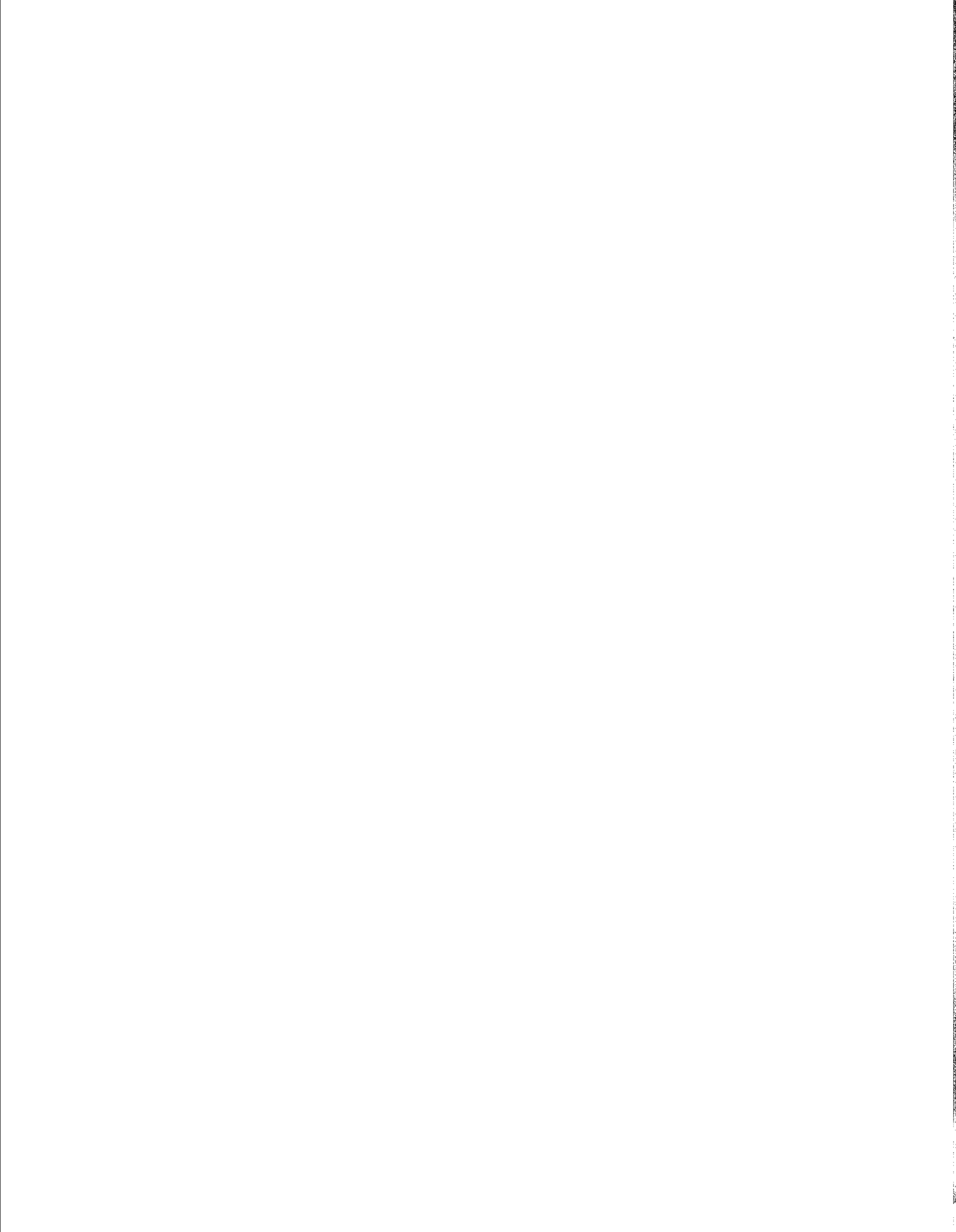


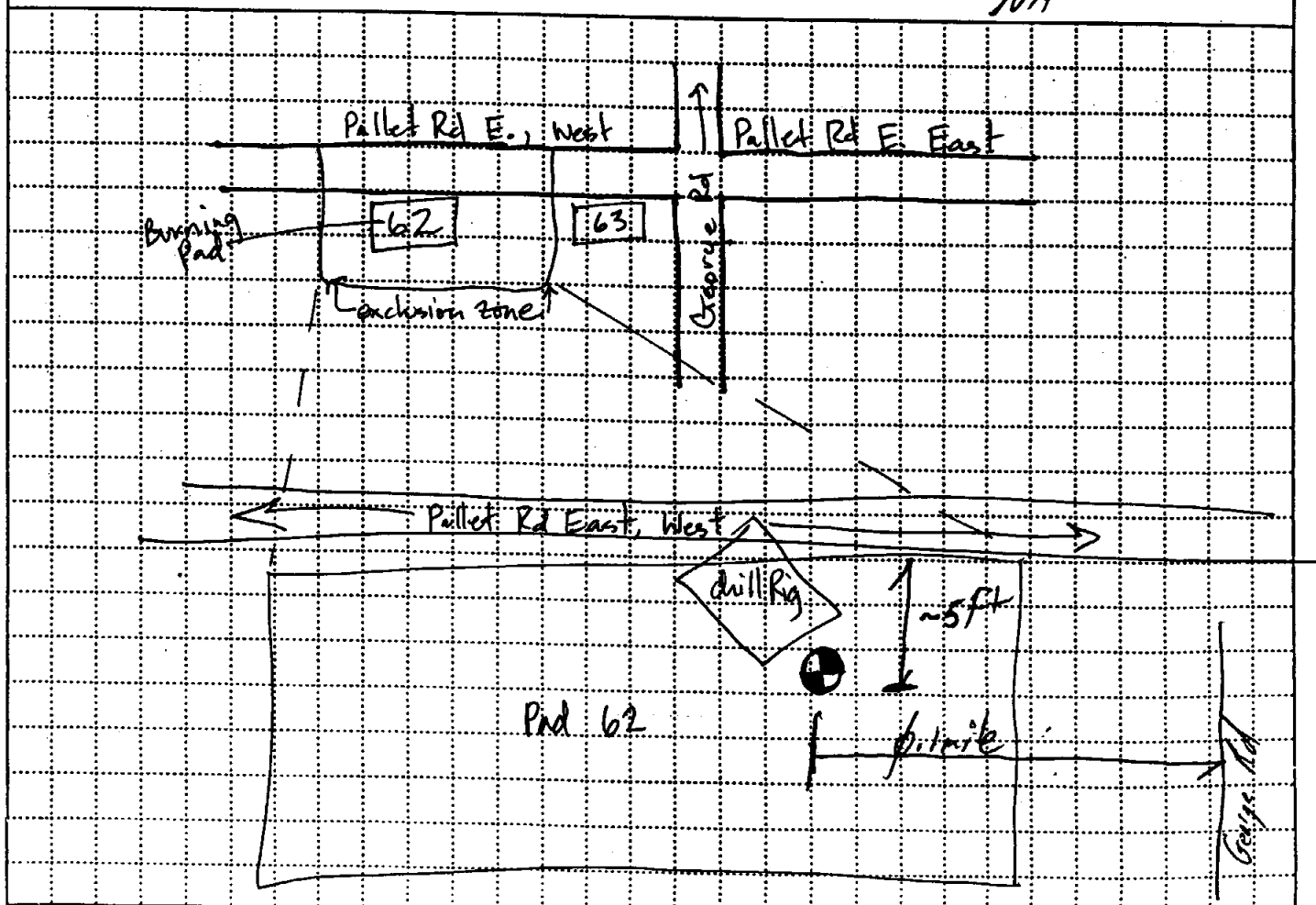
APPENDIX A
DRILLING LOGS AND MAPS



HTRW DRILLING LOG		DISTRICT <i>Louisville Corps</i>		HOLE NUMBER <i>WBG mw-005</i>	
1. COMPANY NAME <i>SAIC</i>		2. DRILL SUBCONTRACTOR <i>Boussier & Moyle</i>		SHEET SHEETS <i>1 OF 2</i>	
3. PROJECT <i>Phase II RI @ Winkley Creek Pumping Canal and Background Invest.</i>			4. LOCATION <i>RVAAP</i>		
5. NAME OF DRILLER <i>Magnard Labiti</i>			6. MANUFACTURERS DESIGNATION OF DRILL <i>Failing F-7</i>		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT <i>4 1/2" ID HSA's</i> <i>4" Continuous Split Barrel / 3 ft length</i> <i>3" ID Shelby Tube / 2.5 ft length</i>			8. HOLE LOCATION <i>W. side of WBG, NE corner of pad #02</i>		
12. OVERBURDEN THICKNESS <i>NA</i>			9. SURFACE ELEVATION <i>1052.198</i>		
13. DEPTH DREADED INTO ROCK <i>NA</i>			10. DATE STARTED <i>22 Apr 98</i>		
14. TOTAL DEPTH OF HOLE <i>19.0 ft</i>			11. DATE COMPLETED <i>22 Apr 98</i>		
18. GEOTECHNICAL SAMPLES			DISTURBED		UNDISTURBED
20. SAMPLES FOR CHEMICAL ANALYSIS			VOC		METALS
22. DISPOSITION OF HOLE			BACKFILLED		MONITORING WELL
					OTHER (SPECIFY)
					OTHER (SPECIFY)
					OTHER (SPECIFY)
					21. TOTAL CORE RECOVERY % <i>NA</i>
					23. SIGNATURE OF INSPECTOR <i>[Signature]</i>

LOCATION SKETCH/COMMENTS

Not to SCALE: *NA*



PROJECT <i>RVAAP</i>	A-3	HOLE NO. <i>WBG mw-005</i>
-------------------------	-----	-------------------------------

