD AAP

FIGURE 6–1

WESTERN BURNING GROUND SAMPLING

PREPARED BY: SHAW	TASK NO: 829670
CHECKED BY: MT	SHAW DWG NO: Figure 6–1.dwg
DATE: REVISED APRIL 2004	

Ecological samples were collected to identify adverse effects on organisms inhabiting the unnamed pond. Specifically, fish tissue samples were collected to assess aquatic organism health through fish bioaccumulation measurements. A summary of the sample program is presented in **Table 6-1**.

Table 6-1
2004 Investigation Sampling and Analysis
Western Burning Ground

Media	Number of Samples	Analysis	Objective
Surface Soil – XRF	55	Lead (XRF)	Define extent of lead in surface soil; identify migration pathways.
Subsurface Soil – XRF	26	Lead (XRF)	Define extent of lead in subsurface soil.
Sediment – XRF	14	Lead (XRF)	Define extent of lead in sediment.
Surface Soil	21	TAL Metals, TCL PCBs, PAHs (3 samples)	Confirm extent of lead as defined by XRF.
Subsurface Soil	10	TAL Metals, TCL PCBs	Confirm extent of lead as defined by XRF.
Sediment	10	TAL Metals, TCL PCBs, PAHs (1 sample)	Confirm extent of lead as defined by XRF.
Fish Tissue – Bioaccumulation	16	TAL Metals, TCL PCBs, Lipids	Evaluate levels of metals and PCBs in fish tissue in the unnamed pond.

6.3.1 XRF Screening

XRF field screening was completed on surface and subsurface soil and sediment. Surface soil samples for XRF screening were collected from a square grid pattern with an 18 ft spacing between grid line intersections (**Figure 6-1**). The grid is 270 ft by 270 ft and approximately half of the grid extends over the unnamed pond and was used to collect sediment samples from the pond. XRF Lead results are presented in **Table 6-2**.

Sixteen surface soil samples were collected initially from the slope leading from the WBG to the unnamed pond. These samples were collected below the end of the dirt access road and from the slope and drainage swale southeast of the road to identify potential migration pathways between the former burning area and the pond. Samples were biased towards drainage pathways, accumulation areas, or other indications of contamination. Additional XRF samples were collected from grid intersections to bound the extent of lead in this area to a concentration of 400 mg/kg (or less).

Surface and subsurface soil samples were collected from borings through the unnamed road and on each side of the road. Borings were continued down the road toward the pond until the lead concentration was below the residential screening level. The subsurface soil samples from each boring were collected from the layer of ash/soil.

Table 6-2
Western Burning Ground 2004 XRF Lead Results
Page 1 of 2

XRF Sample ID	XRF Pb Conc.	Lab Sample ID	Lab Pb Conc.
Dirt Road			
SB1A	104		
SB1B	< 70		
SB2A	411		
SB2B	< 63		
SB3A	< 82		
SB4A	165		
SB4B	< 52		
SB5A	< 70		
SB5B	922		
SB6A	< 66		
SB6B	< 55	WBGSB49B	18.6
SB7A	< 78		
SB7B	< 68		
SB8A	< 60		
SB8B	647		
SB8C	< 62	WBGSB46C	17.4
SB9A	< 64		
SB9B	< 57	WBGSB52B	20.7
SB10A	< 59	WBGSB45A	29.1
SB10B	< 75	WBGSB45B	24.3
SB11A	< 66		
SB11B	1010		
SB11C	< 80	WBGSB47C	19.8
SB12A	< 61	WBGSB43A	19.4
SB12B	< 65	WBGSB43B	27.2
SB13A	< 70		
SB13B	< 58	WBGSB51B	17
SB14A	< 63		
SB14B	538		
SB14C	< 83	WBGSB48C	163
SB15A	< 61		
SB15B	< 87		
SB16A	< 54		
SB16B	< 63	WBGSB50B	18.9
SB17A	< 67		
SB17B	< 54		
SB18A	< 58		
SB18B	< 56		
SB19A	< 61		
SB19B	< 60		
SB20A	< 63		
SB20B	< 65		
SB21A	< 59		
SB21B	< 71		
SB22A	< 65		
SB22B	< 65		
SB23A	< 66		
SB23B	< 100		
SB24A	< 62	WBGSB44A	59.6
SB24B	< 61	WBGSB44B	19.5
SB25A	< 73		
SB28A	120		
SB29A	< 60		
SB32A	65.8		

Table 6-2
Western Burning Ground 2004 XRF Lead Results

XRF Sample ID	XRF Pb Conc.	Lab Sample ID	Lab Pb Conc.
SB33A	206		
SB33B	< 61		
SB34A	477		
SB35A	< 55		
Unlined Drainage Ditch			
WBGSB26A	< 55	WBGSB26A	32.5
--	--	WBGSB27A	279
WBGSB28A	120	WBGSB28A	114
DD1	< 52	WBGSB40A	28.7
DD2	< 49		
DD3	< 49	WBGSB39A	38
Slope			
SL1	98	WBGSB34A	85.6
SL3	69.9	WBGSB35A	54.9
SL5	< 61		
SL7	< 57	WBGSB36A	45.8
SL9	< 65		
SL10	< 56	WBGSB37A	29.1
SL11	< 63	WBGSB41A	19.3
SL12	< 53	WBGSB38A	27.8
SL13	< 41		
SL14	< 55	WBGSB42A	35.5
SL15	52	WBGSB29A	33.5
SL16	< 54	WBGSB30A	41
Swale			
SW1	< 49	WBGSB33A	43.1
SW3	72.5		
SW5	76.5		
SW7	< 54	WBGSB32A	31.8
SW9	< 62		
SW11	< 57		
SW13	< 62	WBGSB31A	19.6
Sediment			
SD1	18300		
SD2	4970		
SD3	213		
SD4	524		
SD5	332		
SD6	242		
SD7	657		
SD8	2100		
SD9	117	WBGSD17	523
SD10	61.2	WBGSD18	207
SD11	< 28	WBGSD19	95
SD12	< 71	WBGSD20	134
SD13	< 53	WBGSD21	276
SD14	< 48	WBGSD22	112
--	--	WBGSD16	45.5
Pond Perimeter			
PD1	< 39		
PD2	< 50		
PD3	< 55		

found beneath the roadbed material. If the ash/soil was not encountered in a boring, the sample depth was based on the closest boring where the ash/soil layer was identified. Confirmation samples were collected at locations where the lead concentrations were less than 400 mg/kg.

Fourteen sediment samples were collected for XRF screening. These samples were collected from the same grid as the soil samples where it extends over the pond. Initially, ten samples were collected near 2002 Investigation sample WBGSD10 and were designed to assess the extent of lead-impacted sediment in the pond. Four additional XRF sediment samples were collected based on the results of the initial samples to delineate the lead-containing sediment.

6.3.2 Confirmation Sampling

Confirmation samples were collected from surface and subsurface soil and sediment after the extent of lead at concentrations greater than 400 mg/kg was established through the XRF field screening. The confirmation samples were analyzed for TAL metals. A sufficient number of samples were collected to ensure that the extent of elevated concentrations of lead was delineated with validated analytical data from a laboratory. Locations of these samples are presented on **Figure 6-2**.

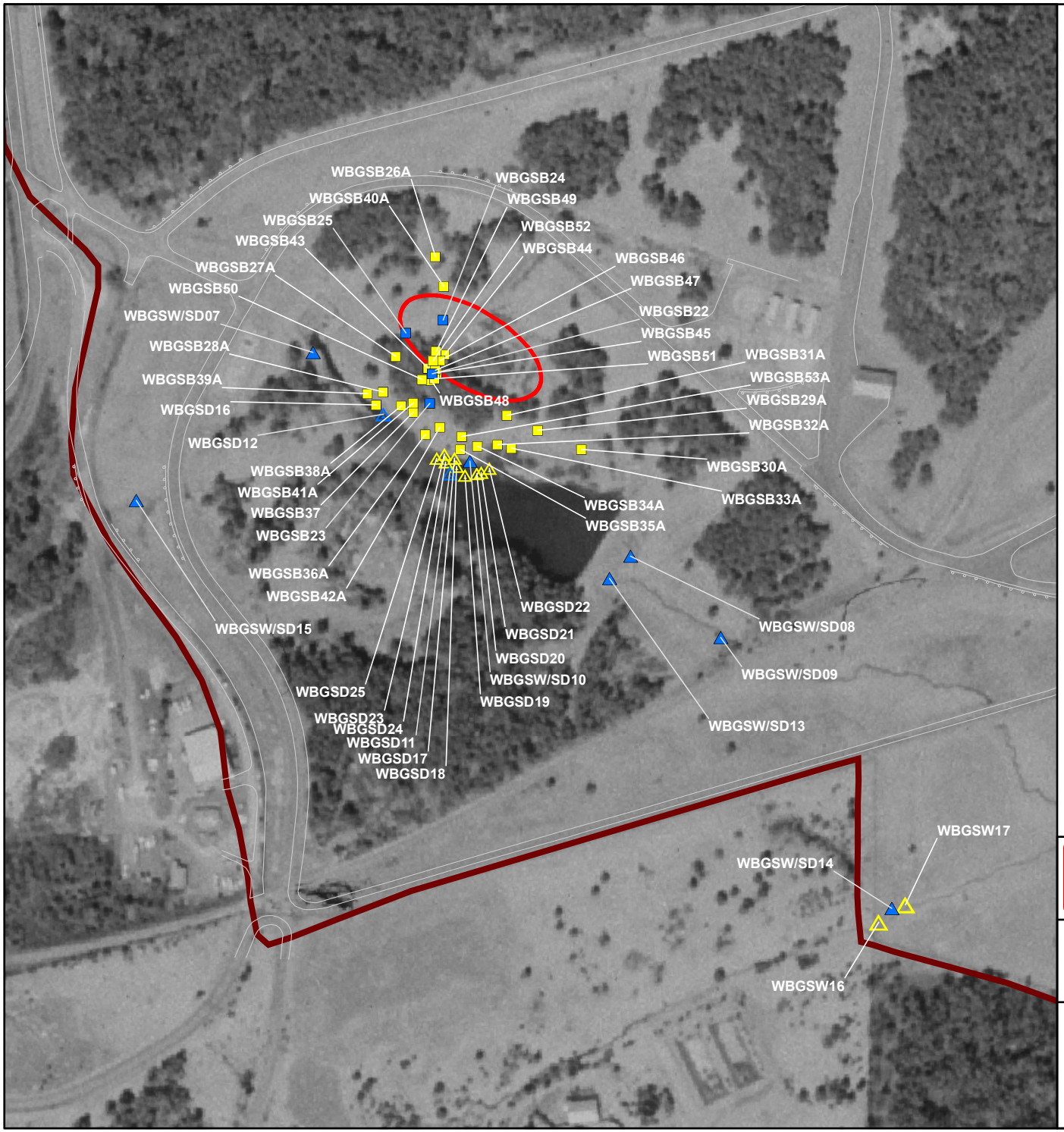
Three additional surface soil samples were collected from the unlined drainage ditch to the north of the site (Figure 6-1). One sample (WBGSB26A) was collected upgradient of sample WBGSB25 and the WBG. The other two soil samples (WBGSB27A & WBGSB28A) were collected between sample WBGSB25 and the unnamed pond. A sediment sample (WBGSD16) was collected from the unnamed pond at the confluence of the ditch and the pond. These samples were analyzed for TAL metals, TCL PCBs, and PAHs (sediment). Sample locations are shown on **Figures 6-1 and 6-2,** and the results are presented in **Tables 6-3** (soil) and **6-4** (sediment).

