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Draft of the

Preliminary Evaluation

<u>of</u>

Pre (Floor Slab Removal) Contamination Beneath Selected Buildings at Load Lines 2, 3, 4

Ravenna Army Ammunition Plant 8451 St. Route 5 Ravenna, OH 44266-9297

Contract No. W912QR-04-D-0025 Delivery Order No. 0006

Prepared for:

U.S. Army Corps of Engineers 600 Martin Luther King, Jr. Place P.O. Box 59 Louisville, Kentucky 40201-0059



Prepared by:

URS Group, Inc.
1375 Euclid Avenue
Suite 600
Cleveland, Ohio 44115-1808



April 24, 2008

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6 B Screening Laboratory Documentation

1		Acronyms and Abbreviations
2	AEC	Army Environmental Command
3	BRACD	Base Realignment and Closure Division
4	CLIN	Contract Line Item
5	MARC	Multiple Award Remediation Contract
6	MKM	MKM Engineers, Inc.
7	Ohio EPA	Ohio Environmental Protection Agency
8	QC	Quality Control
9 10	RDX	Royal Demolition Explosive, also hexahydro-1,3,5-trinitro-1,3,5-triazine
11	RVAAP	Ravenna Army Ammunition Plant
12	SOP	Standard Operating Procedure
13	TNT	Trinitrotoluene, also 2,4,6-trinitrotoluene
14	URS	URS Group, Inc.
15	USACE	United States Army Corps of Engineers
16	UXO	Unexploded Ordnance
17		

SECTION ONE Introduction

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- The U.S. Army Corps of Engineers (USACE) Louisville District has awarded URS Group, Inc.
- 3 (URS) a Firm Fixed-Price contract for sampling of soils below floor slabs of demolished
- 4 buildings at Load Lines 2, 3, and 4, and excavation and transportation of contaminated soils to
- 5 Load Line 4 (Buildings G-1, G-1A, and G-3) at the Ravenna Army Ammunition Plant,
- 6 (RVAAP), Ravenna, Ohio. The work is a delivery order under the URS Multiple Award
- 7 Remediation Contract (MARC) (W912QR-04-D0025, Delivery Order 0006).
- 8 The removal of the majority of the buildings down to the floor slabs has been completed by
- 9 MKM Engineers, Inc. (MKM) under a contract from the Base Realignment and Closure Division
- 10 (BRACD). The BRACD has exercised a Contract Line Item (CLIN) to remove floor slabs and
- any associated foundation walls to grade at these buildings. Under contract to the Army
- 12 Environmental Command (AEC), Shaw E & I has completed its remediation of surface soils and
- dry sediments outside the footprints of the buildings at Load Lines 1, 2, 3, and 4.
- 14 Floor slab removal by the BRACD contractor began in March 2008 and will be completed in
- 15 May 2008. Work was sequenced so that the areas thought to represent the least potential for
- residual contamination were addressed first. Work began at Load Line 4 and progressed to Load
- 17 Lines 3 and 2. Within each load line, work was staged from one end of the load line to the other.
- 18 URS' Scope of Work is to complete both pre-slab removal sampling at selected buildings and
- 19 post-slab removal sampling at 105 buildings within Load Lines 2, 3, and 4. Evaluation of the
- 20 sampling results will be done to determine if any areas require excavation and transportation of
- earth fill from the load lines to buildings at Load Line 4 (i.e., Buildings G-1, G-1A, and G-3).
- 22 The SOW tasks are grouped into five primary tasks:
- Preparation of Plans,
 - Pre-Slab Removal Sampling and Evaluation,
- Characterization and Removal of Load Line 4 Piles,
- Post-Slab Removal Sampling and Evaluation, and
- Excavation and Transportation of Material to Load Line 4 Buildings.
- 28 This report addresses the field investigation and evaluates the sampling results for the pre-slab
- 29 removal sampling. This work was done in accordance with the Letter Report Work Plan
- 30 approved on February 7, 2008 (URS, 2008).