DRILLING LOG

PROJECT		INSPECTOR			HOLE NUMBER	
RVAAP Phase II RI		Brad Baker			WBG MW-005	
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	1	0-1.5 ft Sandy SILT; sand: fine-med ~30%, silt ~70%; Med Greenish Gray; subangular; poorly sorted; low plasticity; moist (ML)	LEL-0% O _c -21% PSD-0.1% TD-0.1% NA	NA	NA	0-4 ft run Spun without break apart core recovered and logged back @ field office - had to heat barrel to expose core 3.8' recovery (~95%)
	2	1.5-3.8 ft Sandy SILT; sand: med ~30% silt ~70% Lt Yellowish Brown variegated gray yellowish orange, and black; poorly sorted, subangular; low-med plasticity; hard, moist (ML)				
	3	Silty SAND; sand: med ~60%, silt ~30%, clay ~10%; Med reddish Brown w/ ft gray clay present; subangular; poorly sorted; low plasticity; v. soft; moist (SM)	O ₂ -21% LEL-0% PSD 0.1%	NA	NA	4-9 ft run (52% recovery) - saturated cuttings, sand present @ 6 ft bls. - 1930 Breaking spoon and allowing groundwater to equilibrate - currently no H ₂ O detected down hole Tapped bottom of hole @ 9.0 ft
	4					
	5					
	6					
	7					
	8					
	9					
	10	Clay; clay ~96%, sand: granular ~2%; Med Gray; poorly sorted; mod plasticity; firm; moist (CL)	LEL-0% O _c -21% PSD-0.1%	NA	NA	Free H ₂ O present w/ cuttings @ 11 ft bls 9-14 ft run 1.6 ft recovery (~30%) - H ₂ O tapped @ 14.55 ft from top of auger @ 1015 hrs - H ₂ O @ 12.66 ft top of auger's 1030 hr - 1.7 ft auger sticky ∴ 10.96 ft bls
	11					
	12					
	13					
	14					
	15		CEL-0% O ₂ -21% PSD-0.1%	WB0858	NA	Shabby Tube Advanced 7.5 ft refusal (14-15.5 ft bls)
	16					
	17	CLAY; clay ~90%, sand: med ~20% Med Gray; interbedded sand; poorly sorted, subangular; mod plasticity; firm; v. moist - saturated (CL)	LEL-0% O ₂ -21% PSD-0.1%	NA	NA	14-19 ft run 1.8 ft recovery (~35%) cuttings remained saturated during drill of run 1130 hr H ₂ O @ 13.88 ft bls 1300 hr H ₂ O @ 5.18 ft bls
	18					
	19					
		TD=19.0 ft				
			A-4			

ELEV. 1052.198

PROJECT

RVAAP Phase II RI

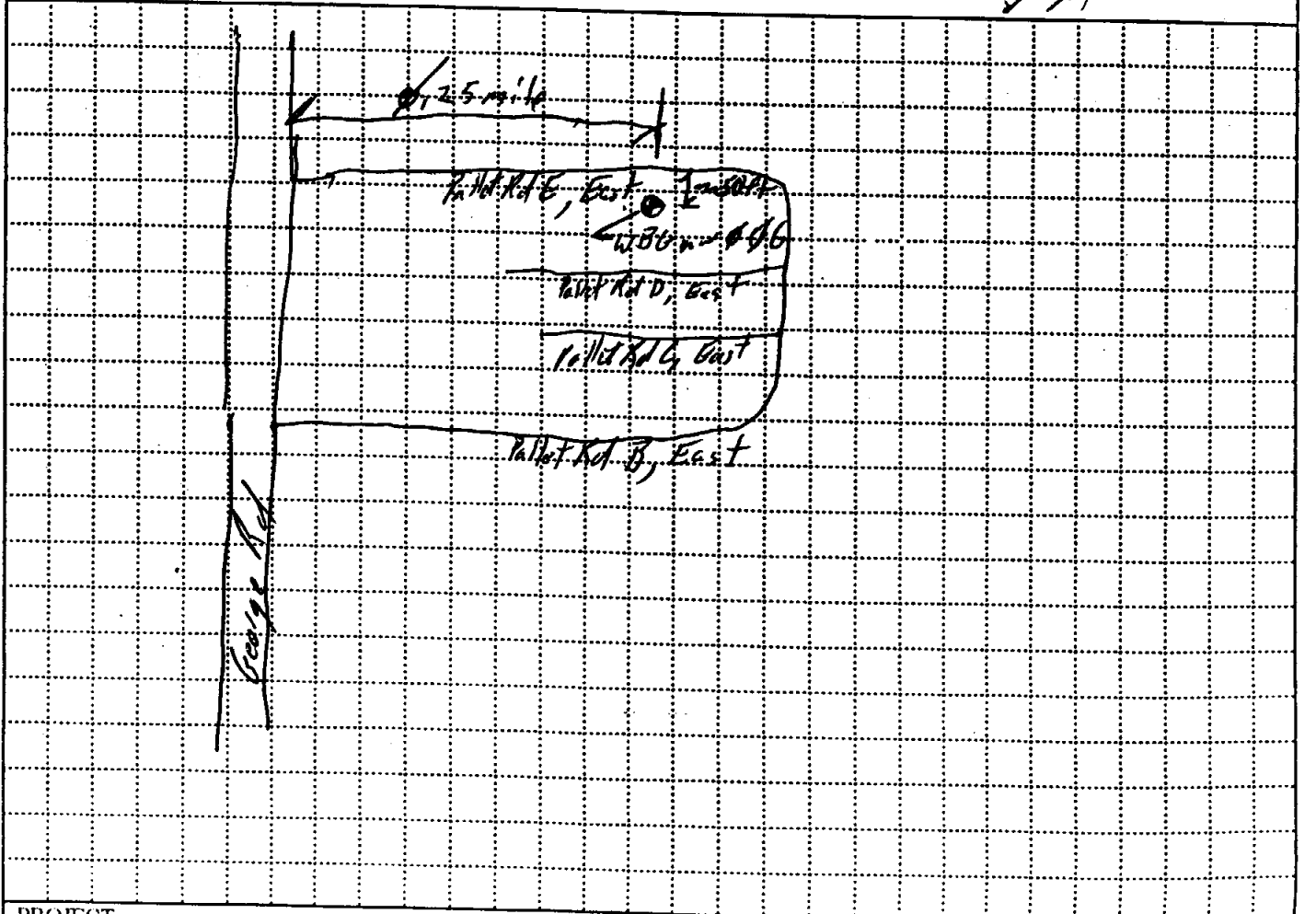
N 563037.1770
E 725711.25420

HOLE NO

WBG MW-005

HTRW DRILLING LOG		DISTRICT <i>Louisville Corp</i>		HOLE NUMBER <i>WB6mw-006</i>	
1. COMPANY NAME <i>SATC</i>		2. DRILL SUBCONTRACTOR <i>Rowson & Mays</i>		SHEET <i>1</i> OF <i>1</i>	
3. PROJECT <i>Phase II RI @ Whiteoak Business Center and Biological Treatment</i>			4. LOCATION <i>RVAAP</i>		
5. NAME OF DRILLER <i>Magnus Lohfi</i>			6. MANUFACTURERS DESIGNATION OF DRILL <i>Feilig F-7</i>		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT <i>4 1/2" ID HSA 4" @ Continuous Split Barrel / 15ft long 3" @ Shelby Tube / 2.5 ft long</i>			8. HOLE LOCATION <i>NEWBG, corner of pad #67</i>		
12. OVERBURDEN THICKNESS <i>NA</i>			10. DATE STARTED <i>24 Apr 96</i>		11. DATE COMPLETED <i>25 Apr 96</i>
13. DEPTH DRILLED INTO ROCK <i>NA</i>			15. DEPTH GROUNDWATER ENCOUNTERED <i>9.0 ft</i>		
14. TOTAL DEPTH OF HOLE <i>19.0 ft</i>			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED <i>NA</i>		
18. GEOTECHNICAL SAMPLES		DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES <i>NA</i>	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)
22. DISPOSITION OF HOLE		<i>NA</i>	<i>NA</i>	<i>NA</i>	21. TOTAL CORE RECOVERY % <i>~80</i>
			BACKFILLED	MONITORING WELL	OTHER (SPECIFY)
					23. SIGNATURE OF INSPECTOR <i>[Signature]</i>

LOCATION SKETCH/COMMENTS SCALE: *NA*



PROJECT <i>RVAAP</i>	A-5	HOLE NO. <i>WB6mw-006</i>
-------------------------	-----	------------------------------

DRILLING LOG

PROJECT		INSPECTOR			HOLE NUMBER	
RVAAP		David Fisher			WB6 MW-006	
DEPTH (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0-0.8 ft	Silty CLAY; sand: med-fine ~15% silt ~25% clay 60%; med gray poorly sorted; subrounded; mod plasticity; soft; v. moist; (CL)	PID-0ppm LEL-0% O ₂ -21%	N/A	N/A	1-4 ft run 3.5 recovery 87%
4	0.8-3.5 ft	SAME AS ABOVE w/ color change Med Yellowish Brown w/ varigote gray clay (CL)				
	4.0-6.3' same as above					4-9 ft run 100% recovery
	6.3-8.8'	SAME AS ABOVE except color change: Med Yellowish Brown w/ pale yellow mottling; slightly finer; hard (CL); low plasticity	PID 0ppm LEL-0% O ₂ -21%	N/A	N/A	
9	8.8-9.0'	SAND; sand: med ~75% gravel ~10%, silt ~15%; reddish brown; subrounded; med sorted; no plasticity; soft; wet (SM)				
			PID 0ppm LEL-0% O ₂ -21%		N/A	Pushed Shelby Tube 100% Recovery 9.0-10.8 ft record
10.8	10.8-12.3 ft	Sandy SILT sand: med-fine ~35%, silt ~65%; Med Yellowish Brown; subrounded; poorly sorted; mod plasticity; soft; saturated (ML)	PID-0ppm LEL-0% O ₂ -21%	N/A		157# H ₂ O trapped @ 5.86 ft bgs Run 10.8-14.0 ft run 4.5 ft recovery 100% recovery
	12.3-13.3 ft	CLAY; sand: v. fine ~10% clay 90%; bluish gray; hard; poorly sorted; subrounded; med-low plasticity; (CL)				
	13.3-14.0 ft	Sandy SILT; sand: fine ~30% silt ~70% Med Yellowish Brown; subrounded; poorly sorted; low plasticity; soft; saturated (ML)				
14	14-15.8 ft	Silty SAND; sand & fine ~60% silt ~30%; gravel ~10%; Yellowish Brown; poorly sorted; subrounded; no plasticity; soft/loose; saturated (SM)	PID-0ppm LEL-0% O ₂ -21%	N/A	N/A	14-19 ft bgs 1.8 ft recovery (~40%)
19		TD = 17 ft				

PROJECT RVAAP N 563008.8670 ELEV. 1012.156
E 2359087.7930

HOLE NO. WB6 MW-006

HTRW DRILLING LOG		INSTRUCT		HOLE NUMBER	
1. COMPANY NAME SAIC		Louisville Corps		WB5mw-007	
3. PROJECT Phase II RI W. Kentucky Burned & Background Invest.		2. DRILL SUBCONTRACTOR "Bourse" Marge		SHEET 1 OF 2	
5. NAME OF DRILLER Magnard Labri		4. LOCATION RVAAP		6. MANUFACTURER'S DESIGNATION OF DRILL Failing P-7	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/2" ID HSA's 4" Continuous Split Barrel / 5 ft length 3" Shelby Tube / 2.5 ft length		8. HOLE LOCATION E. end of WBC, NE of pad # 41		9. SURFACE ELEVATION 998.091	
12. OVERBURDEN THICKNESS NA		10. DATE STARTED 23 Apr 98		11. DATE COMPLETED 24 Apr 98	
13. DEPTH DILLED INTO ROCK NA		15. DEPTH GROUNDWATER ENCOUNTERED 146.72		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE 24.0 ft		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)			
18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES		21. TOTAL CORE RECOVERY %	
		DISTURBED		UNDISTURBED	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC		METALS	
		NA		NA	
22. DISPOSITION OF HOLE		BACKFILLED		MONITORING WELL	
LOCATION SKETCH/COMMENTS		SCALE: NA			
PROJECT RVAAP		A-7		HOLE NO. WB5mw-007	