6.3.3 Fish Tissue/Bioaccumulation Study

Electrofishing activities occurred on July 21, 2004 in the WBG Unnamed Pond. Fish species that were captured included: bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), common carp (*Cyprinus carpio*), and white sucker (*Catostomus commersoni*). Bluegill were the most abundant fish in the pond and were selected to represent water column dwelling fish in the pond. Only one common carp and one white sucker were collected and were used to represent bottom dwelling fish in the pond.

Seven bluegill ranging from 168 to 186 mm in length and 90 to 143 grams in weight were selected for whole body analysis, while seven bluegill ranging from 190 to 222 mm in length and 140 to 233 grams in weight were selected for fillet analysis. Due to the fact that only two bottom dwelling fish were collected, the single white sucker (410 mm in length and weighed 1 lb 15 oz) was selected for whole body analysis and the single common carp (670 mm in length and 10 lbs 8 oz) was selected for fillet analysis.

All fish tissue samples were sent to GPL Laboratories and analyzed for TCL PCBs, TAL metals, and percent lipids. Detected constituent are presented in **Table 6-5**. Field Notes, Data Collection Sheets and Analytical Data are presented in **Appendix E**.



LEGEND

2002 Sample Location

- Sediment
- Sediment/Surface Water
- Soil

2004 Sample Location

- Sediment
- Sediment/Surface Water
- Soil

- Road
- Western Burning Ground Boundary
- NRU Installation Boundary

Note:
1) Aerial photo, dated 25 May 2000, was obtained from the Army Topographic Engineering Center.

N

Scale:

0 150 300 600 Feet

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 6-2
2002 and 2004 Sample Locations at the Western Burning Ground
Radford Army Ammunition Plant
Radford, VA

ArcGIS File: RFAAP_Fig6-2_NRU_WBG_04_Sample_Locations.mxd (9/4/2007 5:30:28 PM)