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- Sampling was conducted at two load lines where recent demolition activity left holes or other damage that allowed safe access to soil below the floor slabs. The purpose of this initial sampling was to provide a preliminary evaluation of the likelihood of explosives contamination beneath the floor slabs prior to the initiation of slab removal.
- 6 Field screening sampling was conducted at the following locations:
 - Load Line 2, Building DB-4, an area about 10 feet south and 15 feet west of the northeast corner of the building. This area is about 10 feet in diameter.
 - Load Line 3, Building EB-10, an area about 40 feet south of the north end of the building, midway east and west. This area is about 20 feet in diameter.
 - The samples were collected on March 21, 2008. Two discrete surface samples at the top of the earth fill and two samples at a 1-foot depth were collected from the area at Building DB-4. Three discrete samples at the top of the earth fill and three samples at a 1-foot depth were collected from the area at Building EB-10.
 - The area was observed and cleared by Unexploded Ordnance (UXO) personnel prior to any probing. The samples were collected using a stainless steel scoop and bowl at the top interval and with a step probe, where possible, at the deeper interval. The sampling was conducted in accordance with the *Facility-Wide Sampling and Analysis Plan* for Ravenna (SAIC, 2001). Most of the sampling points contained a large amount of concrete debris that prohibited the use of the step probe. Frozen conditions also hindered soil probe operation. Those areas where the step probe could not be used were sampled by removing the materials with a decontaminated hand mattock to 1 foot, where the sample was collected with a scoop and bowl. The samples were placed in new, sealable plastic bags and transported to the field screening laboratory in Building 1036. Field sampling forms from each location are included in Appendix A.
- The ten samples (five surface samples and 5 samples from a 1-foot depth) were analyzed for trinitrotoluene (TNT, or 2,4,6-trinitrotoluene) and Royal Demolition Explosive (RDX, or hexahydro-1,3,5-trinitro-1,3,5-triazine) using EnSys® soil test kits. The analyses were conducted in accordance with the manufacturer's instructions and standard operating procedures (SOPs). The analyses also followed the general procedures outlined in the RVAAP SOP for Field Colorimetric Analysis of Explosives (USACE, 2001).

The results of the screening analyses are summarized below:

3 4

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Table 1
Summary of Field Screening Analyses

Sample Number	TNT, mg/kg	RDX, mg/kg
LL2-DB4-SS-001SN-0001-SO	ND	1.6
LL2-DB4-SS-001SN-0002-SO	1.5	ND
LL2-DB4-SS-002SN-0001-SO	1.3	ND
LL2-DB4-SS-002SN-0002-SO	ND	1.4
LL3-EB10-SS-001SN-0001-SO	ND	ND
LL3-EB10-SS-001SN-0002-SO	ND	ND
LL3-EB10-SS-002SN-0001-SO	ND	ND
LL3-EB10-SS-002SN-0002-SO	ND	ND
LL3-EB10-SS-003SN-0001-SO	ND	ND
LL3-EB10-SS-003SN-0002-SO	ND	ND

ND: Nondetect result. The test kit detection limit for TNT is 0.7 mg/kg; the detection limit for RDX is 0.8 mg/kg.

The laboratory bench sheet for the analyses and the concentration calculations are included in Appendix B. All quality control (QC) checks (blanks and standards) were within acceptable ranges for the analyses.

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SECTION FOUR Conclusions

1 2 3

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Trinitrotoluene was detected in only two of the pre-slab removal screening samples. Both detections were at Building DB-4 at levels (1.5 and 1.3 mg/kg) well below the cleanup level of 1,636 mg/kg. The two detections of RDX were also at Building DB-4 and were at levels (1.4 and 1.6 mg/kg) well below the cleanup level of 838 mg/kg.

Based on this limited sampling, no evidence of explosive contamination above cleanup levels beneath the floor slabs was detected.

8

SECTION FIVE References

1	
2	SAIC. 2001b. Facility-Wide Sampling and Analysis Plan for Environmental Investigations at
3	the Ravenna Army Ammunition Plant, Ravenna, Ohio. Prepared for the U.S. Army
4	Corps of Engineers, Louisville District. March 2001.
5	URS. 2008. URS Group, Inc. Letter Report Work Plan for the Sampling of Soils Below Floor
6	Slabs at LLs-2,3,4 and Excavation and Transportation of Contaminated Soils to Load
7	<u>Line 4 (Buildings G-1, G-1A, and G-3).</u> Prepared for the U.S. Army Corps of Engineers,
8	Louisville District. Final. February 7, 2008.
9	USACE. 2001. U.S. Army Corps of Engineers. Standard Operating Procedure for Colorimetric
10	Analysis of Explosives. Final. March 16, 2001.
11	
12	
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14	P:\R\Ravenna AAP\13812319\DOCs\Reports\Pre-Slab_Removal\Draft_text_04-24_08.doc

APPENDIX A Field Sampling Forms

Location ID: LL 3 E B/C) -SS -00	51 SN - 0001 -Se	, I	Field	Sampling Re	port	RVAAP LL 2, 3, an	d 4 Sub-Sl	ab Sample, Rave	nna, OH		
Date: 3/21/08		<u>. </u>					·					
				Sam	pling Informat	ion						
Source /	Grou	ndwater / Product	/		Surface Wate	r , /	Soils	Soils / Sediments / Sludge				
Method	Bailer		/	Sampl	e Bottle	1	Scoop	1	Trowel	-		
	Pump			Bacon	Bomb		Bowl		Hand Auger			
			e e		7		Push Probe		Plastic Liner			
Type/Construction	- /			over the dis	1		Mattocks					
Miscellaneous	Well Purgi Yes - No	ing Form		/			200 A 100 A					
Sample Collection: 10/5 hrs	s	Sample Type	: Com	posite	- MI - Grab		Location	Plotted of	n Map - Staked in I	Field Surveyed		
Sample Depth: OFT	(below surfac	e) Decon:	Dedi	cated -	Each Day - Each	Location				:		
Field Parameters (at time of sample)		·	Analy	ytical I	Parameters		О	ther Par	ameters			
PID / FID Readings:		VOC					Corrosivity					
Background:	O₄ Ø ppm	svoc		<u> </u>		`	Reactivity Sulfide/Cy	/anide				
Sample:	ppm	Explosives (Selec	ted)	1	THT /ROX		Ignitability					
Water Level	FT	Metals (Selected)		-				· ·				
Temperature	ۍ	Perchlorate			-			QA Samples				
Sp. Conductance:	uMHOs	PCBs					MS/MSD	Yes / N	0	NA		
рН	units	Nitrate / Nitrite					Duplicate ID			NA		
Dissolved Oxygen	Mg/L	TPH DRO / HRO)				Equipment Rinse ID		·	NA		
Redox Potential	mV	Propellants					Trip Blank ID			NA		
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Date: 4-2-08