DRILLING LOG

28

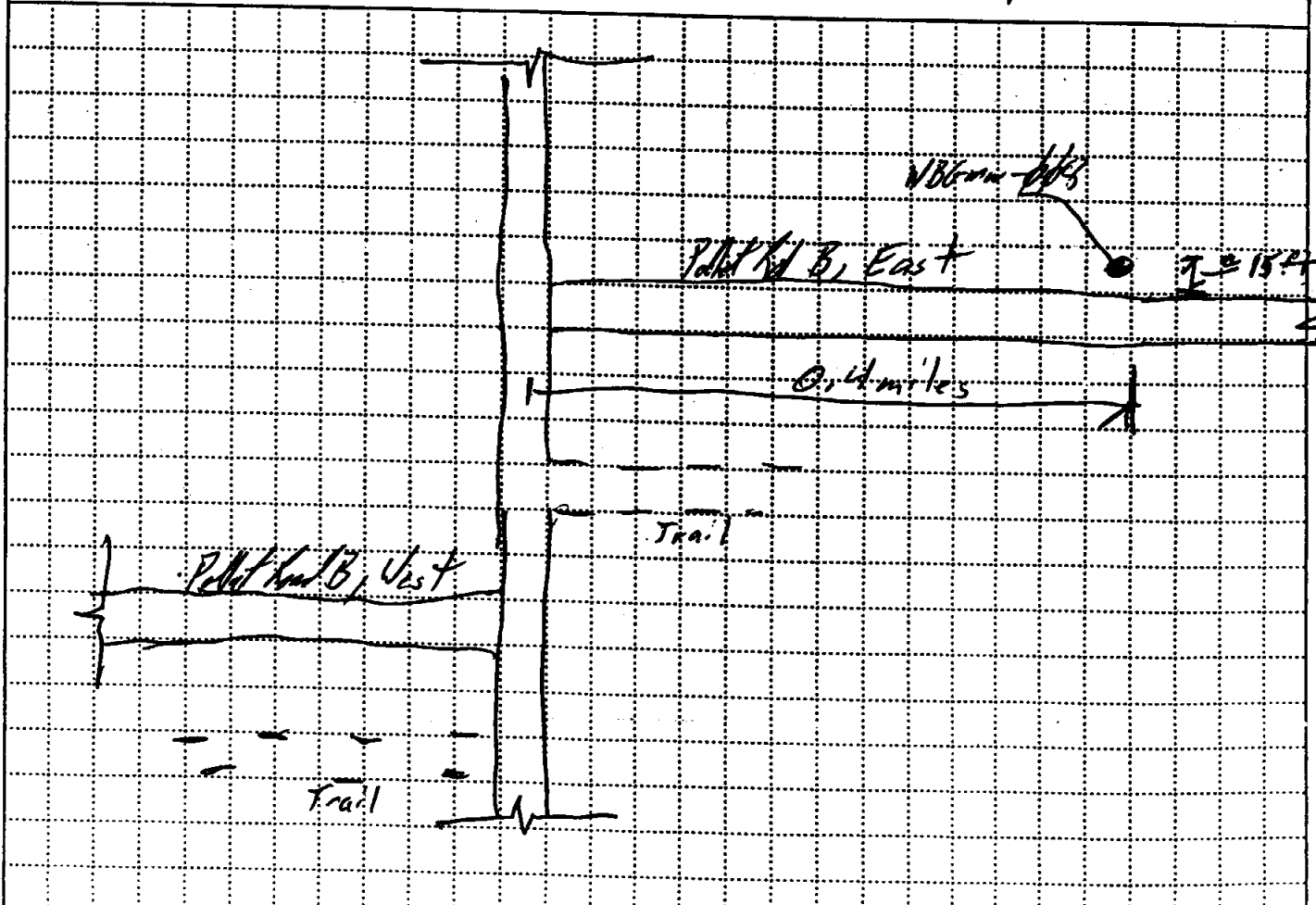
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
<div style="display: flex; justify-content: space-between;"> PROJECT: RVAAP INSPECTOR: Brad Baker HOLE NUMBER: N286 m w - 007 </div> <div style="display: flex; justify-content: flex-end;"> SHEET: 2 of 2 </div>						
	4	Silty CLAY; sand: granular ~15%, silt ~35%, clay ~50%; Yellowish Brown and variegated med gray clay; poorly sorted; subrounded; firm; moist; med plasticity (CL)	PID-011 LEL-02 O ₂ -212	NA	NA	0-4 ft run 3.0 ft recovery (75%)
	9	Silty CLAY; sand: fine ~10%; silt ~30%, clay 60%; Yellowish Brown and variegated bluish gray clay; poorly sorted; subrounded; firm; med plasticity; moist (CL)	PID-011 LEL-02 O ₂ -212	NA	NA	4-9 ft run 5.0 ft recovery (100%) cuttings v. moist
	9	Shelby Tube	PID-011 LEL-02 O ₂ -212	✓	NA	End of work day 23 Apr 96 24 Apr 96
	10.5	Silty CLAY; sand: granular ~10%, silt ~30%, clay ~60% Med yellowish Brown; poorly sorted; well rounded; soft; med plasticity; moist (CL)	PID-011 LEL-02 O ₂ -212	NA	NA	Tagged hole @ 9.0 ft bbs no H ₂ O detected 9-10.5 ft Shelby Tube
	14.0	SAME AS ABOVE w/ sandstone frags present	PID-011 LEL-02 O ₂ -212	NA	NA	10.5-14.0 ft run 0.5 ft recovery (15%) Intermittent rig chatter 16-17 ft bbs - granules 0.5 ft recovery (~10%)
	17.0	19-20.2 ft CLAY; sand-med ~15%, clay 45%; bluish gray; poorly sorted; subrounded; soft; high plasticity (fat clay); wet (CL) 20.2-20.8 ft SAND; granular ~10%, silt ~15%, coarse ~75%; med gray; subrounded; poorly sorted; soft/loose; no plasticity; saturated; (SW)	PID-011 LEL-02 O ₂ -212	NA	NA	At 20 ft bbs drilling became easier / softer 19-21 ft run Upon spoon retrieval free H ₂ O in sample 0947 tagged H ₂ O @ 18.72 ft bbs 0.5 ft recovery (90%) 1016 H ₂ O @ 18.72 ft bbs 1109 H ₂ O @ 18.72 ft bbs Tagged hole @ 20.7' bbs augers are open
	21	Sandy CLAY; sand: med-coarse ~36%; 10% sandstone frags; clay ~55%; med gray; sub-rounded; poorly sorted; soft; med plasticity; saturated (CL)				21-24 ft run 1.0 ft recovery (20%) 120' tagged @ 15.62 ft bbs (112%) 1130' H ₂ O @ 14.10 ft bbs 1205 H ₂ O tagged @ 13.76 ft bbs
	24					TD=24.0 ft bbs

A-8

HTRW DRILLING LOG		DISTRICT <i>Louisville Corps</i>		HOLE NUMBER <i>WBGmw-668</i>	
1. COMPANY NAME <i>SATIC</i>		2. DRILL SUBCONTRACTOR <i>Bowser Moyer</i>		SHEET SHEETS <i>1 OF 2</i>	
3. PROJECT <i>Phase I/EI @ Uicklopeck Basin Ground & Bedrock Survey</i>		4. LOCATION <i>RVAAP</i>			
5. NAME OF DRILLER <i>Magnus Lund</i>		6. MANUFACTURERS DESIGNATION OF DRILL <i>Falig F-7</i>			
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT <i>4 1/2" ID HSA 4" Continuous Split Barrel 15 ft long 3" Shelby Tube 2.5 ft long</i>		8. HOLE LOCATION <i>SE of WBG Pad #24</i>		9. SURFACE ELEVATION <i>1005.709</i>	
12. OVERBURDEN THICKNESS <i>NA</i>		10. DATE STARTED <i>23 Apr 98</i>		11. DATE COMPLETED <i>23 Apr 98</i>	
13. DEPTH DRILLED INTO ROCK <i>NA</i>		15. DEPTH GROUNDWATER ENCOUNTERED <i>11.66 ft b/s</i>		14. DEPTH TO WATER AND PLASSED TIME AFTER DRILLING COMPLETED	
14. TOTAL DEPTH OF HOLE <i>18.5 ft</i>		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)			
18. GEOTECHNICAL SAMPLES		DISTURBED		UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES <i>NA</i>		20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY %	
		VOC <i>NA</i>		METALS <i>NA</i>	
22. DISPOSITION OF HOLE <i>BACKFILLED</i>		MONITORING WELL		OTHER (SPECIFY)	
		<input checked="" type="checkbox"/>		23. SIGNATURE OF INSPECTOR <i>[Signature]</i>	

LOCATION SKETCH/COMMENTS

SCALE: *NA*



PROJECT <i>RVAAP</i>	A-9	HOLE NO. <i>WBGmw-668</i>
-------------------------	-----	------------------------------

DRILLING LOG

PROJECT		INSPECTOR			HOLE NUMBER	
RVAAP		Brent Baker			VBC MW-008	
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Sandy Clayey SILT; silt ~ 45%, clay ~ 30%; sand: fine-med ~ 25%; Mod Yellowish Brown variegated reddish orange, tan, and H. gray; poorly sorted; subangular; med plasticity; firm-hard; moist, (ML)	PI 0.0 ppm LEL - 0% O ₂ - 21.0%	NA	NA	0-4 ft run lost shoe off split barrel drilled additional 1 ft to catch shoe for augers 3.4 ft recovered (85%) Shelby Tube 5-7.0 ft 18" penetration / recovered actual 5-6.5 ft
	4			NA	NA	Shoe recovered
	5		PI 0.0 ppm LEL - 0% O ₂ - 21.0%		NA	Shelby Tube 5-6.5 ft 100% recovery
	6.5		PI 0.0 ppm LEL - 0% O ₂ - 21.0%	NA	NA	6.5 ft. sig chatter r.k. frag
	9	SAME AS ABOVE (9.0-9.5 ft) 9.5-10.0 ft SAND; sand med ~ 80% silt ~ 20%; Mod Brown; med sorted; subangular; v. soft; wet (SM)	PI 0.0 ppm LEL - 0% O ₂ - 21.0%	NA	NA	6.5-9 ft run 0% recovery 9-12 ft run 1.0 ft recovery (37.3%)
	12	Shelby Tube			NA	Shelby Tube 12-13.5 ft 14.8 Tons of H ₂ O @ 11-66' b/s
	13.5	SAND; sand: med - 85%, silt - 15%, Mod Brown; med sorted; subangular, v. soft, subangular (SM) Note: Bottom of shoe soil change to bluish gray, sandy silt.	PI 0.0 ppm LEL - 0% O ₂ - 21.0%	NA	NA	13.5-18.5 ft run 1.3 ft recovery ~ 25% Saturated cuttings present while augers @ 17 ft b/s 15% H ₂ O tangent @ 14.18 ft b/s
	18.5	TD = 18.5				

A-10

PROJECT

RVAAP

N 562010.3490

E 2359700.5730

ELEV.