Table 6-3
Western Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			WBGSB26A					WBGSB27A					WBGSB28A					WBGSB29A					WBGSB30A					WBGSB31A					WBGSB32A					WBGSB33A				
	Sample Date			7/16/04					7/16/04					7/16/04					7/19/04					7/19/04					7/19/04					7/19/04					7/19/04				
	Sample Depth			0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																											
Anthracene	31000000	2300000	na	15			*9.1*	*9.1*	52			*9.4*	*9.4*	8.5	U		*8.5*	*8.5*	NT					NT					NT					NT					NT				
Benz(a)anthracene	3900	220	na	89			*9.1*	*9.1*	420			*9.4*	*9.4*	21		J	*8.5*	*8.5*	NT					NT					NT					NT					NT				
Benzo(a)pyrene	390	22	na	91			*9.1*	*9.1*	510			*94*	*94*	29		J	*8.5*	*8.5*	NT					NT					NT					NT					NT				
Benzo(b)fluoranthene	3900	220	na	170			*9.1*	*9.1*	640			*94*	*94*	46		J	*8.5*	*8.5*	NT					NT					NT					NT					NT				
Benzo(g,h,i)perylene	3100000	230000	na	74			*9.1*	*9.1*	270			*9.4*	*9.4*	27			*8.5*	*8.5*	NT					NT					NT					NT					NT				
Benzo(k)fluoranthene	39000	2200	na	44			*9.1*	*9.1*	170			*9.4*	*9.4*	17			*8.5*	*8.5*	NT					NT					NT					NT					NT				
Chrysene	390000	22000	na	110			*9.1*	*9.1*	330			*9.4*	*9.4*	26			*8.5*	*8.5*	NT					NT					NT					NT					NT				
Dibenz(a,h)anthracene	390	22	na	9.1	U		*9.1*	*9.1*	80			*9.4*	*9.4*	8.5	U		*8.5*	*8.5*	NT					NT					NT					NT					NT				
Fluoranthene	4100000	310000	na	230			*9.1*	*9.1*	610			*94*	*94*	48			*8.5*	*8.5*	NT					NT					NT					NT					NT				
Indeno(1,2,3-cd)pyrene	3900	220	na	69			*9.1*	*9.1*	270			*9.4*	*9.4*	25			*8.5*	*8.5*	NT					NT					NT					NT					NT				
Phenanthrene	3100000	230000	na	87			*9.1*	*9.1*	200			*9.4*	*9.4*	16			*8.5*	*8.5*	NT					NT					NT					NT					NT				
Pyrene	3100000	230000	na	140		J	*9.1*	*9.1*	390			*9.4*	*9.4*	28		J	*8.5*	*8.5*	NT					NT					NT					NT					NT				
PCBs (mg/kg)																																											
Metals (mg/kg)																																											
Aluminum	100000	7800	40041	15700			*1.4*	*21.8*	19000			*1.4*	*22.3*	21800			*1.2*	*19.4*	40000			*1.2*	*18.8*	34300			*1.4*	*21.7*	24200			*1.2*	*18.2*	28500			*1.3*	*20.6*	20100			*1.5*	*23.2*
Antimony	41	3.1	na	0.36	UN	UL	*0.36*	*2.2*	1.6	BN	B	*0.37*	*2.2*	0.61	BN	B	*0.32*	*1.9*	0.83	BN	B	*0.31*	*1.9*	0.61	BN	B	*0.36*	*2.2*	0.85	BN	B	*0.3*	*1.8*	0.47	BN	B	*0.34*	*2.1*	0.76	BN	B	*0.38*	*2.3*
Arsenic	1.9	0.43	15.8	8.3			*0.41*	*2.2*	9.5			*0.42*	*2.2*	9.4			*0.37*	*1.9*	10.8			*0.36*	*1.9*	13.3			*0.41*	*2.2*	9.4			*0.35*	*1.8*	9.8			*0.39*	*2.1*	7.9			*0.44*	*2.3*
Barium	20000	1600	209	45.5			*0.017*	*0.54*	128			*0.018*	*0.56*	81.7			*0.016*	*0.49*	72.9	N		*0.015*	*0.47*	55.8	N		*0.017*	*0.54*	34.1	N		*0.015*	*0.46*	74.1	N		*0.016*	*0.52*	53.8	N		*0.019*	*0.58*
Beryllium	200	16	1.02	0.83	E	J	*0.014*	*0.22*	0.92	E	J	*0.014*	*0.22*	**1.3**	**E**	**J**	*0.013*	*0.19*	**2.8**			*0.012*	*0.19*	**2.9**			*0.014*	*0.22*	0.63			*0.012*	*0.18*	**1.4**			*0.013*	*0.21*	**1.3**			*0.015*	*0.23*
Cadmium	51	3.9	0.69	0.038	U		*0.038*	*0.65*	0.38	B	J	*0.039*	*0.67*	0.084	B	J	*0.034*	*0.58*	0.42	B	J	*0.033*	*0.56*	0.37	B	J	*0.038*	*0.65*	0.2	B	J	*0.032*	*0.55*	0.4	B	J	*0.036*	*0.62*	0.3	B	J	*0.041*	*0.7*
Calcium	na	na	na	1650			*8.4*	*109*	8840			*8.6*	*112*	3980			*7.5*	*97*	5740	*	J	*7.2*	*94.1*	4330	*	J	*8.3*	*109*	1230	*	J	*7*	*91.1*	4030	*	J	*7.9*	*103*	5320	*	J	*8.9*	*116*
Chromium	310	23	65.3	26.7			*0.05*	*0.54*	44.8			*0.051*	*0.56*	45.2			*0.045*	*0.49*	59.5			*0.043*	*0.47*	54.8			*0.05*	*0.54*	35.6			*0.042*	*0.46*	43.4			*0.047*	*0.52*	32.7			*0.053*	*0.58*
Cobalt	na	na	72.3	14.5			*0.095*	*0.54*	10.2			*0.097*	*0.56*	9.8			*0.084*	*0.49*	21.1			*0.082*	*0.47*	30.6			*0.095*	*0.54*	10.8			*0.079*	*0.46*	13.6			*0.09*	*0.52*	11.1			*0.1*	*0.58*
Copper	4100	310	53.5	15.6			*0.096*	*1.1*	47.1			*0.098*	*1.1*	28.6			*0.085*	*0.97*	31.2			*0.083*	*0.94*	28.3			*0.096*	*1.1*	17.5			*0.08*	*0.91*	21			*0.091*	*1*	20.5			*0.1*	*1.2*
Iron	72000	5500	50962	24900			*3.5*	*16.3*	24600			*3.6*	*16.7*	28300			*3.1*	*14.6*	37800	*		*3*	*14.1*	37000	*		*3.5*	*16.3*	30900	*		*3*	*13.7*	31100	*		*3.3*	*15.5*	21600	*		*3.8*	*17.4*
Lead	800	400	26.8	**32.5**			*0.14*	*1.1*	**279**			*0.14*	*1.1*	**114**			*0.13*	*0.97*	**33.5**			*0.12*	*0.94*	**41**			*0.14*	*1.1*	19.6			*0.12*	*0.91*	**31.8**			*0.13*	*1*	**43.1**			*0.15*	*1.2*
Magnesium	na	na	na	1220	N	K	*1*	*27.2*	3390	N		*1*	*27.9*	3140	N		*0.9*	*24.3*	9210	N		*0.87*	*23.5*	4710	N		*1*	*27.2*	752	N		*0.85*	*22.8*	6230	N		*0.96*	*25.8*	3010	N		*1.1*	*29*
Manganese	2000	160	2543	637			*0.017*	*0.54*	428			*0.018*	*0.56*	251			*0.016*	*0.49*	280	N		*0.015*	*0.47*	283	N		*0.017*	*0.54*	180	N		*0.015*	*0.46*	364	N		*0.016*	*0.52*	224	N		*0.019*	*0.58*
Mercury	31	2.3	0.13	0.061			*0.021*	*0.043*	0.07			*0.022*	*0.043*	0.067			*0.018*	*0.036*	0.12			*0.017*	*0.035*	**0.13**			*0.018*	*0.035*	0.08			*0.015*	*0.029*	0.097			*0.018*	*0.035*	0.085			*0.02*	*0.04*
Nickel	2000	160	62.8	14.9			*0.066*	*1.1*	17.3			*0.068*	*1.1*	20.7			*0.059*	*0.97*	35.2			*0.057*	*0.94*	33.6			*0.066*	*1.1*	12.1			*0.056*	*0.91*	22.6			*0.063*	*1*	16.6			*0.071*	*1.2*
Potassium	na	na	na	702			*3.2*	*27.2*	1120			*3.3*	*27.9*	1200			*2.9*	*24.3*	2910	N		*2.8*	*23.5*	2050	N		*3.2*	*27.2*	792	N		*2.7*	*22.8*	1620	N		*3.1*	*25.8*	1200	N		*3.5*	*29*
Selenium	510	39	na	1.1	B	B	*0.7*	*2.2*	0.75	B	B	*0.71*	*2.2*	0.86	B	B	*0.62*	*1.9*	0.83	B	B	*0.6*	*1.9*	1	B	B	*0.7*	*2.2*	0.74	B	B	*0.58*	*1.8*	0.66	U		*0.66*	*2.1*	0.74	U		*0.74*	*2.3*
Sodium	na	na	na	62.1	B	B	*35.4*	*272*	136	B	B	*36.2*	*279*	84.5	B	B	*31.5*	*243*	72	B	B	*30.6*	*235*	72.5	B	B	*35.3*	*272*	75.8	B	B	*29.6*	*228*	80.7	B	B	*33.5*	*258*	101	B	B	*37.7*	*290*
Vanadium	102	7.8	108	46.1			*0.089*	*1.1*	48			*0.091*	*1.1*	53.9			*0.08*	*0.97*	80.9			*0.077*	*0.94*	74.2			*0.089*	*1.1*	63.5			*0.075*	*0.91*	63			*0.084*	*1*	46.1			*0.095*	*1.2*
Zinc	31000	2300	202	43.6			*0.62*	*2.2*	**459**			*0.64*	*2.2*	**202**			*0.55*	*1.9*	55.9			*0.54*	*1.9*	51.6			*0.62*	*2.2*	28.7			*0.52*	*1.8*	51.9			*0.59*	*2.1*	56.3			*0.66*	*2.3*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 **J**	Bold, underlined font indicates a Background exceedance.
12 *12*	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 6-3
Western Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			WBGSB34A					WBGSB35A					WBGSB36A					WBGSB37A					WBGSB38A					WBGSB39A					WBGSB40A					WBGSB41A				
	Sample Date			7/19/04					7/20/04					7/20/04					7/20/04					7/19/04					7/19/04					7/19/04					7/19/04				
	Sample Depth			0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																											
Anthracene	31000000	2300000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benz(a)anthracene	3900	220	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(a)pyrene	390	22	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(b)fluoranthene	3900	220	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(g,h,i)perylene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(k)fluoranthene	39000	2200	na	NT					NT					NT					NT					NT					NT					NT					NT				
Chrysene	390000	22000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Dibenz(a,h)anthracene	390	22	na	NT					NT					NT					NT					NT					NT					NT					NT				
Fluoranthene	4100000	310000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Indeno(1,2,3-cd)pyrene	3900	220	na	NT					NT					NT					NT					NT					NT					NT					NT				
Phenanthrene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Pyrene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT					NT				
PCBs (mg/kg)																																											
Metals (mg/kg)																																											
Aluminum	100000	7800	40041	30400			*1.2*	*18.2*	33700			*1.2*	*18.2*	39000			*1.4*	*21.7*	26300			*1.1*	*17.8*	24400			*1.2*	*18.4*	16500			*1.3*	*19.9*	15700			*1.2*	*18.6*	27000			*1.1*	*16.5*
Antimony	41	3.1	na	0.52	BN	B	*0.3*	*1.8*	0.3	UN		*0.3*	*1.8*	0.8	BN	B	*0.36*	*2.2*	0.53	BN	J	*0.29*	*1.8*	0.42	BN	J	*0.3*	*1.8*	0.33	UN		*0.33*	*2*	0.49	BN	J	*0.31*	*1.9*	0.36	BN	J	*0.27*	*1.6*
Arsenic	1.9	0.43	15.8	10.8			*0.35*	*1.8*	8.6			*0.35*	*1.8*	**15.8**			*0.41*	*2.2*	10.2			*0.34*	*1.8*	9			*0.35*	*1.8*	6.1			*0.38*	*2*	5.6			*0.35*	*1.9*	7.2			*0.31*	*1.6*
Barium	20000	1600	209	54.9	N		*0.015*	*0.45*	83.5			*0.015*	*0.46*	56.4	N		*0.017*	*0.54*	34.4			*0.014*	*0.44*	43.5			*0.015*	*0.46*	72.5			*0.016*	*0.5*	39.2			*0.015*	*0.47*	51.6			*0.013*	*0.41*
Beryllium	200	16	1.02	**1.6**			*0.012*	*0.18*	**2.3**			*0.012*	*0.18*	**3.1**			*0.014*	*0.22*	**1.4**			*0.012*	*0.18*	**1.1**			*0.012*	*0.18*	0.87			*0.013*	*0.2*	0.74			*0.012*	*0.19*	**1.6**			*0.011*	*0.16*
Cadmium	51	3.9	0.69	0.39	B	J	*0.032*	*0.55*	0.082	B	B	*0.032*	*0.55*	0.59	B	J	*0.038*	*0.65*	0.031	U		*0.031*	*0.53*	0.032	U		*0.032*	*0.55*	0.078	B	B	*0.035*	*0.6*	0.033	U		*0.033*	*0.56*	0.029	U		*0.029*	*0.49*