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	<u></u>		Sam	pling Informati	on					
Source	Groun	ndwater / Product		Surface Water	/	Soils / Sediments / Sludge				
Method	Bailer		Sample	e Bottle		Scoop	w/	Trowel		
	Pump		Bacon	Bomb		Bowl		Hand Auger		
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Sp. Conductance:	uMHOs	PCBs				MS/MSD	Yes / N	<u>vo</u>	NA	
pH	units	Nitrate / Nitrite				Duplicate ID	_/		NA	
Dissolved Oxygen	Mg/L	TPH DRO / HRO				Equipment Rinse ID			NA NA	
Redox Potential	mV	Propellants				Trip Blank ID			NA	
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			 			Ignitability			
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Dissolved Oxygen	Mg/L	TPH DRO / HRO	<u> </u>			Equipment Rinse ID			NA	
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	Pump		Bacor	i Bomb		Bowl		Hand Auge	ır	
						Push Probe		Plastic Lin	ет	
Type/Construction						Mattocks				
Miscellaneous	Well Purgi	ing Form	7							
Sample Collection:		Sample Type	If MT # o	f increments take:	ń:	Location:	Plotted o	n Map Stake	rd in Field ed - Surve	eyed
Sample Depth: OFF	l' (below surfac	e) Decon:	Dedicated -	Each Day Ea	ch Location					
Field Parameters (at time of sample)		A	nalytical	Parameters		O	her Par	ameters		
PID / FID Readings:		voc				Corrosivity				7
Background:	O. ppm	svoc				Reactivity Sulfide/Cy	anide			
Sample:		Explosives (Select	ted)			Ignitability				
Water Level	FT	Metals (Selected)								
Temperature	°c	Perchlorate		1			QA Saı	mples		
Sp. Conductance:	uMHOs	PCBs			<u> </u>	MS/MSD	Yes / N	¥0	N	NA.
рН	units	Nitrate / Nitrite				Duplicate ID			N/	Α
Dissolved Oxygen	Mg/L	TPH DRO/HRO				Equipment Rinse ID	<u> </u>		N/	<u>A</u>
Redox Potential	, mV	Propellants		. ,		Trip Blank ID		·	N/	<u>A</u>
Turbidity	N.T.U.	TWI/RDY	(V					in the second	Sample and the same of the sam	
L+ Brun Moin		le Description	~ ecr 60 ~ 5/25	1.1/45	Splic Samp		t Sample			
tant brich	(14-5	C/Whollow			Name:					
					Agency/C	ompany:				
					Address:					
		•		-						
				<u>:</u>						
Soil sample description shoul				* -	QA/QC P Paramete	rovided: MS/MSD Duplicate	Trip Blan S Listed	ks Field Blank		
Munsell Color Odor Si	taining Textur	e Sorting Plasticity	y Moisture							
Water sample description sho	uld include:			1	2					
Color Odor Sheen T	urbidity			s .						
	-					11.1	. C1	Λ		
Logged By: Tom GE	URLE	(Please	Print)			eviewed by: 10.6	11		4-2-	(case Print)
Signature: 700/	_				;	Signature: Alexa X	<u>u//_</u>	Date	7-6	UX