1045.709

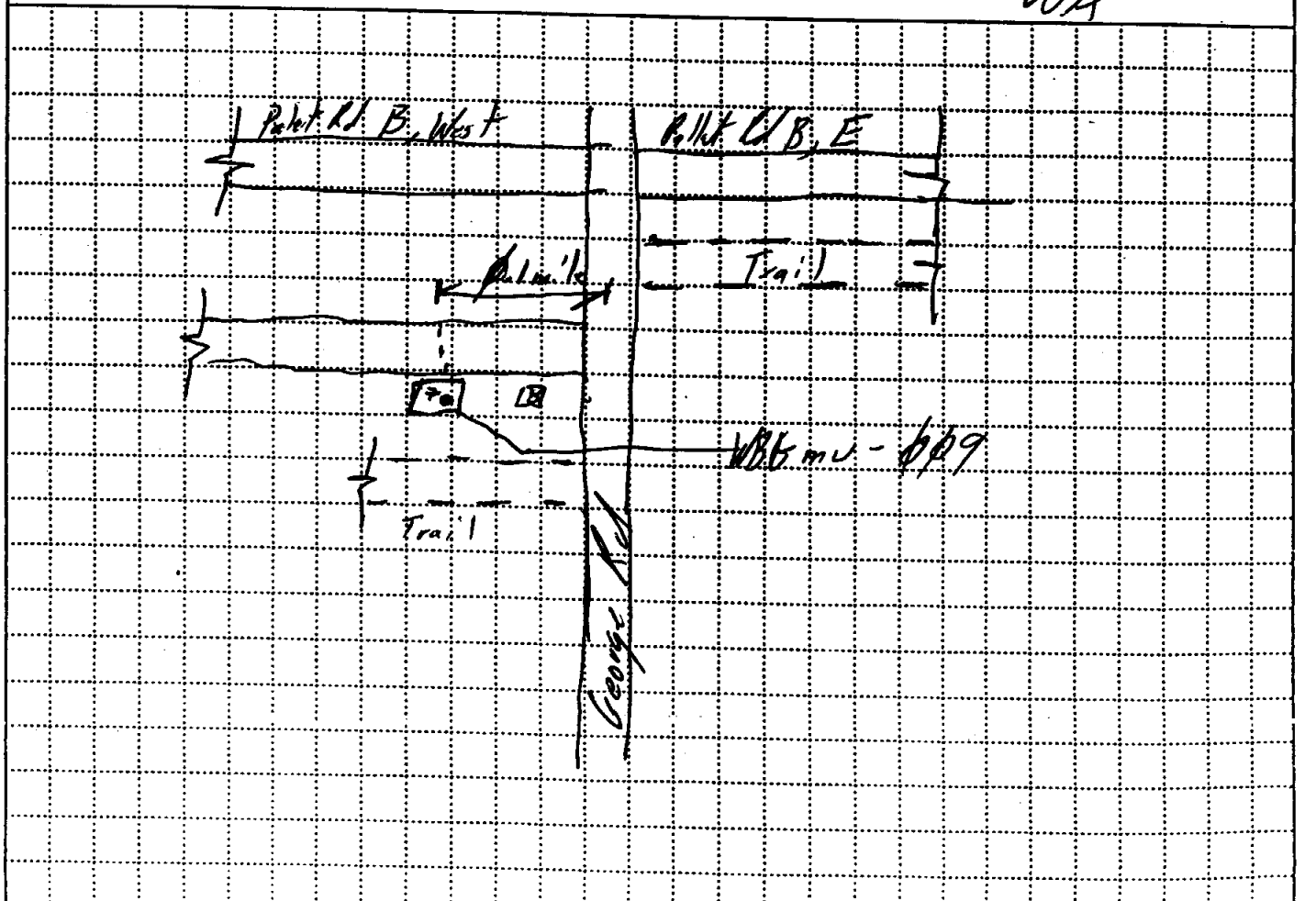
HOLE NO.

VBC MW-008

HTRW DRILLING LOG		INSTRCT <i>Louisville Corps</i>		WBG HOLE NUMBER <i>WBG MW 609</i>	
1. COMPANY NAME <i>SAFC</i>		2. DRILL SUBCONTRACTOR <i>Bowser Marge</i>		SHEET SHEETS <i>1 OF 2</i>	
3. PROJECT <i>Phase I RI @ Wiskipack Burning Ground Background Invest.</i>			4. LOCATION <i>RVAAP</i>		
5. NAME OF DRILLER <i>Maynard Lohrt</i>			6. MANUFACTURERS DESIGNATION OF DRILL <i>Failing F-7</i>		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT <i>4 1/2" ID HSA; 4 1/2" Continuous Split Barrel / 5 ft length; 3" Shallow Tube / 2.5 ft length</i>			8. HOLE LOCATION <i>SE of pad #7</i>		
12. OVERBURDEN THICKNESS <i>NA</i>			10. DATE STARTED <i>22 Apr 98</i>		
13. DEPTH DRILLED INTO ROCK <i>NA</i>			11. DATE COMPLETED <i>23 Apr 98</i>		
14. TOTAL DEPTH OF HOLE <i>24 ft</i>			15. DEPTH GROUNDWATER ENCOUNTERED <i>11.7 ft</i>		
18. GEOTECHNICAL SAMPLES			19. TOTAL NUMBER OF CORE BOXES <i>NA</i>		
20. SAMPLES FOR CHEMICAL ANALYSIS			21. TOTAL CORE RECOVERY %		
22. DISPOSITION OF HOLE			23. SIGNATURE OF INSPECTOR		

LOCATION SKETCH/COMMENTS

SCALE: *NA*



PROJECT <i>RVAAP</i>	A-11	HOLE NO. <i>WBG MW - 609</i>
-------------------------	------	---------------------------------

DRILLING LOG

PROJECT **RVAAP** INSPECTOR **Brian P. ...** W.D. # **1045-029** HOLE NUMBER **1045-029** SHEET **1 of 1**

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)	
	1	Sandy SILT; sand-fine-med ~25%, silt ~75%; Med yellowish brown; sub rounded; poorly sorted; hard; low-med plasticity; moist; ML.	LEL-0% O ₂ -21.3% PID-0ppm	NA	NA	0-4 ft run	
	2					lost shoe down hole; drilled additional 1 ft to 5.0 ft bbs and tripped out - shoe recovered	
	3					3.2 ft recovery / -65%	
	4						
	5	X					Drilled out to recover lost shoe
	6	Silty CLAY; silt ~30% clay ~60%, v. fine sand ~10%; Med Yellowish Brown; sub rounded; poorly sorted, soft; med plasticity; moist, Cl. Note: color w/ variegated lt gray	LEL-0% O ₂ -21.3% PID-0ppm	NA	NA	5-9 ft run	
	7					1.6 ft recovery / 30%	
	8						
	9						
	10	X					9-14 ft run
	11	X					0% recovery; probably pushed a ch. double;
	12	X					Cuttings appear same as 5-9 ft run w/ less moisture
	13	X					
	14	X					14-19 ft run
	15	X					Rtg chiller @ 14 ft
	16	X					0% recovery
	17	X					Cuttings appear same as above
	18	X					
	19	X					Shelly Tube 24-26 ft bbs No Recovery TD 22 Apr 98 - 19.0 ft 23 Apr 98 Borehole TD 24' bbs
		See Pg 45 for final core run					

PROJECT **RVAAP** N 561603.5350 E 2357159.2044 ELEV. 1045.029 HOLE NO. **1045-029**

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Phase II RI @ WBG and Background Investigation

DELIVERY ORDER NO: 0060

Date (mm/dd/yy): 04/22/96

Su M Tu W Th F Sa

PAGE 1 OF 2 ¹⁰ _{2 JMM}

Task Team Members:

Brad Baker

Gruber Cohen

Mark McCallers

Magna-Lohi

Narrative (include time and location):

~~1627~~ Set up @ WBG-609 location

1627 Begin drilling w/ 4 1/2" ID HSA, w/ continuous 5 ft length 1/4" split barrel

1900 Stop work TD - 19 ft bbs

[23 Apr 96] Tagged H₂O level @ 11.7 ft bbs; tagged inside augers @ 20.5 ft - augers open

0815 Resum'd drilling operations, kill switch tested & working

Run 19-24 ft bbs - saturated cuttings present

0832 Tagged H₂O @ 15.48 ft bbs

Run 19-24 ft / 1.6 ft recovery ~30% Sand SPT - sand: mud - coarse ~30%

silt ~70%; lt bluish gray; poorly sorted, subangular, v. soft; mud plasticity saturated; (MC)

0930 Drillers on site w/ well materials; tagged H₂O @ 11.1 ft bbs

Attempt shelly test: 24-26 ft bbs; no recovery saturated silt, penetrated 2 ft.