Calcium	na	na	na	3390	*	J	*7*	*90.9*	7550			*7*	*91.2*	7950	*	J	*8.3*	*108*	3130			*6.8*	*88.8*	2920			*7.1*	*91.8*	2400			*7.6*	*99.5*	1150			*7.1*	*93.1*	1600			*6.3*	*82.4*
Chromium	310	23	65.3	49.6			*0.042*	*0.45*	51.8	N*	J	*0.042*	*0.46*	58.5			*0.05*	*0.54*	39.7	N*	J	*0.041*	*0.44*	37.4	N*	J	*0.042*	*0.46*	24.2	N*	J	*0.046*	*0.5*	25	N*	J	*0.043*	*0.47*	46.8	N*	J	*0.038*	*0.41*
Cobalt	na	na	72.3	16.5			*0.079*	*0.45*	16.6			*0.079*	*0.46*	30.6			*0.094*	*0.54*	17.4			*0.077*	*0.44*	13.6			*0.08*	*0.46*	7.5			*0.087*	*0.5*	16			*0.081*	*0.47*	13.3			*0.072*	*0.41*
Copper	4100	310	53.5	22.6			*0.08*	*0.91*	24			*0.08*	*0.91*	31.4			*0.095*	*1.1*	25.2			*0.078*	*0.89*	19.3			*0.081*	*0.92*	16.2			*0.088*	*1*	11.7			*0.082*	*0.93*	19.3			*0.073*	*0.82*
Iron	72000	5500	50962	33300	*		*2.9*	*13.6*	30000			*3*	*13.7*	41400	*		*3.5*	*16.3*	32000			*2.9*	*13.3*	29200			*3*	*13.8*	17600			*3.2*	*14.9*	18300			*3*	*14*	32400			*2.7*	*12.4*
Lead	800	400	26.8	**85.6**			*0.12*	*0.91*	**54.9**			*0.12*	*0.91*	**45.8**			*0.14*	*1.1*	**29.1**			*0.12*	*0.89*	**27.8**			*0.12*	*0.92*	**38**			*0.13*	*1*	**28.7**			*0.12*	*0.93*	19.3			*0.11*	*0.82*
Magnesium	na	na	na	4230	N		*0.85*	*22.7*	12200			*0.85*	*22.8*	6750	N		*1*	*27.1*	2750			*0.83*	*22.2*	2800			*0.85*	*23*	1530			*0.93*	*24.9*	1780			*0.87*	*23.3*	4850			*0.77*	*20.6*
Manganese	2000	160	2543	212	N		*0.015*	*0.45*	233			*0.015*	*0.46*	282	N		*0.017*	*0.54*	154			*0.014*	*0.44*	166			*0.015*	*0.46*	292			*0.016*	*0.5*	449			*0.015*	*0.47*	193			*0.013*	*0.41*
Mercury	31	2.3	0.13	0.092			*0.016*	*0.032*	0.11			*0.018*	*0.036*	**0.13**			*0.018*	*0.036*	0.1			*0.018*	*0.036*	0.076		B	*0.015*	*0.029*	0.036		B	*0.017*	*0.034*	0.041		B	*0.017*	*0.034*	0.053		B	*0.017*	*0.033*
Nickel	2000	160	62.8	24.3			*0.055*	*0.91*	29.6			*0.056*	*0.91*	36.8			*0.066*	*1.1*	21.1			*0.054*	*0.89*	19.2			*0.056*	*0.92*	12.3			*0.061*	*1*	12.9			*0.057*	*0.93*	24.1			*0.05*	*0.82*
Potassium	na	na	na	1690	N		*2.7*	*22.7*	2530	N		*2.7*	*22.8*	2820	N		*3.2*	*27.1*	1600	N		*2.6*	*22.2*	1470	N		*2.7*	*23*	612	N		*3*	*24.9*	764	N		*2.8*	*23.3*	1270	N		*2.5*	*20.6*
Selenium	510	39	na	0.73	B	B	*0.58*	*1.8*	0.58	U		*0.58*	*1.8*	0.85	B	B	*0.69*	*2.2*	0.78	B	B	*0.57*	*1.8*	0.59	U		*0.59*	*1.8*	0.64	U		*0.64*	*2*	0.6	U		*0.6*	*1.9*	0.74	B	B	*0.53*	*1.6*
Sodium	na	na	na	70.6	B	B	*29.5*	*227*	51.2	B	J	*29.6*	*228*	82.7	B	B	*35.2*	*271*	54.2	B	J	*28.8*	*222*	46	B	B	*29.8*	*230*	58.4	B	B	*32.3*	*249*	75.8	B	B	*30.2*	*233*	43	B	B	*26.8*	*206*
Vanadium	102	7.8	108	66.5			*0.075*	*0.91*	62.1			*0.075*	*0.91*	84.7			*0.089*	*1.1*	63.4			*0.073*	*0.89*	58.4			*0.075*	*0.92*	37.5			*0.082*	*1*	43			*0.076*	*0.93*	65.6			*0.068*	*0.82*
Zinc	31000	2300	202	48.7			*0.52*	*1.8*	45.5			*0.52*	*1.8*	52			*0.62*	*2.2*	41			*0.51*	*1.8*	37.2			*0.52*	*1.8*	67.5			*0.57*	*2*	34.1			*0.53*	*1.9*	32.1			*0.47*	*1.6*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 **J**	Bold, underlined font indicates a Background exceedance.
12 *12*	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 6-3
Western Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			WBGSB42A					WBGSB43A					WBGSB43B					WBGSB44A					WBGSB44B					WBGSB45A					WBGSB45B					WBGSB46C				
	Sample Date			7/19/04					7/19/04					7/19/04					7/19/04					7/19/04					7/19/04					7/19/04					7/19/04				
	Sample Depth			0-0.5					0-0.5					4-5					0-0.5					1-2					0-0.5					4-5					4-5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																											
Anthracene	31000000	2300000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benz(a)anthracene	3900	220	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(a)pyrene	390	22	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(b)fluoranthene	3900	220	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(g,h,i)perylene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Benzo(k)fluoranthene	39000	2200	na	NT					NT					NT					NT					NT					NT					NT					NT				
Chrysene	390000	22000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Dibenz(a,h)anthracene	390	22	na	NT					NT					NT					NT					NT					NT					NT					NT				
Fluoranthene	4100000	310000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Indeno(1,2,3-cd)pyrene	3900	220	na	NT					NT					NT					NT					NT					NT					NT					NT				
Phenanthrene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT					NT				
Pyrene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT					NT				
PCBs (mg/kg)																																											
Metals (mg/kg)																																											
Aluminum	100000	7800	40041	29800			*1.2*	*19.2*	17500			*1.1*	*17.4*	31700			*1.3*	*20.9*	23600			*1.2*	*18.6*	13200			*1*	*16.4*	19600			*1.1*	*18*	31900			*1.3*	*19.8*	31000			*1.3*	*20.8*
Antimony	41	3.1	na	0.32	UN		*0.32*	*1.9*	0.53	BN	L	*0.29*	*1.7*	0.34	UN		*0.34*	*2.1*	0.32	BN	J	*0.31*	*1.9*	0.33	BN	B	*0.27*	*1.6*	0.56	BN	J	*0.3*	*1.8*	0.6	BN	B	*0.33*	*2*	0.34	UN		*0.34*	*2.1*
Arsenic	1.9	0.43	15.8	12.9			*0.36*	*1.9*	4.5			*0.33*	*1.7*	12.6			*0.4*	*2.1*	9.8			*0.35*	*1.9*	5.3			*0.31*	*1.6*	8.7			*0.34*	*1.8*	12.7			*0.38*	*2*	5.9			*0.39*	*2.1*
Barium	20000	1600	209	43			*0.015*	*0.48*	90			*0.014*	*0.43*	20.6			*0.017*	*0.52*	31			*0.015*	*0.46*	35.1			*0.013*	*0.41*	33.6			*0.014*	*0.45*	39.6			*0.016*	*0.49*	58.6			*0.017*	*0.52*
Beryllium	200	16	1.02	**1.9**			*0.012*	*0.19*	**1.3**			*0.011*	*0.17*	**1.1**			*0.014*	*0.21*	0.89			*0.012*	*0.19*	0.55			*0.011*	*0.16*	0.81			*0.012*	*0.18*	**1.4**			*0.013*	*0.2*	**2.7**			*0.014*	*0.21*
Cadmium	51	3.9	0.69	0.034	U		*0.034*	*0.57*	0.066	B	B	*0.03*	*0.52*	0.037	U		*0.037*	*0.63*	0.033	U		*0.033*	*0.56*	0.029	U		*0.029*	*0.49*	0.031	U		*0.031*	*0.54*	0.035	U		*0.035*	*0.59*	0.036	U		*0.036*	*0.62*
Calcium	na	na	na	3840			*7.4*	*95.8*	3860			*6.7*	*86.9*	1060			*8*	*104*	1220			*7.1*	*92.9*	1460			*6.3*	*81.8*	1020			*6.9*	*89.8*	1310			*7.6*	*99*	1800			*8*	*104*
Chromium	310	23	65.3	46.1	N*	J	*0.044*	*0.48*	**102**	**N***	**J**	*0.04*	*0.43*	49.4	N*	J	*0.048*	*0.52*	43.9	N*	J	*0.043*	*0.46*	21.5	N*	J	*0.038*	*0.41*	33.2	N*	J	*0.041*	*0.45*	44.8	N*	J	*0.046*	*0.49*	**75.3**	**N***	**J**	*0.048*	*0.52*
Cobalt	na	na	72.3	25			*0.083*	*0.48*	11			*0.076*	*0.43*	20.2			*0.091*	*0.52*	13.4			*0.081*	*0.46*	7.2			*0.071*	*0.41*	11.5			*0.078*	*0.45*	16.5			*0.086*	*0.49*	23.2			*0.09*	*0.52*
Copper	4100	310	53.5	24.6			*0.084*	*0.96*	12.9			*0.077*	*0.87*	25.8			*0.092*	*1*	23.1			*0.082*	*0.93*	9.5			*0.072*	*0.82*	16.6			*0.079*	*0.9*	24.6			*0.087*	*0.99*	40.9			*0.091*	*1*
Iron	72000	5500	50962	37100			*3.1*	*14.4*	19300			*2.8*	*13*	47400			*3.4*	*15.7*	40600			*3*	*13.9*	19500			*2.7*	*12.3*	28200			*2.9*	*13.5*	44800			*3.2*	*14.8*	**52100**			*3.4*	*15.6*
Lead	800	400	26.8	**35.5**			*0.12*	*0.96*	19.4			*0.11*	*0.87*	**27.2**			*0.14*	*1*	**59.6**			*0.12*	*0.93*	19.5			*0.11*	*0.82*	**29.1**			*0.12*	*0.9*	24.3			*0.13*	*0.99*	17.4			*0.14*	*1*
Magnesium	na	na	na	3490			*0.89*	*23.9*	5340			*0.81*	*21.7*	1190			*0.97*	*26.1*	1260			*0.86*	*23.2*	583			*0.76*	*20.5*	865			*0.83*	*22.4*	1350			*0.92*	*24.7*	3270			*0.97*	*26*
Manganese	2000	160	2543	238			*0.015*	*0.48*	416			*0.014*	*0.43*	146			*0.017*	*0.52*	158			*0.015*	*0.46*	171			*0.013*	*0.41*	184			*0.014*	*0.45*	203			*0.016*	*0.49*	489			*0.017*	*0.52*
Mercury	31	2.3	0.13	0.11		B	*0.018*	*0.035*	0.032	B	B	*0.017*	*0.034*	0.11		B	*0.017*	*0.034*	0.064		B	*0.016*	*0.033*	0.041		B	*0.015*	*0.03*	0.059		B	*0.016*	*0.032*	0.086		B	*0.015*	*0.03*	0.05		B	*0.016*	*0.032*
Nickel	2000	160	62.8	27.1			*0.058*	*0.96*	20.4			*0.053*	*0.87*	22.7			*0.064*	*1*	16.4			*0.057*	*0.93*	8			*0.05*	*0.82*	13.3			*0.055*	*0.9*	26.8			*0.06*	*0.99*	38.2			*0.063*	*1*
Potassium	na	na	na	1600	N		*2.9*	*23.9*	929	N	K	*2.6*	*21.7*	1060	N		*3.1*	*26.1*	1030	N		*2.8*	*23.2*	602	N		*2.4*	*20.5*	745	N		*2.7*	*22.4*	1160	N		*2.9*	*24.7*	1020	N		*3.1*	*26*
Selenium	510	39	na	0.61	U		*0.61*	*1.9*	0.56	U		*0.56*	*1.7*	1.4	B	J	*0.67*	*2.1*	0.59	U		*0.59*	*1.9*	0.52	U		*0.52*	*1.6*	0.74	B	B	*0.57*	*1.8*	1.1	B	J	*0.63*	*2*	0.67	U		*0.67*	*2.1*
Sodium	na	na	na	47.9	B	B	*31.1*	*239*	58.1	B	B	*28.3*	*217*	48.6	B	B	*33.9*	*261*	58.9	B	B	*30.2*	*232*	55.6	B	B	*26.6*	*205*	57.2	B	B	*29.2*	*224*	51.4	B	B	*32.2*	*247*	33.8	U		*33.8*	*260*
Vanadium	102	7.8	108	73.1			*0.079*	*0.96*	46.9			*0.071*	*0.87*	88.5			*0.086*	*1*	67.5			*0.076*	*0.93*	38.7			*0.067*	*0.82*	56.5			*0.074*	*0.9*	83.4			*0.081*	*0.99*	96			*0.085*	*1*
Zinc	31000	2300	202	41.8			*0.55*	*1.9*	41.9			*0.5*	*1.7*	43.8			*0.59*	*2.1*	68.6			*0.53*	*1.9*	61.6			*0.47*	*1.6*	42.7			*0.51*	*1.8*	38.2			*0.56*	*2*	32			*0.59*	*2.1*