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TG- 112084 Location ID: 12084-SS -002 SN - 0002-S0				Sampling Re	port	RVAAP LL 2, 3, and 4 Sub-Slab Sample, Ravenna, OH				
Date: 3/2//0			•	. •						
Date:			Sam	pling Informat	ion					
Source Groundwater / Product Surface Water						Soils	/ Sedimen	ts / Sludge		
Method	Bailer		Sampl	Boule St. 1865		Scoop . Trowel				
	Pump		Bacon	The state of the s		Bowl		Hand Auger		
						Push Probe		Plastic Liner		
Type/Construction		·				Mattocks	100			
Miscellaneous	Well Purgi Yes - No	ng Form								
Sample Collection: 45 hr	- MI - Grab increments taken:		Location:	Plotted of	n Man - Staked in Fiel ed - Measured - Sur	veyed				
Sample Depth: FT	(below surfac	e) Decon: De	dicated -	Each Day Each	Location					
Field Parameters Analytical Parameters (at time of sample)						Ot	her Par	ameters		
PID / FID Readings:	VOC				Corrosivity			1_		
Background: ppm		svoc				Reactivity Sulfide/Cy	anide			
Sample:	g As	Explosives (Selected)			Ignitability					
Water Level	FT	Metals (Selected)								
Temperature	Temperature ° Perchlorate					QA Samples				
Sp. Conductance:	uMHOs	PCBs				MS/MSD	Yes / N	10	NA	
рН	units	Nitrate / Nitrite				Duplicate ID		1	NA	
Dissolved Oxygen	Mg/L	TPH DRO / HRO	· .			Equipment Rinse ID		·	NA	
Redox Potential	mV	Propellants				Trip Blank ID			NA 	
Turbidity	N.T.U.	TWIRDX	V							
Sample Description L+ Brown, moist, brushy saws, Trace						e Ditter of the second	Sample			
CORPLES tr. DILLS SW-SM					Name:					
43 crushed (print)					Agency/Cor	mpany:				
701501	<u></u>				Address:		/			
Soil sample description should	include:				QA/QC Pro	ovided: MS/N/80 Deplicate	Trip Blad	s Fiéld Blanks 1		
Munsell Color Odor Stat	ining Texture	e Sorting Plasticity M	oîsture		Parameter	: Same as Above - A	S-LASTOOL			
Water sample description shoul	d include:									
Color Odor Sheen Tu	rbidity									
-	وام ريد	F (Plana Pa	nt)		Per	riewed by:M, k_e	.54.	σΩ	(Please Print)	
Logged By: Tom (Signature: 70m 1)	>= OKV	(Please Pri	ш.)			ignature:	Sten	Date: 4-2		

× sheet

Temp (°F) (26 Balance Check

TNT and RDX Soll Test Worksheet RVAAP

> Date 3.21-68 Analyst R.P.

					TNT Analysis [540 nm]	onmi		RDX Analy	RDX Analysis [510 nm]	
	Date		L	Abs	Abstract	TNT Conc. ppm GL=1646	H	Abs	RDX Conc. ppm CL=838	Comments
Sample ID and a supplementary of the supplementary	Collected	palaelion	-				-	000.0		
Acetone Hererence Blank	i !	: :	-	:	0,002		-	0.00-0		
Sample Cell Dackglouing Green	,		-	780	2,00.0		-	0.01		
Calibration Standard		-	-		0.309	0.307 - 0.373	-		0,174 - 0.274	
1112DB4-SS-001SN-0001-SO	3/21/2008	ituS	-	6.209	0.537		7	3,000		
	3/21/2008	8011	-	6.472	6.356		-	0.010		
	3/21/2008	11.10	-	0.036	0.185		+	5 200		
	3/21/2008	1113	-	0.03	6:132			0.040		
	3/21/2008	1015	-	210-0	0.053		1	700		
	3/21/2008	1018		0.007	6.00.0		$\frac{1}{2}$	9 6		
	3/21/2008	1018	_	6-003	210.0		1	0.00		
_	3/21/2008	1620		6.427	230.0	į	4	0.815		
	3/21/2008	[623	_	0.010	0.025		\Rightarrow	0.010		
	3/21/2008	1025	1	8.428	S. 672		-	110.0		
	!	ł	ļ		0-00-0		7	0.000	A 4 4 4 6 6 9 4 4	
Calibration Check	;	:	-	l	0.307	0.307 - 0.373	1	2/10	0.174 - 0.274	
11113FB10-SS-003SN-0002-SO	3/21/2008	1028	_	5.00 €	0.0.0		\pm	٥٥٥		
	3/21/2008	1440		0.610	210.0		1	٥٠ و١ م		
	3/21/2008	1435		0،00	0.011		 	0.014		
<u> </u>	3/21/2008	1458		500.0	0.005		_	0.020		
3]	3/21/2008			200.0	700.0		1	0.025		
18 1 4 28-SB-004SN-0001-SO	3/21/2008	1515		J. c. 3	0.029		1	5/0-0		
	3/21/2008	1515		6.017	0.017		1	0.653		
18 14G8-SB-004SN-0003-SO	3/21/2008			5.013	0.015		1	6		
	3/21/2008	1515	_	6.011	0.012		7	3 X		
2011.4G8-SB-004SN-0005-SO	3/21/2008	1515	?	0.01	9,0,0		1			
	-	3	·	1	00000	0.207 - 0.373		1000	0.174 - 0.274	
Calibration Check	:	;	1		6:367	0.000	1			
DILUTIONS:			4		_		\bot			
			_				+	-		
			4				+	-		
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			4				ł			