0946 Tagged base of hb @ 23.5 ft; began well installation

Received sand to 21.3 ft bbs

Measured well materials: 38' screen 10.03' Riser (2 segments) @ 10.03' each

Daily Weather Conditions: A.M. 23 Apr 96 Clear ~55°F

P.M. P. Cloudy, ~55°F

Recorded By Brad Baker

QA Checked By K. Demme

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BKG MW-006	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser-Morner		SHEET SHEETS 1 OF 7	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION Ravenna Arsenal		
5. NAME OF DRILLER John Filburn			6. MANUFACTURERS DESIGNATION OF DRILL Versa Sonic V-100		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 6" and 4" Rotasonic Core Barrels		8. HOLE LOCATION East of N. Perimeter rd / westward Nok hardware / alleyway Intersection into			
		9. SURFACE ELEVATION 1023.87 09-29-98 H2S			
		10. DATE STARTED 4-27-98		11. DATE COMPLETED 4-27-98	
12. OVERBURDEN THICKNESS 3.5'		15. DEPTH GROUNDWATER ENCOUNTERED into uncertain - in rock 25'-35'			
13. DEPTH DRILLED INTO ROCK 32'		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA			
14. TOTAL DEPTH OF HOLE 35.5'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 18' BGS, open BH before installing well.			
18. GEOTECHNICAL SAMPLES 1-2, 4-5		DISTURBED X	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES 3	
20. SAMPLES FOR CHEMICAL ANALYSIS 0-1', 1-3', 3-12'		VOC	METALS X	OTHER (SPECIFY)	OTHER (SPECIFY)
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL X	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
					23. SIGNATURE OF INSPECTOR Matt Polary
LOCATION SKETCH/COMMENTS			SCALE: None		
<p>The sketch shows a grid with a horizontal line representing 'N. Perimeter Road'. Below it, a dashed line indicates a distance of '0.6 mile' to a point labeled 'Westwood'. A vertical line represents an intersection with 'Westwood Rd'. A circle with a dot inside is located at the intersection, labeled 'BKG MW 006'. A curved line indicates the well's path from the intersection towards the top of the grid.</p>					
PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP				HOLE NO. BKG MW 006	

HTRW DRILLING LOG

HOLE NUMBER **B614 MW-006**

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR **M. DBLOY**

SHEET **A of 2**

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEO TECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		TOP SOIL; Dark gray silt, moist, loose , etc.				
	1	clayey silt (ML); Brown Moist; soft; low plasticity	0.0 PPM			
	2	Sandy gravel w/ silt, and clay (6W-6M); loose; moist; Brown				
	3					
	4	↓ increase clay content to clay and sand weathered SANDSTONE Mixed w/ clay/silt pale soil Top 6'.....				
	5	competent SS, Sharon Conglomerate TAN; very well sorted		5'-15' Core Box # Mw6-1		25'-33' Core Box # Mw6-3
	6	F. Sand, ^{sub} - sub r. Predom QUARTZ				
	7	Strong cementation 10-20% Medium Sand				
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16			15-25' Core Box # Mw6-2		
	17					
	18					
	19					
	20					
						BOB at 35'

A-15

HTRW DRILLING LOG		DISTRICT Louisville Corps			HOLE NUMBER BKSMW-004	
1 COMPANY NAME SAIC		2 DRILL SUBCONTRACTOR Bowser + Morner			SHEET 1 OF 2	
3 PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation				4 LOCATION Kavenna Arsenal		
5 NAME OF DRILLER John Filburn				6 MANUFACTURERS DESIGNATION OF DRILL versa-sonic V-100		
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" and 6" diam Rotar Sonic drilling core		8 HOLE LOCATION Smalley / Paris Windham				
		9 SURFACE ELEVATION 462.63 HGS 9-25-58				
		10. DATE STARTED 4-27-98		11. DATE COMPLETED 4-28-98		
12. OVERBURDEN THICKNESS ? > 50'		15. DEPTH GROUNDWATER ENCOUNTERED 10' in unconsolid.				
13. DEPTH DRILLED INTO ROCK NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 85' Down 6" casing				
14. TOTAL DEPTH OF HOLE 50', 19.5' Borehole well completed.		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA				
18. GEOTECHNICAL SAMPLES (2-3) (11-12')		DISTURBED X		UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES 1
20. SAMPLES FOR CHEMICAL ANALYSIS 0-1', 1-3', 3-12'		VOC X	METALS X	OTHER (SPECIFY) Exposures	OTHER (SPECIFY) SVOCs	OTHER (SPECIFY) Pests/CBS
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL X	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Mark Morner	
LOCATION SKETCH/COMMENTS				SCALE: None		
PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP				HOLE NO. BKSMW-004		

HTRW DRILLING LOG

HOLE NUMBER **386 MW 004**

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR **Mark DeJoy**

SHEET **2 of 3**

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Top 1' silty clay - SILTY CLAY; Brown; med. plasticity; Soft, moist	0.0 ppm			
	2					2-3 beated
	3	↓ slightly moist; stiff				
	4	→ more sand, less cohesive				
	5	Sandy clay (CL); Reddish Brown; Soft-Moist; medium plasticity				
	6					
	7					
	8					
	9					
	10	Sand (SP) reddish Brn F. sand S&X; moist-wet; loose				water @ 10' in SP
	11					
	12					
	13					
	14					
	15	↓ Brown 5-10% medium sand otherwise perfectly sorted trace F-gravel.				
	16					
	17					
	18					
	19					
	20					

A-17

HTRW DRILLING LOG

HOLE NUMBER
~~0154~~ MW014
 SHEET 3 of 3

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		(SP) cont'd	0.0 ppm			More silt content
	21	Predom. Quartz;				
		K-spar, mafics present				
	22	very similar to SS member				
		of Sharon Conglomerate				
	23	may be eroded/moss wasting				
		product of = Q _D				
	24	(Quaternary Alluvium)				Sand (SP): gray
		or drift				predom. f. sand; 10-20% M-C. sand and F-gravel wet; loose
	25					
	26					gray t. ill (M) ^{some silt} little clay _{zone; med} w/ gravel
	27					SAND cont'd; less sorting some silt
	28					Silty f. sand (SM); Brown; v.f.f sand AND silt; wet; on the cohesive side
	29					
	30					
	31					BOB @ 50'
	32					Backfill to 20'
	33					
	34					
	35	coarser sand zone 34.5-35 boulders				
	36	color change to gray				
	37	gradational contact Gravel (GP) gray 4" boulders Sub rounded; siltstone quartz pebbles				
	38	CLAY (CH); gray; moist; Firm; little silt; High plasticity				
	39	10% C. sand - F. gravel				

A-18

HTRW DRILLING LOG		DISTRICT Louisville Corps			HOLE NUMBER BK6 MW-12	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser Mornet			SHEET 1 OF 3	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation				4. LOCATION Ravenna Arsenal		
5. NAME OF DRILLER John Filburn				6. MANUFACTURERS DESIGNATION OF DRILL VERSA-Drill V-100		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" and 6" Rotasonic Core Barrels		8. HOLE LOCATION N. of Newton Falls / ^{Paris} Windan Road. N of Cobbs Pond				
		9. SURFACE ELEVATION 995.22				
		10. DATE STARTED 4/25/98		11. DATE COMPLETED 4-26-98		
12. OVERBURDEN THICKNESS 7'		15. DEPTH GROUNDWATER ENCOUNTERED uncertain but in shale Bedrock				
13. DEPTH DRILLED INTO ROCK 7'		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 8' BGS in open bit after cleaning overnight 4/25				
14. TOTAL DEPTH OF HOLE 60'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA				
18. GEOTECHNICAL SAMPLES		DISTURBED <input checked="" type="checkbox"/>	UNDISTURBED		19. TOTAL NUMBER OF CORE BOXES 4	
20. SAMPLES FOR CHEMICAL ANALYSIS CEC		VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR Matt Orling	
LOCATION SKETCH/COMMENTS				SCALE: None		
<p>The sketch shows a grid with a vertical line labeled 'Paris Windham Road' and a horizontal line labeled 'Ravenna Road'. A circle with a dot is labeled 'BK6 MW-12' and is located 0.17 mile north of Ravenna Road. A large irregular shape is labeled 'Cobbs pond' with an 'X' inside. There are also 'X' marks in the bottom right area of the grid.</p>						
PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP					HOLE NO. MW-12	

HTRW DRILLING LOG

HOLE NUMBER
 MW-12
 SHEET
 2 of 3

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Top Soil silty sand (SM); v. dk grayish brown; silt and predom. f. sand moist; loose; roots ↓ some gravel	Open			
	2	clay and silt (CL); yell. brn firm; slightly moist; low plasticity			(2-3) BK0828 600	
	3	moist, soft, geotech collected med. plasticity				
	4					
	5	Hard dry silt / f. sand (ML) yell. brn w/ Fe staining				
	6					Very Hard Drilling 5'-15'
	7	Layering Apparent Moist dk gray silt w/ small lt brown f. sand stringers				
	8	Extremely weathered shale / limestone Sharon Shale (?)				
	9					
	10	10:40 collect 5' core				
	11					core down to 17' switch bits on land core
	12					
	13					
	14	shale; black or dk gray coming up in powder and competent pieces; maybe being broken up by Rtg. Action				
	15					
	16					
	17	Black shale ↓				
	18					
	19					
	20					

A-20

HTRW DRILLING LOG

HOLE NUMBER *MB-12*

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR *W. J. ...*

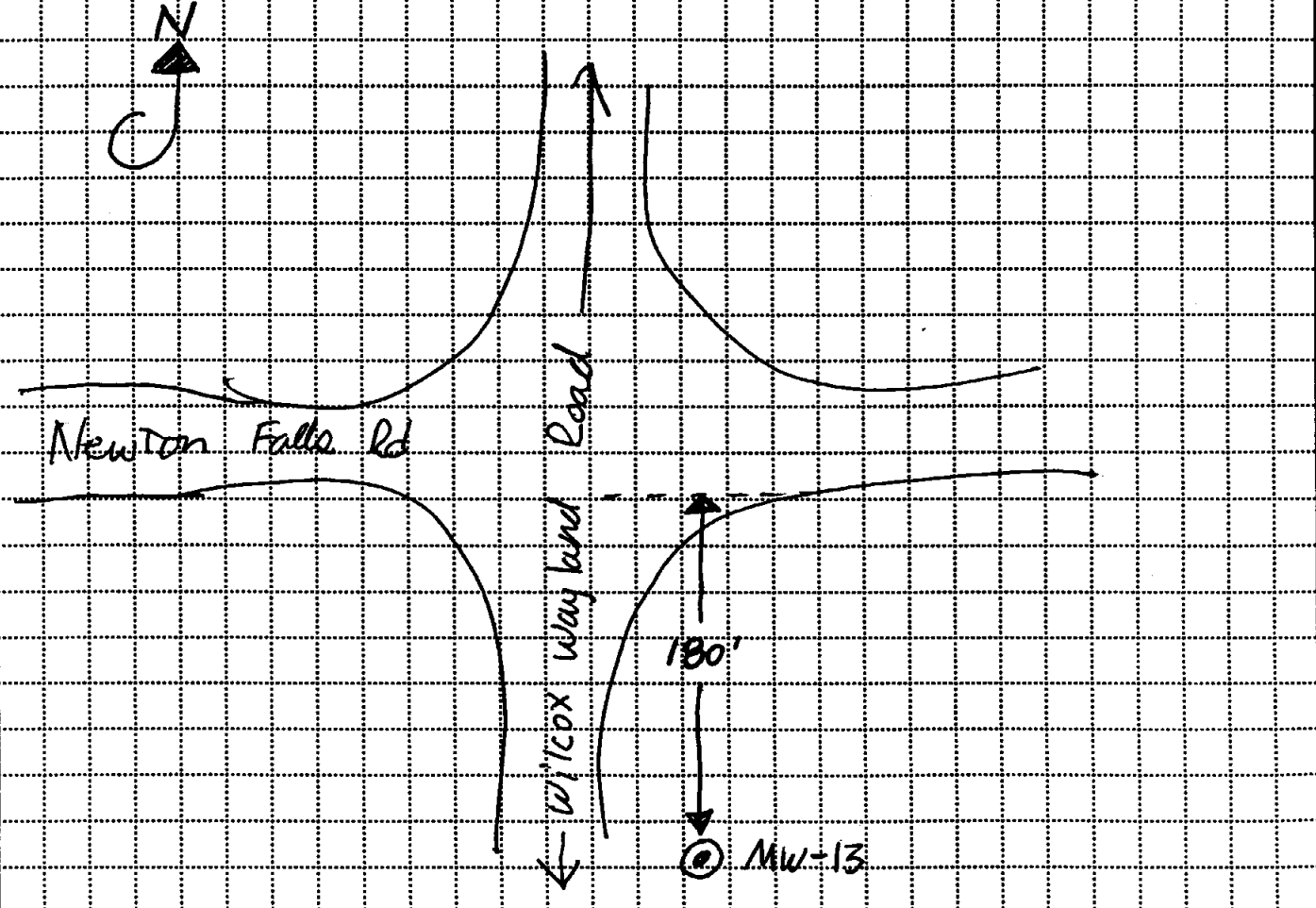
SHEET *3 of 3*

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	21	<i>OK gray shale cont'd</i>				
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	<i>A₁₀</i>		<i>A-21</i>			<i>Bob at 60'</i>

Dark gray but slightly lighter in color.