12	J	Shading and black font indicates a i-RBC exceedance.
12	J	Bold outline indicates a r-RBC exceedance.
12	**J**	Bold, underlined font indicates a Background exceedance.
12	*12*	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 6-3
Western Burning Ground
2004 Soil Sample Results

Analyte	Sample ID			WBGSB47C					WBGSB48C					WBGSB49B					WBGSB50B					WBGSB51B					WBGSB52B					WBGSB53A				
	Sample Date			7/19/04					7/19/04					7/19/04					7/19/04					7/19/04					7/19/04					9/14/04				
	Sample Depth			5-6					4-5					1-2					3-4					3-4					3-4					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																																						
Anthracene	31000000	2300000	na	NT					NT					NT					NT					NT					NT					NT				
Benz(a)anthracene	3900	220	na	NT					NT					NT					NT					NT					NT					NT				
Benzo(a)pyrene	390	22	na	NT					NT					NT					NT					NT					NT					NT				
Benzo(b)fluoranthene	3900	220	na	NT					NT					NT					NT					NT					NT					NT				
Benzo(g,h,i)perylene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT				
Benzo(k)fluoranthene	39000	2200	na	NT					NT					NT					NT					NT					NT					NT				
Chrysene	390000	22000	na	NT					NT					NT					NT					NT					NT					NT				
Dibenz(a,h)anthracene	390	22	na	NT					NT					NT					NT					NT					NT					NT				
Fluoranthene	4100000	310000	na	NT					NT					NT					NT					NT					NT					NT				
Indeno(1,2,3-cd)pyrene	3900	220	na	NT					NT					NT					NT					NT					NT					NT				
Phenanthrene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT				
Pyrene	3100000	230000	na	NT					NT					NT					NT					NT					NT					NT				
PCBs (mg/kg)																																						
Metals (mg/kg)																																						
Aluminum	100000	7800	40041	**53700**			*1.3*	*20.3*	31600			*1.2*	*18.5*	23800			*1.1*	*17.3*	38200			*1.2*	*18.3*	29200			*1.3*	*19.7*	26700			*1.2*	*18.6*	24200			*1.2*	*19.2*
Antimony	41	3.1	na	0.95	BN	B	*0.34*	*2*	1.1	BN	B	*0.3*	*1.8*	0.39	BN	B	*0.29*	*1.7*	0.6	UN		*0.6*	*3.7*	0.52	BN	B	*0.32*	*2*	0.41	BN	B	*0.31*	*1.9*	0.52	BN	B	*0.32*	*1.9*
Arsenic	1.9	0.43	15.8	10.1			*0.39*	*2*	10.3			*0.35*	*1.8*	9.9			*0.33*	*1.7*	12.8			*0.35*	*1.8*	8			*0.37*	*2*	8.7			*0.35*	*1.9*	10.3			*0.36*	*1.9*
Barium	20000	1600	209	181			*0.016*	*0.51*	95.6			*0.015*	*0.46*	27			*0.014*	*0.43*	28.7			*0.029*	*0.91*	62			*0.016*	*0.49*	88.1			*0.015*	*0.47*	32.8			*0.015*	*0.48*
Beryllium	200	16	1.02	**3.3**			*0.013*	*0.2*	**1.4**			*0.012*	*0.18*	0.88			*0.011*	*0.17*	0.89	E		*0.012*	*0.18*	**1.4**	**E**		*0.013*	*0.2*	**1.8**	**E**		*0.012*	*0.19*	0.99			*0.012*	*0.19*
Cadmium	51	3.9	0.69	0.09	B	B	*0.036*	*0.61*	0.074	B	B	*0.032*	*0.55*	0.03	U		*0.03*	*0.52*	0.064	U		*0.064*	*1.1*	0.24	B	B	*0.034*	*0.59*	0.3	B	J	*0.033*	*0.56*	0.14	B	J	*0.034*	*0.58*
Calcium	na	na	na	5180			*7.8*	*102*	7160			*7.1*	*92.3*	733			*6.7*	*86.7*	1490			*7*	*91.3*	5150			*7.6*	*98.5*	14700			*7.1*	*93.1*	2280			*7.4*	*96*
Chromium	310	23	65.3	**80.6**	**N***	**J**	*0.047*	*0.51*	57.3	N*	J	*0.042*	*0.46*	35.6	N*	J	*0.04*	*0.43*	52.2			*0.084*	*0.91*	40.3			*0.045*	*0.49*	62.8			*0.043*	*0.47*	38.4			*0.044*	*0.48*
Cobalt	na	na	72.3	12.9			*0.088*	*0.51*	12.5			*0.08*	*0.46*	7.2			*0.075*	*0.43*	18			*0.16*	*0.91*	17.9			*0.086*	*0.49*	9.3			*0.081*	*0.47*	10.3			*0.084*	*0.48*
Copper	4100	310	53.5	35.5			*0.089*	*1*	**258**			*0.081*	*0.92*	18.1			*0.076*	*0.87*	26.2			*0.16*	*1.8*	19			*0.087*	*0.98*	18.7			*0.082*	*0.93*	19.6			*0.084*	*0.96*
Iron	72000	5500	50962	47700			*3.3*	*15.2*	38800			*3*	*13.8*	35000			*2.8*	*13*	**51500**			*5.9*	*27.4*	31100			*3.2*	*14.8*	23700			*3*	*14*	33500			*3.1*	*14.4*
Lead	800	400	26.8	19.8			*0.13*	*1*	**163**			*0.12*	*0.92*	18.6			*0.11*	*0.87*	18.9			*0.24*	*1.8*	17			*0.13*	*0.98*	20.7			*0.12*	*0.93*	**33.3**			*0.12*	*0.96*
Magnesium	na	na	na	38500			*0.94*	*25.4*	7490			*0.86*	*23.1*	758			*0.81*	*21.7*	1010			*0.85*	*22.8*	3880			*0.92*	*24.6*	16500			*0.87*	*23.3*	1720	N	K	*0.89*	*24*
Manganese	2000	160	2543	294			*0.016*	*0.51*	230			*0.015*	*0.46*	127			*0.014*	*0.43*	262			*0.029*	*0.91*	145			*0.016*	*0.49*	220			*0.015*	*0.47*	136			*0.015*	*0.48*
Mercury	31	2.3	0.13	0.033	B	B	*0.018*	*0.037*	0.03	B	B	*0.017*	*0.034*	0.11		B	*0.017*	*0.033*	0.045			*0.017*	*0.034*	0.058			*0.014*	*0.029*	0.065			*0.015*	*0.029*	0.065			*0.017*	*0.034*
Nickel	2000	160	62.8	47.5			*0.062*	*1*	26.7			*0.056*	*0.92*	16.1			*0.053*	*0.87*	21.1			*0.056*	*0.91*	23			*0.06*	*0.98*	23.7			*0.057*	*0.93*	16.6			*0.059*	*0.96*
Potassium	na	na	na	2230	N		*3*	*25.4*	1380	N		*2.8*	*23.1*	990	N		*2.6*	*21.7*	1130	N		*2.7*	*22.8*	1480	N		*2.9*	*24.6*	1290	N		*2.8*	*23.3*	1170	N	K	*2.9*	*24*
Selenium	510	39	na	0.65	U		*0.65*	*2*	0.61	B	J	*0.59*	*1.8*	0.84	B	J	*0.56*	*1.7*	1.2	U		*1.2*	*3.7*	0.74	B	J	*0.63*	*2*	0.6	U		*0.6*	*1.9*	0.83	B	J	*0.61*	*1.9*
Sodium	na	na	na	77.6	B	B	*33*	*254*	99.8	B	B	*30*	*231*	53.9	B	B	*28.2*	*217*	88.4	B	B	*59.3*	*456*	81.6	B	B	*32*	*246*	84.4	B	B	*30.2*	*233*	66.5	B	B	*31.2*	*240*
Vanadium	102	7.8	108	99.8			*0.083*	*1*	73.3			*0.076*	*0.92*	68.5			*0.071*	*0.87*	98.6			*0.15*	*1.8*	63.4			*0.081*	*0.98*	56.8			*0.076*	*0.93*	65.6			*0.079*	*0.96*
Zinc	31000	2300	202	67.1			*0.58*	*2*	**315**			*0.53*	*1.8*	31.3			*0.49*	*1.7*	37.2			*1*	*3.7*	32.4			*0.56*	*2*	39.6			*0.53*	*1.9*	35.9			*0.55*	*1.9*