P:IRIRavenna AAP113812319\DOCs\Data\TNT-RDX Bench Sheet Template

TNT Soil Test Worksheet RVAAP

	-16-4	01 for all profession (1995)		i compression		. I a commence and the		TNI-Conc.	
	Date Collected	Time Collected	Date Tested	ne			Result	(ррт)	Comments
Sample ID	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		A STATE OF THE PARTY OF THE PAR		Abs botto	Abs sample	TE TEOTIS TO SERVE		
LL4-G5-SS-001SN-0001-SO	3/14/2008	14:30	3/14/2008	1	0.011	0.012	-0.99	ND ND	<u> </u>
LL4-G5-SS-001SN-0001-SO-DUP	3/14/2008	14:30	3/14/2008	1.	0.006	0.002	-0.68 -9.26	ND	
LL2-DB4-SS-001SN-0001-SO	3/21/2008	11:05	3/21/2008	1 1	0.209	0.537		1.5	
LL2-DB4-SS-001SN-0002-SO	3/21/2008	11:08	3/21/2008	1	0.077	0.356	1.49	1.3	
LL2-DB4-SS-002SN-0001-SO	3/21/2008	11:10	3/21/2008	1 1	0.036		0.25	ND ND	
LL2-DB4-\$\$-002\$N-0002-\$O	3/21/2008	11:13	3/21/2008	1 1	0.031	0.132	0.25	ND	ļ
LL3-EB10-SS-001SN-0001-SO	3/21/2008	10:15	3/21/2008	1	0.012	0.053	-0.59	ND	
LL3-EB10-SS-001SN-0002-SO	3/21/2008	10:18	3/21/2008	1	0.007	0.009	0.00	ND ND	
LL3-EB10-SS-001SN-0002-SO-DUP	3/21/2008	10:18	3/21/2008	1 1	0.003	0.012	-0.12	ND	
LL3-EB10-SS-002SN-0001-SO	3/21/2008	10:20	3/21/2008	1 1	0.024	0.025	-0.12	ND	
LL3-EB10-SS-002SN-0002-SO	3/21/2008	10:23	3/21/2008	1 1	0.010	0.023	-1.24	ND	
LL3-EB10-SS-003SN-0001-SO	3/21/2008	10:25	3/21/2008	1 1	0.028	0.012	-0.06	ND	
LL3-EB10-SS-003SN-0002-SO	3/21/2008	10:28	3/21/2008	1 1	0.003	0.015	-0.00	ND ND	<u> </u>
LL4-G4-SS-002\$N-0001-SO	3/21/2008	14:40	3/21/2008	_	0.010	0.013	-0.03	ND	
LL4-G7-SS-003SN-0001-SO	3/21/2008	14:35	3/21/2008	1		0.005	-0.09	ND	Sample ID corrected
LL4-G12-SS-016SN-0001-SO	3/21/2008	14:58	3/21/2008	1 1	0.002	0.003	-0.03	ND ND	Sample to corrected
LL4-G13VP1-SS-017SN-0001-SO	3/21/2008	45.45	3/21/2008	-	0.002	0.029	0.53	ND	· · · · · · · · · · · · · · · · · · ·
LL4-G8-SB-004SN-0001-SO	3/21/2008	15:15	3/21/2008	1 1	0.003	0.029	-1.21	ND	
LL4-G8-SB-004SN-0002-SO	3/21/2008	15:15	3/21/2008	1 1	0.014		-1.15	ND	
LL4-G8-S8-004SN-0003-SO	3/21/2008	15:15	3/21/2008	1	0.013	0.015	-0.96	ND ND	
LL4-G8-SB-004SN-0004-SO	3/21/2008	15:15	3/21/2008	1 1	0.011		-0.96	ND	
LL4-G8-SB-004SN-0005-SO	3/21/2008	15:15	3/21/2008	1.	0.011	0.016	-2.76	ND ND	
LL4-G8-SB-005SN-0001-SO	3/21/2008	15:30	3/21/2008	1	0.043	0.083		ND ND	
LL4-G8-SB-005SN-0002-SO	3/21/2008	15:30	3/21/2008	1	0.273	0.541	-17.06	ND ND	ļ
LL4-G8-SB-005SN-0003-SO	3/21/2008	15:30	3/21/2008	1	0.017	0.045	-0.71 -1.49	ND ND	
LL4-G8-SB-005SN-0004-SO	3/21/2008	15:30	3/21/2008	1	0.022	0.040	-3.62	ND	
LL4-G8-SB-005SN-0005-SO	3/21/2008	15:30	3/21/2008	1	0.054	0.004	-0.37	ND	· · · · · · · · · · · · · · · · · · ·
LL4-G8-SB-006SN-0001-SO	3/21/2008	15:50	3/24/2008	1	0.004			ND	
LL4-G8-SB-006SN-0002-SO	3/21/2008	15:50	3/24/2008	1	0.002	0.002	-0.19 -0.28	ND	
LL4-G8-SB-006SN-0003-SO	3/21/2008	15:50	3/24/2008	1	0.003	0.003		ND ND	
LL4-G8-SB-006SN-0004-SO	3/21/2008	15:50	3/24/2008	1	0.004	0.004	-0.37 -0.06	ND	
LL4-G8-SB-006SN-0005-SO	3/21/2008	15:50	3/24/2008	1	0.001	0.002	-0.06	ND	
LL4-G8-SB-007SN-0001-SO	3/21/2008	18:15	3/24/2008	1	0.002	0.006		ND ND	
LL4-G8-SB-007SN-0002-SO	3/21/2008	18:15	3/24/2008	1	0.001	0.004	0.00	ND ND	
LL4-G8-SB-007SN-0003-SO	3/21/2008	18:15	3/24/2008	1	0.003	0.004	-0.25 -0.25	ND ND	
LL4-G8-SB-007SN-0004-SO	3/21/2008	18:15	3/24/2008	1	0.003	0.004		ND	
LL4-G8-SB-007SN-0005-SO	3/21/2008	18:15	3/24/2008	1.	0.002	0.004	-0.12 -0.12	ND	