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER MW-13	
1 COMPANY NAME SAIC		2 DRILL SUBCONTRACTOR Bowser-Morner		SHEET 1 OF 2	
3 PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4 LOCATION Ravenne Arsenal		
5 NAME OF DRILLER John F. Burn			6 MANUFACTURERS DESIGNATION OF DRILL Versa-Drill V-100		
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" and 6" diameter Rotasonic Drill Cores.		8 HOLE LOCATION South of Newton Falls/Wilcox wayland Rds			
		9 SURFACE ELEVATION 984.38			
		10 DATE STARTED 4/24/98		11 DATE COMPLETED 4/25/98	
12 OVERBURDEN THICKNESS —		15 DEPTH GROUNDWATER ENCOUNTERED 19'			
13 DEPTH DRILLED INTO ROCK —		16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 9.5' BGS and 14 hours			
14 TOTAL DEPTH OF HOLE 25.5'		17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 12.2 from TOC			
18 GEOTECHNICAL SAMPLES (2-3) and (7-8)		DISTURBED X		UNDISTURBED	
19 TOTAL NUMBER OF CORE BOXES —		20 SAMPLES FOR CHEMICAL ANALYSIS 0-1', 1-3', 3-12'		21 TOTAL CORE RECOVERY % 100	
22 DISPOSITION OF HOLE well installed		BACKFILLED		MONITORING WELL X	
		OTHER (SPECIFY)		OTHER (SPECIFY)	
		OTHER (SPECIFY)		OTHER (SPECIFY)	
		OTHER (SPECIFY)		23 SIGNATURE OF INSPECTOR <i>[Signature]</i>	

LOCATION SKETCH/COMMENTS SCALE: **None**



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP	HOLE NO. MW-13
---	--------------------------

52

HTRW DRILLING LOG

HOLE NUMBER *MW 13*
SHEET *2 of 2*

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR

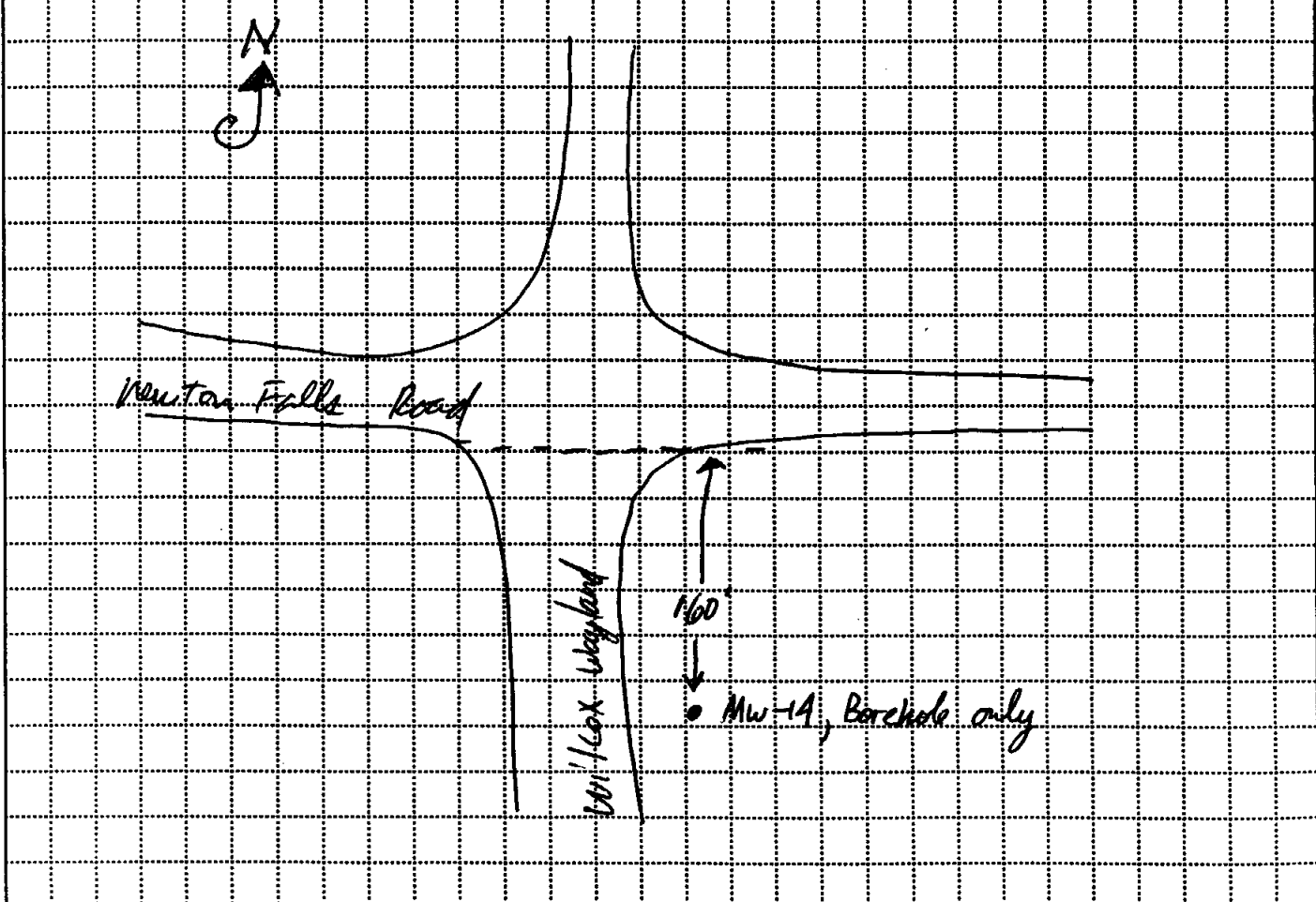
ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		<i>See MW-14 Log</i>				

A-23

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BK4-14	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser-Morner		SHEET SHEETS 1 OF 3	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION Ravenna Arsenal		
5. NAME OF DRILLER John Filburn			6. MANUFACTURERS DESIGNATION OF DRILL Versa-Sonic V-100		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" and 6" dia core barrels		8. HOLE LOCATION S. of Newton Falls / w/ Cox wayland Rd			
		9. SURFACE ELEVATION			
		10. DATE STARTED 04-24-98		11. DATE COMPLETED 4-24-98	
12. OVERBURDEN THICKNESS > 70'		15. DEPTH GROUNDWATER ENCOUNTERED 19.5' BGS			
13. DEPTH DRILLED INTO ROCK		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED			
14. TOTAL DEPTH OF HOLE 70'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 9' BGS, water Confined			
18. GEOTECHNICAL SAMPLES (2-3) (7-8) FT BGS		DISTURBED X	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES	
20. SAMPLES FOR CHEMICAL ANALYSIS 0-1', 1-3', 3-12'		VOC	METALS X	OTHER (SPECIFY) Explosives	OTHER (SPECIFY)
22. DISPOSITION OF HOLE Grout		BACKFILLED	MONITORING WELL	23. SIGNATURE OF INSPECTOR Mark Olson	
21. TOTAL CORE RECOVERY %					

LOCATION SKETCH/COMMENTS

SCALE: **not**



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP	HOLE NO.
---	----------

HTRW DRILLING LOG

(BKG MIN-014/13)
 HOLE NUMBER
 Bkg min 014 / 13
 SHEET 2 of 3

63

PROJECT Phase II RI at WBG and Background Investigation INSPECTOR *Mate O'Leary*

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEO TECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0.5	Silty clay (CL); Brown; low-mud plasticity; Moist STIFF (2-5) Soft (0-2) Little F. Sand.	0.0 ppm			
	1					CLAY (CU): Gray, sl. Brown, little silt, F. Sand. Moist, Firm-stiff. Higher plasticity - Medium.
	2					BK6 014 (2-3)
	3	3-5 slightly moist				
	4					
	5					↑ Increase Moist Content Firm
	5.5					Water table at 19.5'
	6					Sand, some gravel (SW) F.M. Sand & sub 4 some F-L gravel; WET little fine; dark gray
	7	Almost dry, crumbly				
	8					(GW) coarse gravel Subst. Subr. gravel wet some F-L sand
	9					
	10					SILT (ML): gray soft-firm, moist-saturated
	10					BK6014 3-12 + geotech (7-8)