12 *J* Shading and black font indicates a i-RBC exceedance.

12 *J* Bold outline indicates a r-RBC exceedance.

12 ***J*** Bold, underlined font indicates a Background exceedance.

12 *12* Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.

The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.

Inorganic results below background UTLs are not indicated as exceedances on the table.

RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 6-4
Western Burning Ground
2004 Sediment Sample Results

Analyte	Sample ID			WBGSD16					WBGSD17					WBGSD18					WBGSD19					WBGSD20				
	Sample Date			7/16/04					7/22/04					7/22/04					7/22/04					7/22/04				
	Sample Depth			0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																												
Anthracene	31000000	2300000	na	78			*16*	*16*	NT					NT					NT					NT				
Benz(a)anthracene	3900	220	na	78		J	*16*	*16*	NT					NT					NT					NT				
Benzo(a)pyrene	390	22	na	87		J	*16*	*16*	NT					NT					NT					NT				
Benzo(b)fluoranthene	3900	220	na	170			*16*	*16*	NT					NT					NT					NT				
Benzo(g,h,i)perylene	3100000	230000	na	54		J	*16*	*16*	NT					NT					NT					NT				
Benzo(k)fluoranthene	39000	2200	na	53		J	*16*	*16*	NT					NT					NT					NT				
Chrysene	390000	22000	na	99		J	*16*	*16*	NT					NT					NT					NT				
Fluoranthene	4100000	310000	na	180		J	*16*	*16*	NT					NT					NT					NT				
Indeno(1,2,3-cd)pyrene	3900	220	na	60			*16*	*16*	NT					NT					NT					NT				
Phenanthrene	3100000	230000	na	74		J	*16*	*16*	NT					NT					NT					NT				
Pyrene	3100000	230000	na	120		J	*16*	*16*	NT					NT					NT					NT				
PCBs (mg/kg)	PCBs were not detected																											
Metals (mg/kg)																												
Aluminum	100000	7800	40041	19300			*1.7*	*25.9*	30900			*1.8*	*28.5*	23800			*1.9*	*29.4*	25400			*1.9*	*30.1*	20100			*2*	*31.7*
Antimony	41	3.1	na	0.43	UN		*0.43*	*2.6*	0.47	UN		*0.47*	*2.9*	0.49	UN	UL	*0.49*	*2.9*	0.75	BN	B	*0.5*	*3*	0.69	BN	B	*0.52*	*3.2*
Arsenic	1.9	0.43	15.8	9.6			*0.49*	*2.6*	8.5			*0.54*	*2.9*	5.5			*0.56*	*2.9*	6.1			*0.57*	*3*	4.5			*0.6*	*3.2*
Barium	20000	1600	209	63.3			*0.021*	*0.65*	108			*0.023*	*0.71*	105			*0.024*	*0.74*	112			*0.024*	*0.75*	119			*0.025*	*0.79*
Beryllium	200	16	1.02	**1.1**	**E**	**J**	*0.017*	*0.26*	**1.7**	**E**		*0.019*	*0.29*	**1.1**	**E**		*0.019*	*0.29*	**1.2**	**E**		*0.02*	*0.3*	0.9	E		*0.021*	*0.32*
Cadmium	51	3.9	0.69	0.045	U		*0.045*	*0.78*	0.47	B	B	*0.05*	*0.86*	0.46	B	B	*0.051*	*0.88*	0.49	B	B	*0.053*	*0.9*	0.44	B	B	*0.055*	*0.95*
Calcium	na	na	na	14500			*9.9*	*129*	69900			*10.9*	*143*	76500			*11.3*	*147*	65700			*11.6*	*150*	120000			*24.3*	*317*
Chromium	310	23	65.3	42.7			*0.12*	*1.3*	**80.6**			*0.066*	*0.71*	45.6			*0.068*	*0.74*	37.8			*0.069*	*0.75*	33			*0.073*	*0.79*
Cobalt	na	na	72.3	17.2			*0.11*	*0.65*	13.8			*0.12*	*0.71*	7.8			*0.13*	*0.74*	8.1			*0.13*	*0.75*	6.4			*0.14*	*0.79*
Copper	4100	310	53.5	19.3			*0.11*	*1.3*	24.5			*0.13*	*1.4*	19.1			*0.13*	*1.5*	19.2			*0.13*	*1.5*	15.6			*0.14*	*1.6*
Iron	72000	5500	50962	31500			*4.2*	*19.4*	27000			*4.6*	*21.4*	19900			*4.8*	*22.1*	22100			*4.9*	*22.6*	16400			*5.1*	*23.8*
Lead	800	400	26.8	**45.5**			*0.34*	*2.6*	**523**			*0.19*	*1.4*	**207**			*0.19*	*1.5*	**95**			*0.2*	*1.5*	**134**			*0.21*	*1.6*
Magnesium	na	na	na	4200	N	J	*2.4*	*64.7*	6610			*1.3*	*35.6*	4690			*1.4*	*36.8*	5010			*1.4*	*37.6*	4170			*1.5*	*39.6*
Manganese	2000	160	2543	1700			*0.041*	*1.3*	241			*0.023*	*0.71*	156			*0.024*	*0.74*	157			*0.024*	*0.75*	191			*0.025*	*0.79*
Mercury	31	2.3	0.13	0.041	B	J	*0.023*	*0.046*	0.067			*0.019*	*0.038*	0.052			*0.019*	*0.038*	0.04			*0.019*	*0.038*	0.033	B	J	*0.019*	*0.038*
Nickel	2000	160	62.8	17			*0.079*	*1.3*	22.7			*0.087*	*1.4*	16.4			*0.09*	*1.5*	16.5			*0.092*	*1.5*	13.2			*0.097*	*1.6*
Potassium	na	na	na	1140			*3.9*	*32.4*	1860	N		*4.2*	*35.6*	1210	N	K	*4.4*	*36.8*	1250	N		*4.5*	*37.6*	1060	N		*4.7*	*39.6*
Selenium	510	39	na	1.7	U		*1.7*	*5.2*	0.91	U		*0.91*	*2.9*	0.94	U		*0.94*	*2.9*	0.96	U		*0.96*	*3*	1	U		*1*	*3.2*
Sodium	na	na	na	123	B	B	*42.1*	*324*	237	B	B	*46.3*	*356*	233	B	B	*47.8*	*368*	251	B	B	*48.9*	*376*	243	B	B	*51.5*	*396*
Vanadium	102	7.8	108	52.8			*0.11*	*1.3*	55.5			*0.12*	*1.4*	41.5			*0.12*	*1.5*	43.3			*0.12*	*1.5*	35.5			*0.13*	*1.6*
Zinc	31000	2300	202	63.1			*0.74*	*2.6*	165			*0.81*	*2.9*	118			*0.84*	*2.9*	96.3			*0.86*	*3*	93.7			*0.9*	*3.2*

12 J	Shading and black font indicates a i-RBC exceedance.
12 J	Bold outline indicates a r-RBC exceedance.
12 **J**	Bold, underlined font indicates a Background exceedance.
12 *12*	Shading in the MDL/MRL columns indicates the MDL exceeds a criterion.