LL4-G8-SB-008SN-0001-SO	3/21/2008	16:30	3/24/2008	1	0.002	0.004		ND	
LL4-G8-SB-008SN-0001-SO-DUP	3/21/2008	16:30	3/24/2008	1	0.000	0.002	0.06	ND	
LL4-G8-SB-008SN-0002-SO	3/21/2008	16:30	3/24/2008	1	0.001	0.002	-0.06	ND	
LL4-G8-SB-008SN-0003-SO	3/21/2008	16:30	3/24/2008	1	0.003	0.002	-0.31	ND ND	1000
LL4-G8-SB-008SN-0004-SO	3/21/2008	16:30	3/24/2008	1_	0.001	0.002	-0.06	ND ND	
LL4-G8-SB-008SN-0005-SO	3/21/2008	16:30	3/24/2008	1	0.003	0.004	-0.25 -0.03	ND	-
LL4-G8-SB-009SN-0001-SO	3/21/2008	16:45	3/24/2008	1	0.002	0.007		ND	
L14-G8-SB-009SN-0002-SO	3/21/2008	16:45	3/24/2008	1.	0.001	0.004	0.00	ND	ii
LL4-G8-SB-009SN-0003-SO	3/21/2008	16:45	3/24/2008	1.1	0.002	0.004	-0.12 -0.12	ND	
LL4-G8-SB-009SN-0004-SO	3/21/2008	16:45	3/24/2008	1	0.002	0.004		ND	
LL4-G8-SB-009SN-0005-SO	3/21/2008	16:45	3/24/2008	1	0.003	0.004	-0.25 -0.53	ND ND	
LL4-G8-SB-010SN-0001-SO	3/21/2008	17:05	3/24/2008	1	0.006	0.007		ND ND	
LL4-G8-SB-010SN-0002-SO	3/21/2008	17:05	3/24/2008	1	0.006	0.008	-0.50 -0.46	ND ND	
LL4-G8-SB-010SN-0003-SO	3/21/2008	17:05	3/24/2008	1	0.007			ND	
LL4-G8-SB-010SN-0004-SO	3/21/2008	17:05	3/24/2008	1	0.001	0.001	-0.09	ND ND	
		17:05	3/24/2008	1	0.000	0.000	0.00		
LL4-G8-SB-010SN-0005-SO	3/21/2008			1 1	0.006	0.014	-0.31	ND	ļ
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO	3/21/2008		3/24/2008		0.000	0.000	1 01	1 11	i
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO LL4-G8-SB-011SN-0002-SO	3/21/2008 3/21/2008		3/24/2008	1	0.000	0.039	1.21	1.2	
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO LL4-G8-SB-011SN-0002-SO LL4-G8-SB-011SN-0003-SO	3/21/2008 3/21/2008 3/21/2008		3/24/2008 3/24/2008	1	0.005	0.017	-0.09	ND	
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO LL4-G8-SB-011SN-0002-SO LL4-G8-SB-011SN-0003-SO LL4-G8-SB-011SN-0004-SO	3/21/2008 3/21/2008 3/21/2008 3/21/2008		3/24/2008 3/24/2008 3/24/2008	1 1	0.005 0.001	0.017 0.005	-0.09 0.03	ND ND	
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO LL4-G8-SB-011SN-0002-SO LL4-G8-SB-011SN-0003-SO LL4-G8-SB-011SN-0004-SO LL4-G8-SB-011SN-0005-SO	3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008		3/24/2008 3/24/2008 3/24/2008 3/24/2008	1 1 1	0.005 0.001 0.002	0.017 0.005 0.005	-0.09 0.03 -0.09	ND ND ND	
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO LL4-G8-SB-011SN-0002-SO LL4-G8-SB-011SN-0003-SO LL4-G8-SB-011SN-0004-SO LL4-G8-SB-011SN-0005-SO LL4-G8-SB-012SN-0001-SO	3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008	18:35	3/24/2008 3/24/2008 3/24/2008 3/24/2008 3/24/2008	1 1 1 1	0.005 0.001 0.002 0.002	0.017 0.005 0.005 0.004	-0.09 0.03 -0.09 -0.12	ND ND ND	
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO LL4-G8-SB-011SN-0002-SO LL4-G8-SB-011SN-0003-SO LL4-G8-SB-011SN-0004-SO LL4-G8-SB-011SN-0005-SO LL4-G8-SB-012SN-0001-SO LL4-G8-SB-012SN-0001-SO-DUP	3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008	18:35	3/24/2008 3/24/2008 3/24/2008 3/24/2008 3/24/2008 3/24/2008	1 1 1 1 1	0.005 0.001 0.002 0.002 0.001	0.017 0.005 0.005 0.004 0.002	-0.09 0.03 -0.09 -0.12 -0.06	ND ND ND ND	
LL4-G8-SB-010SN-0005-SO LL4-G8-SB-011SN-0001-SO LL4-G8-SB-011SN-0002-SO LL4-G8-SB-011SN-0003-SO LL4-G8-SB-011SN-0004-SO LL4-G8-SB-011SN-0005-SO LL4-G8-SB-012SN-0001-SO	3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008		3/24/2008 3/24/2008 3/24/2008 3/24/2008 3/24/2008	1 1 1 1	0.005 0.001 0.002 0.002	0.017 0.005 0.005 0.004	-0.09 0.03 -0.09 -0.12	ND ND ND	