30

HTRW DRILLING LOG

(BKG MW 014/13)
 HOLE NUMBER
 BKG MW 014/13
 SHEET 3-3

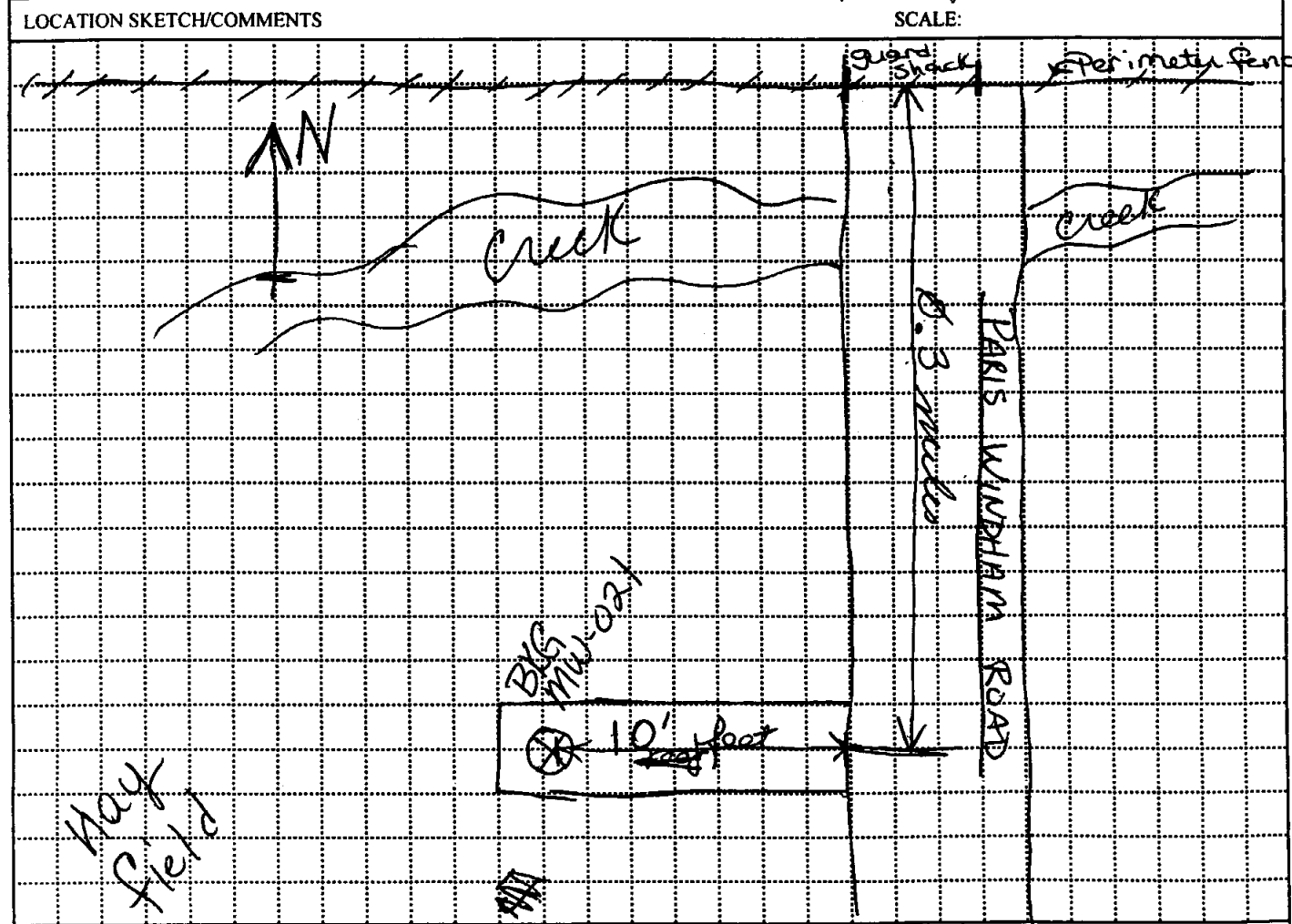
6A

PROJECT Phase II RI at WBG and Background Investigation INSPECTOR

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		SILT, cont'd sand(sp); grayish Brn F. Sand LITHOM. sand; MOIST (30-31)				13:45 collect 50-60' core
	31					
	32					
	33					
	34					
	35					
	36					SILT and clay mod plasticity low
	37					
	38					
	39	Little - some clay Clayey SILT				
	40					1A30 collect 60-70' core
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					less clay more sand and moist
	50		A-26			BOB @ 70'

51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BKGMW-021	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser Morner		SHEET 1 SHEETS OF 2	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION Hay field at Ravenna		
5. NAME OF DRILLER Maynard Lahti			6. MANUFACTURERS DESIGNATION OF DRILL Failing F7		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 6" Agar		8. HOLE LOCATION N pt of site - edge of hay field		9. SURFACE ELEVATION 969.71	
12. OVERBURDEN THICKNESS >19'		15. DEPTH GROUNDWATER ENCOUNTERED NA ~ 11' GWS		11. DATE COMPLETED 5-8-98	
13. DEPTH DRILLED INTO ROCK N/A		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED NA		10. DATE STARTED 5-8-98	
14. TOTAL DEPTH OF HOLE 19'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 17.22' @ 1045 5-8-98			
18. GEOTECHNICAL SAMPLES		DISTURBED X	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES NA	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC	METALS	OTHER (SPECIFY) Explosives	OTHER (SPECIFY)
0-1', 1-3', 3-12'			X		
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL	23. SIGNATURE OF INSPECTOR Deborah Smith	



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP		HOLE NO. BKGMW-021	
---	--	------------------------------	--

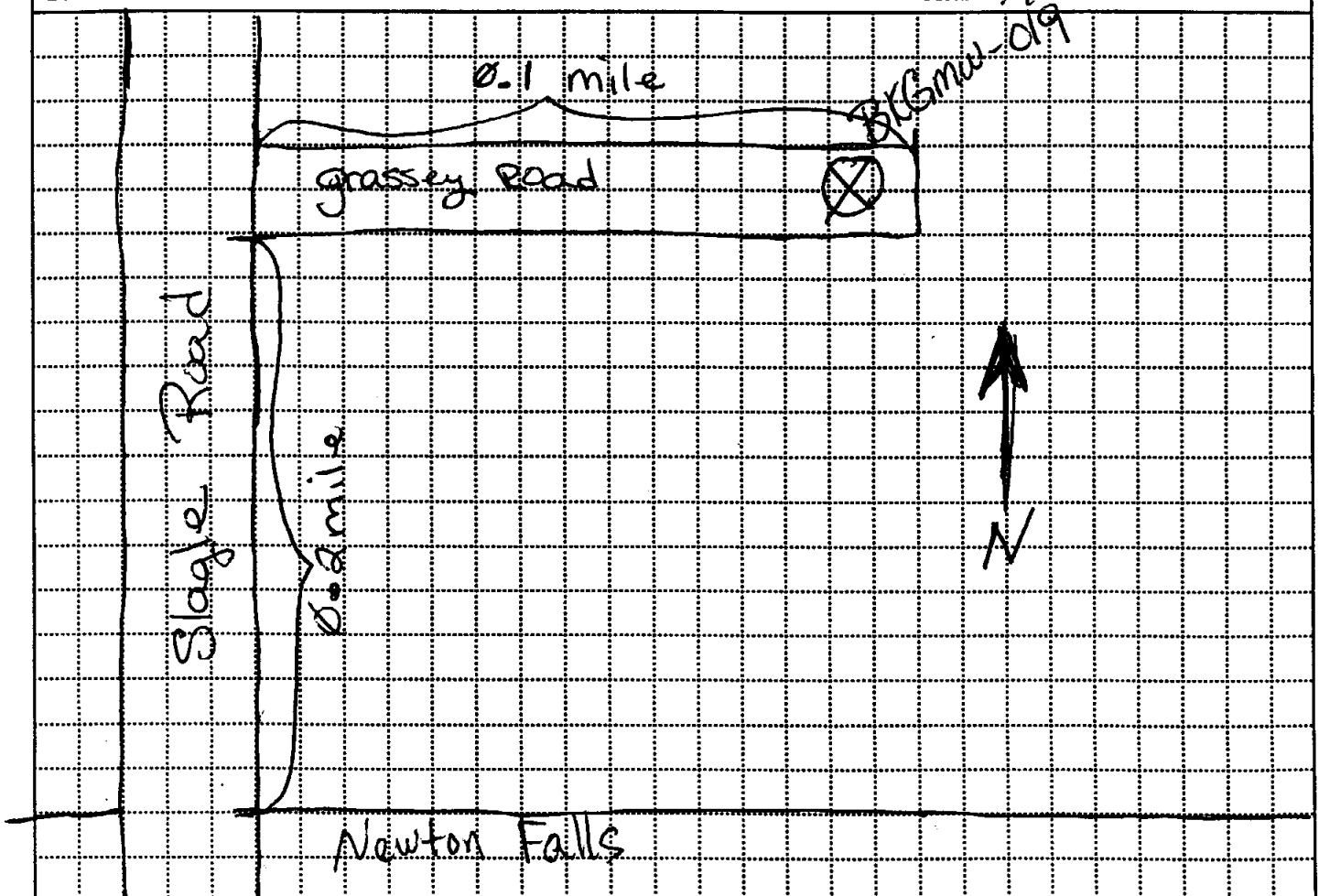
HTRW DRILLING LOG				HOLE NUMBER BKGMW-021		
PROJECT Phase II RI at WBG and Background Investigation			INSPECTOR Heather Smith		SHEET 2 of 2	
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEO TECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	0	Clayey silt, 25% clay Hard (ML) 70% silt Med. yellowish brown w/ ~ 5% fine sand "wisp" of lt. grey medium plasticity Moist Poorly sorted	0% CL 0 PID 20.7 OZ		BK0822 @ 1'-3'	Blow count for 1'-3' interval = 9, 12, 14 0 recovery - sticking in shoe stopped at 1 ft and resampled 50% recovery 3-4' split - year blows 18-25 ~ 50% recovery
	4	Slight color change to light yellowish brown @ 4' Core displays fissile characteristics Other characteristics are same as above (till)		2 Geotech samples taken from 6'-7' and 9'-10'	BK0823 @ 5'-6'	4' → 9' run = ~100% recovery 9' → 12' run = ~40% recovery - hit sand @ ~10', the sand did not recover well
	10	(SP) Poorly graded sand with silt med. grained sand Subangular moderately well sorted sand unit very soft 30-35% silt 65% sand - 70%	0% CL 0 PID 20.7 OZ	Geotech samples from 6'-7' and from 9'-10' H.S. 5-8-98	N/A	
	12	Shelby tube appears to be sand on both ends.	0% CL 0 PID 20.7 OZ	Shelby tube 12'-14'	N/A	Shelby tube from 12' → 14' - 3' of water evident on drill string upon Shelby tube removal 100% recovery appears to be sand on both ends
	14	Same sand as above Poorly graded sand w/ silt (SP) med. subangular grains 35% silt ~ 65% sand. Moderately sorted very soft				Wet cuttings @ 14' Saturated cuttings @ ~18' Soft drilling to 18' then "stiffened up" drill string wet - 3 1/2" from bottom upon removal from hole @ TD - 19' water level at 17.22'
	18	Sandy clayey silt H. brownish yellow w/ H. grey variegations 25% sand 25% clay 50% silt (ML)				at ~18' drilled into firmer clay
	19	bottom of hole = 19'		A-28		

11' 5"

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BKGmw-019	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser Morner		SHEET SHEETS 1 OF 2	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP off Slagle Rd.		
5. NAME OF DRILLER Maynerd Lahti			6. MANUFACTURERS DESIGNATION OF DRILL Fauling F7		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT			8. HOLE LOCATION Slagle Rd. RVAAP		
4 1/4" I.D. hollow stem auger 2" dia 2' length Split Spoon 4" dia 5' length Split barrel 3" dia 2 1/2' length Shelby tubes			9. SURFACE ELEVATION 1105.85		
12. OVERBURDEN THICKNESS 734			10. DATE STARTED 5-7-98		
13. DEPTH DRILLED INTO ROCK NA			11. DATE COMPLETED 5-7-98		
14. TOTAL DEPTH OF HOLE 341			15. DEPTH GROUNDWATER ENCOUNTERED 28' bls		
18. GEOTECHNICAL SAMPLES			19. TOTAL NUMBER OF CORE BOXES		
		DISTURBED	UNDISTURBED X		
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)
0-1', 1-3', 3-12'			X	explosives	SVOC
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY ~70%
		X			23. SIGNATURE OF INSPECTOR Heather L Smith