RBCs for non-Carcinogenic compounds have been recalculated to an HI of 0.1.
The pyrene RBCs and SSL were used for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
Inorganic results below background UTLs are not indicated as exceedances on the table.
RBC/SSL source: USEPA Region III Risk Based Concentration Table. April 2007.

Table 6-4
Western Burning Ground
2004 Sediment Sample Results

Analyte	Sample ID			WBGSD21					WBGSD22					WBGSD23					WBGSD24					WBGSD25				
	Sample Date			7/22/04					7/22/04					9/14/04					9/14/04					9/14/04				
	Sample Depth			0-0.5					0-0.5					0-0.5					0-0.5					0-0.5				
	i-RBC	r-RBC	Background	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PAHs (ug/kg)																												
Anthracene	31000000	2300000	na	NT					NT					NT					NT					NT				
Benz(a)anthracene	3900	220	na	NT					NT					NT					NT					NT				
Benzo(a)pyrene	390	22	na	NT					NT					NT					NT					NT				
Benzo(b)fluoranthene	3900	220	na	NT					NT					NT					NT					NT				
Benzo(g,h,i)perylene	3100000	230000	na	NT					NT					NT					NT					NT				
Benzo(k)fluoranthene	39000	2200	na	NT					NT					NT					NT					NT				
Chrysene	390000	22000	na	NT					NT					NT					NT					NT				
Fluoranthene	4100000	310000	na	NT					NT					NT					NT					NT				
Indeno(1,2,3-cd)pyrene	3900	220	na	NT					NT					NT					NT					NT				
Phenanthrene	3100000	230000	na	NT					NT					NT					NT					NT				
Pyrene	3100000	230000	na	NT					NT					NT					NT					NT				
PCBs (mg/kg)																												
Metals (mg/kg)																												
Aluminum	100000	7800	40041	18800			*1.8*	*27.8*	14400			*1.4*	*21.9*	28500			*1.6*	*25.7*	20000			*1.8*	*28.4*	19300			*1.7*	*26.3*
Antimony	41	3.1	na	0.46	UN		*0.46*	*2.8*	0.61	BN	B	*0.36*	*2.2*	0.51	BN	B	*0.42*	*2.6*	0.47	UN		*0.47*	*2.8*	0.43	UN		*0.43*	*2.6*
Arsenic	1.9	0.43	15.8	4.2			*0.53*	*2.8*	9.6			*0.42*	*2.2*	9.9			*0.49*	*2.6*	5.4			*0.54*	*2.8*	5.4			*0.5*	*2.6*
Barium	20000	1600	209	113			*0.022*	*0.7*	60.7			*0.018*	*0.55*	60.6			*0.021*	*0.64*	109			*0.023*	*0.71*	95.3			*0.021*	*0.66*
Beryllium	200	16	1.02	0.84	E		*0.018*	*0.28*	0.92	E		*0.014*	*0.22*	**1.9**			*0.017*	*0.26*	**1.1**			*0.018*	*0.28*	**1.1**			*0.017*	*0.26*
Cadmium	51	3.9	0.69	0.41	B	B	*0.049*	*0.83*	0.47	B	J	*0.038*	*0.66*	0.12	B	J	*0.045*	*0.77*	0.25	B	J	*0.05*	*0.85*	0.27	B	J	*0.046*	*0.79*
Calcium	na	na	na	101000			*21.4*	*278*	25700			*8.4*	*110*	29200			*9.9*	*128*	75100			*10.9*	*142*	63600			*10.1*	*131*
Chromium	310	23	65.3	43.1			*0.064*	*0.7*	**66.8**			*0.05*	*0.55*	54.7			*0.059*	*0.64*	34.2			*0.065*	*0.71*	31.4			*0.06*	*0.66*
Cobalt	na	na	72.3	6.5			*0.12*	*0.7*	8.1			*0.095*	*0.55*	17.4			*0.11*	*0.64*	7.9			*0.12*	*0.71*	7.3			*0.11*	*0.66*
Copper	4100	310	53.5	15.1			*0.12*	*1.4*	12			*0.096*	*1.1*	21.6			*0.11*	*1.3*	17.9			*0.12*	*1.4*	17.9			*0.12*	*1.3*
Iron	72000	5500	50962	16400			*4.5*	*20.9*	28600			*3.6*	*16.4*	27700			*4.2*	*19.3*	19400			*4.6*	*21.3*	19300			*4.3*	*19.7*
Lead	800	400	26.8	**276**			*0.18*	*1.4*	**112**			*0.14*	*1.1*	**152**			*0.17*	*1.3*	**79.8**			*0.18*	*1.4*	**37.6**			*0.17*	*1.3*
Magnesium	na	na	na	3700			*1.3*	*34.8*	1840			*1*	*27.4*	6820	N		*1.2*	*32.1*	4970	N		*1.3*	*35.4*	4390	N		*1.2*	*32.9*
Manganese	2000	160	2543	158			*0.022*	*0.7*	163			*0.018*	*0.55*	91.1			*0.021*	*0.64*	143			*0.023*	*0.71*	129			*0.021*	*0.66*
Mercury	31	2.3	0.13	0.041	B	J	*0.02*	*0.041*	0.036			*0.017*	*0.034*	0.076			*0.024*	*0.048*	0.055			*0.025*	*0.049*	0.049	B	J	*0.025*	*0.05*
Nickel	2000	160	62.8	12.2			*0.085*	*1.4*	10.9			*0.067*	*1.1*	24			*0.078*	*1.3*	14.6			*0.086*	*1.4*	14.2			*0.08*	*1.3*
Potassium	na	na	na	975	N		*4.1*	*34.8*	698	N		*3.3*	*27.4*	2120	N		*3.8*	*32.1*	1290	N		*4.2*	*35.4*	973	N		*3.9*	*32.9*
Selenium	510	39	na	0.89	U		*0.89*	*2.8*	1.2	B	J	*0.7*	*2.2*	0.82	U		*0.82*	*2.6*	0.91	U		*0.91*	*2.8*	0.84	U		*0.84*	*2.6*
Sodium	na	na	na	235	B	B	*45.2*	*348*	144	B	B	*35.6*	*274*	182	B	B	*41.7*	*321*	232	B	B	*46.1*	*354*	197	B	B	*42.7*	*329*
Vanadium	102	7.8	108	33.8			*0.11*	*1.4*	57.4			*0.09*	*1.1*	56.2			*0.11*	*1.3*	38.1			*0.12*	*1.4*	37.2			*0.11*	*1.3*
Zinc	31000	2300	202	121			*0.79*	*2.8*	59.3			*0.62*	*2.2*	59.9			*0.73*	*2.6*	82.2			*0.81*	*2.8*	71.3			*0.75*	*2.6*

Table 6-5
Western Burning Ground
Fish Tissue Sample Results

Sample ID	WBGTS01					WBGTS02					WBGTS03					WBGTS04					WBGTS05					WBGTS06				
Sample Date	7/21/04					7/21/04					7/21/04					7/21/04					7/21/04					7/21/04				
Sample Depth	NA-NA					NA-NA					NA-NA					NA-NA					NA-NA					NA-NA				
Analyte	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (mg/kg)	PCBs were not detected in the samples																													
Metals (mg/kg)																														
Aluminum	19.7			*7*	*7*	24.9			*7.4*	*7.4*	11.3			*7.5*	*7.5*	7.6	U		*7.6*	*7.6*	34.7			*7.3*	*7.3*	7.5	U		*7.5*	*7.5*
Barium	1.8			*0.17*	*0.17*	2.1			*0.19*	*0.19*	1			*0.19*	*0.19*	0.88			*0.19*	*0.19*	0.84			*0.18*	*0.18*	2			*0.19*	*0.19*
Calcium	8940	N		*34.8*	*34.8*	14300	N		*37.2*	*37.2*	9360	N		*37.3*	*37.3*	9970	N		*38.2*	*38.2*	7390	N		*36.5*	*36.5*	10700	N		*37.3*	*37.3*
Chromium	0.26			*0.17*	*0.17*	0.44			*0.19*	*0.19*	0.35			*0.19*	*0.19*	0.65			*0.19*	*0.19*	0.47			*0.18*	*0.18*	0.3			*0.19*	*0.19*
Copper	0.56			*0.35*	*0.35*	0.47			*0.37*	*0.37*	0.37	U		*0.37*	*0.37*	0.44			*0.38*	*0.38*	0.36	U		*0.36*	*0.36*	0.45			*0.37*	*0.37*
Iron	44.8			*5.2*	*5.2*	60.4			*5.6*	*5.6*	38.9			*5.6*	*5.6*	30.1			*5.7*	*5.7*	70.6			*5.5*	*5.5*	24			*5.6*	*5.6*
Magnesium	286			*8.7*	*8.7*	402			*9.3*	*9.3*	356			*9.3*	*9.3*	275			*9.5*	*9.5*	313			*9.1*	*9.1*	294			*9.3*	*9.3*
Manganese	2.3			*0.17*	*0.17*	3.5			*0.19*	*0.19*	1.7			*0.19*	*0.19*	1.4			*0.19*	*0.19*	1			*0.18*	*0.18*	2.7			*0.19*	*0.19*
Mercury	0.037			*0.019*	*0.019*	0.04			*0.02*	*0.02*	0.071			*0.019*	*0.019*	0.078			*0.02*	*0.02*	0.047			*0.018*	*0.018*	0.028			*0.019*	*0.019*
Potassium	2600	E	J	*17.4*	*17.4*	2590	E	J	*18.6*	*18.6*	2650	E	J	*18.7*	*18.7*	2720	E	J	*19.1*	*19.1*	2750	E	J	*18.2*	*18.2*	2640	E	J	*18.7*	*18.7*
Sodium	1140		J	*87.1*	*87.1*	1060		J	*92.9*	*92.9*	1190		J	*93.3*	*93.3*	1100		J	*95.4*	*95.4*	962		J	*91.2*	*91.2*	962		J	*93.3*	*93.3*
Zinc	15.3			*0.7*	*0.7*	25.1			*0.74*	*0.74*	20			*0.75*	*0.75*	17.2			*0.76*	*0.76*	16.8			*0.73*	*0.73*	13.7			*0.75*	*0.75*
Misc.																														
Percent Lipids	0.71			*0*	*0*	0.72			*0*	*0*	0.87			*0*	*0*	0.7			*0*	*0*	0.82			*0*	*0*	3.6			*0*	*0*