RDX Soil Test Worksheet RVAAP

	Date.	Time					RDX Conc.	
Sample ID	Collected	Collected	Date Tested	DF	Abs	Result	(ppm)	Comments
LL4G5-SS-001SN-0001-SO	3/14/2008	14:30	3/14/2008	1	0.012	-0.09	ND	
LL4G5-SS-001SN-0001-SO-DUP	3/14/2008	14:30	3/14/2008	1	0.012	-0.09	ND	
LL2DB4-SS-001SN-0001-SO	3/21/2008	11:05	3/21/2008	1	0.049	1.56	1.6	
LL2DB4-SS-001SN-0002-SO	3/21/2008	11:08	3/21/2008	1	0.015	0.04	ND	
LL2DB4-SS-002SN-0001-SO	3/21/2008	11:10	3/21/2008	1	0.023	0.40	ND	
LL2DB4-SS-002SN-0002-SO	3/21/2008	11:13	3/21/2008	1	0.046	1.42	1.4	
LL3EB10-SS-001SN-0001-SO	3/21/2008	10:15	3/21/2008	1	0.012	-0.09	ND	
LL3EB10-SS-001SN-0002-SO	3/21/2008	10:18	3/21/2008	1	0.016	0.09	ND	
LL3EB10-SS-001SN-0002-SO-DUP	3/21/2008	10:18	3/21/2008	1	0.009	-0.22	ND	
LL3EB10-SS-002SN-0001-SO	3/21/2008	10:20	3/21/2008	1	0.013	-0.04	ND	
LL3EB10-SS-002SN-0002-SO	3/21/2008	10:23	3/21/2008	1	0.010	-0.18	ND	
LL3EB10-SS-003SN-0001-SO	3/21/2008	10:25	3/21/2008	1	0.011	-0.13	ND	
LL3EB10-SS-003SN-0002-SO	3/21/2008	10:28	3/21/2008	1	0.006	-0.36	ND	
LL4G4-SS-002SN-0001-SO	3/21/2008	14:40	3/21/2008	1	0.019	0.22	ND	
LL4G7-SS-003SN-0001-SO	3/21/2008	14:35	3/21/2008	1	0.014	0.00	ND	
LL4G12-SS-016SN-0001-SO	3/21/2008	14:58	3/21/2008	1	0.020	0.27	ND	Sample ID corrected
LL4G13VP1-SS-017SN-0001-SO	3/21/2008		3/21/2008	1	0.025	0.49	ND	
LL4G8-SB-004SN-0001-SO	3/21/2008	15:15	3/21/2008	1	0.015	0.04	ND	
LL4G8-SB-004SN-0002-SO	3/21/2008	15:15	3/21/2008	1	0.031	0.76	ND	
LL4G8-SB-004SN-0003-SO	3/21/2008	15:15	3/21/2008	1	0.016	0.09	ND	
LL4G8-SB-004SN-0004-SO	3/21/2008	15:15	3/21/2008	1	0.032	0.80	0.8	
LL4G8-SB-004SN-0005-SO	3/21/2008	15:15	3/21/2008	1	0.008	-0.27	ND	
LL4G8-SB-005SN-0001-SO	3/21/2008	15:30	3/21/2008	1	0.015	0.04	ND	
LL4G8-SB-005SN-0002-SO	3/21/2008	15:30	3/21/2008	1	0.031	0.76	ND	
LL4G8-SB-005SN-0003-SO	3/21/2008	15:30	3/21/2008	1	0.015	0.04	ND	
LL4G8-SB-005SN-0004-SO	3/21/2008	15:30	3/21/2008	1	0.014	0.00	ND	
LL4G8-SB-005SN-0005-SO	3/21/2008	15:30	3/21/2008	1	0.012	-0.09	ND	
LL4G8-SB-006SN-0001-SO	3/21/2008	15:50	3/24/2008	1	0.018	0.18	ND	
LL4G8-SB-006SN-0002-SO	3/21/2008	15:50	3/24/2008	1	0.017	0.13	ND	
LL4G8-SB-006SN-0003-SO	3/21/2008	15:50	3/24/2008	1	0.013	-0.04	ND	
LL4G8-SB-006SN-0004-SO	3/21/2008	15:50	3/24/2008	1	0.014	0.00	ND	
LL4G8-SB-006SN-0005-SO	3/21/2008	15:50	3/24/2008	1	0.004	-0.44	ND	
LL4G8-SB-007SN-0001-SO	3/21/2008	18:15	3/24/2008	1	0.018	0.18	ND	
LL4G8-SB-007SN-0001-30	3/21/2008	18:15	3/24/2008	1	0.019	0.22	ND	
LL4G8-SB-007SN-0002-SO	3/21/2008	18:15	3/24/2008	1	0.016	0.09	ND	
LL4G8-SB-007SN-0004-SO	3/21/2008	18:15	3/24/2008	T	0.017	0.13	ND	
LL4G8-SB-007SN-0005-SO	3/21/2008	18:15	3/24/2008	1 1	0.003	-0.49	ND	
LL4G8-SB-008SN-0001-SO	3/21/2008	16:30	3/24/2008	ΙŤ	0.010	-0.18	ND	
LL4G8-SB-008SN-0001-SO-DUP	3/21/2008	16:30	3/24/2008	1	0.013	-0.04	ND	
LL4G8-SB-008SN-0002-SO	3/21/2008	16:30	3/24/2008	1	0.011	-0.13	ND	
LL4G8-SB-008SN-0002-SO	3/21/2008	16:30	3/24/2008	1	0.013	-0.04	ND	
LL4G8-SB-008SN-0004-SO	3/21/2008	16:30	3/24/2008	1	0.014	0.00	ND	
LL4G8-SB-008SN-0004-SO	3/21/2008	16:30	3/24/2008	1	0.014	0.00	ND	
LL4G8-SB-009SN-0001-SO	3/21/2008	16:45	3/24/2008	1	0.015	0.04	ND	
LL4G8-SB-009SN-0002-SO	3/21/2008	16:45	3/24/2008	1	0.016	0.09	ND	
LL4G8-SB-009SN-0002-SO	3/21/2008	16:45	3/24/2008	1	0.016	0.09	ND	
7 LL4G8-SB-009SN-0004-SO	3/21/2008	16:45	3/24/2008	1	0.014	0.00	ND	
LL4G8-SB-009SN-0005-SO	3/21/2008	16:45	3/24/2008	1	0.015	0.04	ND	
LL4G8-SB-010SN-0001-SO	3/21/2008	17:05	3/24/2008	1 1	0.013	-0.04	ND	
LL4G8-SB-010SN-0001-30	3/21/2008	17:05	3/24/2008	1 1	0.013	-0.04	ND	
LL4G8-SB-010SN-0002-30	3/21/2008	17:05	3/24/2008	+ †	0.010	-0.18	ND	
LL4G8-SB-010SN-0003-SO	3/21/2008	17:05	3/24/2008	Ιi	0.014	0.00	ND	<u> </u>
B LL4G8-SB-010SN-0004-SO	3/21/2008	17:05	3/24/2008	ΗŤ	0.014	0.00	ND	
LL4G8-SB-011SN-0005-SO	3/21/2008	17,00	3/24/2008	1	0.072	2.58	2.6	
	3/21/2008	 	3/24/2008	1	0.012	-0.13	ND	
5 LL4G8-SB-011SN-0002-SO	3/21/2008	+	3/24/2008	1 1	0.009	-0.22	ND	
LL4G8-SB-011SN-0003-SO		 	3/24/2008	 	0.003	-0.09	ND ND	
7 LL4G8-SB-011SN-0004-SO	3/21/2008	 	3/24/2008	1	0.012	-0.04	ND ND	
B LL4G8-SB-011SN-0005-SO	3/21/2008	10.25	3/24/2008	+ +	0.013	0.09	ND ND	
9 LL4G8-SB-012SN-0001-SO	3/21/2008	18:35	3/24/2008	+ +	0.014	0.00	ND ND	
LL4G8-SB-012SN-0001-SO	3/21/2008	18:35		+	0.004	-0.44	ND ND	
1 LL4G8-SB-012SN-0002-SO	3/21/2008	18:35	3/24/2008		U.004	L	1 110	<u> </u>