Table 6-5
Western Burning Ground
Fish Tissue Sample Results

Sample ID	WBGTS07					WBGTS08					WBGTS15					WBGTS16					WBGTS17				
Sample Date	7/21/04					7/21/04					7/21/04					7/21/04					7/21/04				
Sample Depth	NA-NA					NA-NA					NA-NA					NA-NA					NA-NA				
Analyte	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (mg/kg)																									
Metals (mg/kg)																									
Aluminum	50.7			*7.4*	*7.4*	14.9			*7.4*	*7.4*	7.8	U		*7.8*	*7.8*	7.5	U		*7.5*	*7.5*	7.4	U		*7.4*	*7.4*
Barium	2.4			*0.19*	*0.19*	0.75			*0.19*	*0.19*	0.19	U		*0.19*	*0.19*	0.24			*0.19*	*0.19*	0.25			*0.19*	*0.19*
Calcium	6280	N		*37*	*37*	5490	N		*37*	*37*	688	N		*38.9*	*38.9*	2180	N		*37.3*	*37.3*	1790	N		*37.2*	*37.2*
Chromium	0.63			*0.19*	*0.19*	0.42			*0.19*	*0.19*	0.19	U		*0.19*	*0.19*	0.19	U		*0.19*	*0.19*	0.19	U		*0.19*	*0.19*
Copper	0.47			*0.37*	*0.37*	0.8			*0.37*	*0.37*	0.39	U		*0.39*	*0.39*	0.56			*0.37*	*0.37*	0.37	U		*0.37*	*0.37*
Iron	74.2			*5.6*	*5.6*	31.2			*5.6*	*5.6*	5.8	U		*5.8*	*5.8*	5.6	U		*5.6*	*5.6*	5.6	U		*5.6*	*5.6*
Magnesium	262			*9.3*	*9.3*	270			*9.3*	*9.3*	262			*9.7*	*9.7*	236			*9.3*	*9.3*	232			*9.3*	*9.3*
Manganese	2			*0.19*	*0.19*	0.8			*0.19*	*0.19*	0.19	U		*0.19*	*0.19*	0.23			*0.19*	*0.19*	0.19	U		*0.19*	*0.19*
Mercury	0.028			*0.019*	*0.019*	0.024			*0.02*	*0.02*	0.056			*0.019*	*0.019*	0.087			*0.019*	*0.019*	0.03			*0.02*	*0.02*
Potassium	2670	E	J	*18.5*	*18.5*	2870	E	J	*18.5*	*18.5*	3170	E	J	*19.5*	*19.5*	2840	E	J	*18.7*	*18.7*	2990	E	J	*18.6*	*18.6*
Sodium	1010		J	*92.6*	*92.6*	717		J	*92.6*	*92.6*	693		J	*97.3*	*97.3*	902		J	*93.3*	*93.3*	858		J	*92.9*	*92.9*
Zinc	12.5			*0.74*	*0.74*	10.7			*0.74*	*0.74*	9.1			*0.78*	*0.78*	11.5			*0.75*	*0.75*	9.3			*0.74*	*0.74*
Misc.																									
Percent Lipids	3.2			*0*	*0*	6.1			*0*	*0*	0.05			*0*	*0*	0.07			*0*	*0*	0.67			*0*	*0*

Table 6-5
Western Burning Ground
Fish Tissue Sample Results

Sample ID	WBGTS18					WBGTS19					WBGTS20					WBGTS21					WBGTS22				
Sample Date	7/21/04					7/21/04					7/21/04					7/21/04					7/21/04				
Sample Depth	NA-NA					NA-NA					NA-NA					NA-NA					NA-NA				
Analyte	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL	Result	Lab Q	Val Q	MDL	MRL
PCBs (mg/kg)																									
Metals (mg/kg)																									
Aluminum	7.4	U		*7.4*	*7.4*	7.4	U		*7.4*	*7.4*	7.4	U		*7.4*	*7.4*	7.4	U		*7.4*	*7.4*	7.4	U		*7.4*	*7.4*
Barium	1			*0.18*	*0.18*	0.29			*0.18*	*0.18*	0.38			*0.19*	*0.19*	0.34			*0.19*	*0.19*	0.18	U		*0.18*	*0.18*
Calcium	8720	N		*36.8*	*36.8*	1650	N		*36.9*	*36.9*	2840	N		*37.2*	*37.2*	1130	N		*37*	*37*	604	N	L	*36.8*	*36.8*
Chromium	0.24			*0.18*	*0.18*	0.18	U		*0.18*	*0.18*	0.19	U		*0.19*	*0.19*	0.19	U		*0.19*	*0.19*	0.18	U		*0.18*	*0.18*
Copper	0.37	U		*0.37*	*0.37*	0.37	U		*0.37*	*0.37*	0.37	U		*0.37*	*0.37*	0.37	U		*0.37*	*0.37*	0.52			*0.37*	*0.37*
Iron	5.5	U		*5.5*	*5.5*	5.5	U		*5.5*	*5.5*	5.6	U		*5.6*	*5.6*	5.6	U		*5.6*	*5.6*	11.9			*5.5*	*5.5*
Magnesium	300			*9.2*	*9.2*	232			*9.2*	*9.2*	234			*9.3*	*9.3*	209			*9.3*	*9.3*	206			*9.2*	*9.2*
Manganese	0.76			*0.18*	*0.18*	0.18	U		*0.18*	*0.18*	0.24			*0.19*	*0.19*	0.53			*0.19*	*0.19*	0.18	U		*0.18*	*0.18*
Mercury	0.069			*0.02*	*0.02*	0.019	U		*0.019*	*0.019*	0.05			*0.02*	*0.02*	0.036			*0.02*	*0.02*	0.087			*0.02*	*0.02*
Potassium	2600	E	J	*18.4*	*18.4*	2900	E	J	*18.5*	*18.5*	2770	E	J	*18.6*	*18.6*	2850	E	J	*18.5*	*18.5*	2790	E	J	*18.4*	*18.4*
Sodium	1070		J	*91.9*	*91.9*	869		J	*92.3*	*92.3*	764		J	*92.9*	*92.9*	792		J	*92.6*	*92.6*	418		J	*91.9*	*91.9*
Zinc	13.5			*0.74*	*0.74*	9			*0.74*	*0.74*	11.2			*0.74*	*0.74*	8.6			*0.74*	*0.74*	6.9			*0.74*	*0.74*
Misc.																									
Percent Lipids	0.04			*0*	*0*	0.48			*0*	*0*	0.11			*0*	*0*	0.36			*0*	*0*	6.4			*0*	*0*

6.4 2007 Groundwater Investigation

Geophysical Survey. A geophysical survey was conducted to identify fracture zones or solution features that may provide a migration pathway from the burning ground to the unnamed pond located to the southwest where elevated levels of lead were detected in sediment. Resistivity profiling, using a RES Super Sting R8, was considered the most appropriate method for this purpose. The geophysical survey report is included as **Appendix C**.

Well Installation. One well was installed near the center of the former burning area where lead-containing soil was removed in 1998 (WBGMW-01). The purpose of this well was to characterize groundwater immediately below the burning area where lead-containing soil had been present. This well was installed in the first encountered groundwater at approximately 26 ft bgs. After development, recharge of the well was low, so the well was not sampled for TCL pesticides, PCBs or herbicides. The well was analyzed for TCL VOCs, TCL SVOCs/PAHs, TAL metals, explosives, dioxins/furans, perchlorate, TOC, and TOX.

Two additional wells were installed between the burning ground and the unnamed pond. Exploratory drilling in the this area did not find any bedrock lows or fracture zones, so the wells were installed above a prominent swale and on a flat area that indicated some re-working of the soil in the area. Both of these wells were installed at a depth of approximately 50 ft bgs. The locations of the three wells illustrated on **Figure 1-1**.

One round of groundwater sampling was conducted to provide an initial baseline assessment of groundwater quality. Since groundwater data has not been collected in any previous investigations, wells were sampled and analyzed for TCL VOCs, TCL SVOCs/PAHs, TCL pesticides/PCBs, herbicides, TAL metals, explosives, dioxins/furans, perchlorate, TOC, and TOX. Monitoring well WBGMW-01 was not analyzed for TCL pesticides/PCBs or herbicides due to the low volume of water in the well. Positive detections from the well samples are presented in **Table 1-2.** Laboratory Form Is, listing all analyzed compounds, are included in the Data Validation Reports in **Appendix D.**

7.0 REFERENCES

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Appendices and raw data are located on the CD-ROM in the back of the report binder