LOCATION SKETCH/COMMENTS

SCALE: N/A



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP

HOLE NO.
BKGmw-019

HTRW DRILLING LOG

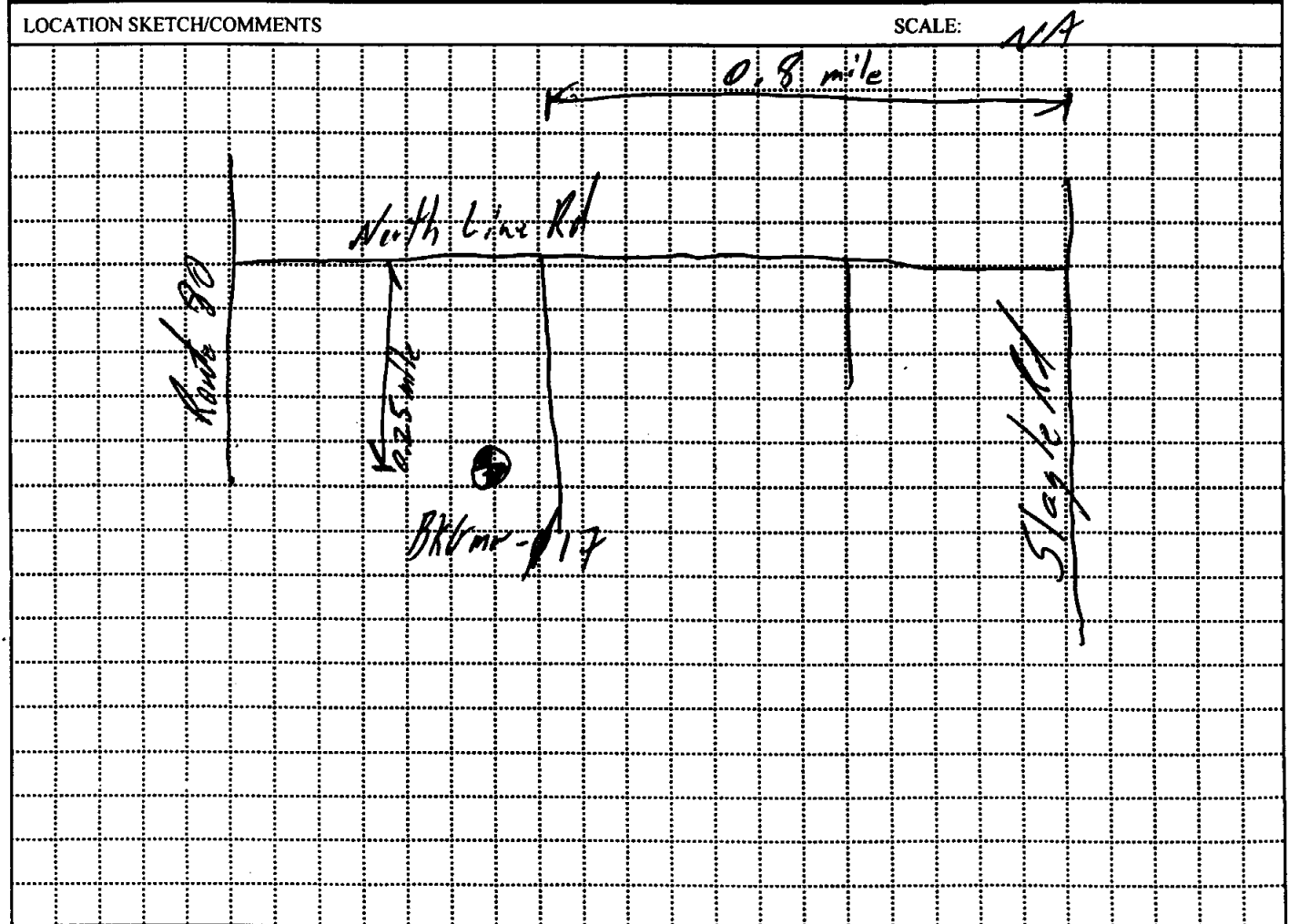
HOLE NUMBER
BKGmw-019
SHEET
2 of 2

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR
Heather Smith

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1'					4-5-7-10' blow count 1-3' 2" dia. 2' length Split spoon
	2'	Yellowish brown Clayey silt, clay ~30% Silt - 60% ~10% sand Yellowish brown w/ variegated Gray & reddish orange	0% LEL 20.6 Oz Ø PID		BK0808 0926 11-3'	60% recovery poorly sorted MS blow count 12-14 3' 4" int. 2" dia 2' length split spoon
	3'	poorly sorted low plasticity firm, moist coarse, subangular sand (ML)	↓		↓	
	4'	Same as above Some gravel become apparent @ 6 feet (~2.3%)				Blow Count 3-4' 12-14 2" dia S.S. 2' length Converted to 4" dia 5' length cont. Split barrel 4-9' run 4-9' run = 100% recovery
	8'	Silt, silt ~80% clay 10-15% gravel 3-5% poorly sorted firm to hard (ML) yellowish brown low plasticity subangular gravel	0% LEL 20.6 Oz Ø PID	grab sample @ 11'-12' 1004	BK0809 955 10-11'	9'-12' run = 100% recov.
	12'	Same as above with increase in gravel size to 1/2" - 2" at ~5-7% gravel	0% LEL 20.6 Oz Ø PID			Shelby tube sample attempted - resisted at 12.5' (only 0.5' recov) 14-19' run = 100% recov 19-24' run = 100% rec.
	14'	Same as above with sand interbed. from approx 25'-28' sand = subangular med. grained. moderately sorted 85% sand 15% silt no plasticity Very soft	0% LEL 20.6 Oz Ø PID	grab sample @ 27'-28' @ 1330		Saturated cuttings present w/ auger string at ~28' bls 24-29' run (recovery ~30%) drilling very soft from 25'-28' shelby tube attempt
	24'	grey silt sandy silt to fine grained sand silt 80-85%, sand 15-20% no plasticity	Ø LEL 20.6 Oz Ø PID			From 29-31 - upon retrieval 7' of drill string was wet no recovery refusal @ 28.3'
	29'	Silty, sandy, gravel silt 20% sand 60% gravel 20% (1/2" - 2" gravel) Yellowish brown Very soft Poorly sorted	Ø LEL 20.6 Oz Ø PID			
	30'					
	34'		A-30			ELEV. 1108.239

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BK6mw-017	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser Morner		SHEET 1 OF 1 SHEETS	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP (HWS 9-25-97)		
5. NAME OF DRILLER Myra d Labt:			6. MANUFACTURERS DESIGNATION OF DRILL Faling F-T		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		8. HOLE LOCATION N. Line Rd btwn R+80 & Sloge Rd			
2 1/2" ID Split Stem		9. SURFACE ELEVATION 1130.69 (HWS 9-25-97)			
4" ID Split Stem		10. DATE STARTED 6 May 98			
3" ID Split Stem		11. DATE COMPLETED 6 May 98			
3" ID Split Stem		12. OVERBURDEN THICKNESS Unknown			
3" ID Split Stem		13. DEPTH DRILLED INTO ROCK NA			
3" ID Split Stem		14. TOTAL DEPTH OF HOLE 34.8 ft			
3" ID Split Stem		15. DEPTH GROUNDWATER ENCOUNTERED Drilled depth 26 ft; H₂O rose to 19.16' (105 hr)			
3" ID Split Stem		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED			
3" ID Split Stem		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) (1205 hr) H₂O @ 13.2 ft			
3" ID Split Stem		18. GEOTECHNICAL SAMPLES		19. TOTAL NUMBER OF CORE BOXES	
3" ID Split Stem		DISTURBED NA		UNDISTURBED 1	
3" ID Split Stem		20. SAMPLES FOR CHEMICAL ANALYSIS		21. TOTAL CORE RECOVERY %	
3" ID Split Stem		VOC NA		METALS 1	
3" ID Split Stem		OTHER (SPECIFY) Semi-VOC		OTHER (SPECIFY) Explosives on	
3" ID Split Stem		22. DISPOSITION OF HOLE		23. SIGNATURE OF INSPECTOR	
3" ID Split Stem		BACKFILLED		MONITORING WELL	
3" ID Split Stem		OTHER (SPECIFY)		[Signature]	



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP	HOLE NO. BK6mw-017
---	------------------------------

HTRW DRILLING LOG

HOLE NUMBER BK6m-017

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR *Paul Baker*

SHEET 1 of 2

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Clayey SILT; silt ~ 60% clay ~ 25% v. fine sand ~ 15%; Lt yellowish Brown variegated; H gray; subrounded; poorly sorted; low plasticity; hard; moist (ML)	PID - 0 ppm LEL - 0% O ₂ - 20.9%	NA	BK 0826 (0918 hr)	1-3 ft collected w/ 2" x 1/2 ft length split from Blowland 11-16-24-28 100% recovery
	3	SAME AS ABOVE	PID - 0 ppm LEL - 0% O ₂ - 20.9%	NA		3-4 ft / 2 ft split; sandy blow count: 24-30
	4	SAME AS ABOVE	PIP - 0 ppm LEL - 0% O ₂ - 20.8%	NA	BK 0827 (7.5-8.5 ft) (0955)	converted to 4" x 1/2 ft length continuous split barrel 4-9 ft run 100% recovery
	9	Silty CLAY; clay 50%, silt 40% granules 10%; Med Brown; well rounded gravel present; poorly sorted; subrounded; low-med plasticity; hard; moist (CL)	PID - 0 ppm LEL - 0% O ₂ - 20.8%	NA		9-12 ft run 100% recovery
	12		PID - 0 ppm LEL - 0% O ₂ - 20.8%	✓	NA	Shelly Tube 12-14 ft 95% recovery (0.9 ft)
	14	CLAY; clay ~ 60%, v. fine sand ~ 15% granules/gravel ~ 5%; Bluish Gray; gravel v. well rounded; poorly sorted; subrounded; high plasticity; firm; moist (CL)	PID 0 ppm LEL - 0% O ₂ - 20.9%	NA	NA	14-19 ft run 100% recovery
	16.5	SAME AS 9-12 ft lithology	PIP - 0 ppm LEL - 0% O ₂ - 20.9%	NA	NA	
	19	CLAY; clay ~ 95%, v. fine sand ~ 10% 5% granules/gravel; Med greenish Gray; gravel - well rounded; poorly sorted; subrounded; high plasticity firm; moist (CL)	PID - 0 ppm LEL - 0% O ₂ - 20.8%	NA	NA	19-24 ft run 70% recovery Note 19.0-19.4 ft 19.0-19.4 ft wet core
	24	SAME AS ABOVE	PID - 0 ppm LEL - 0% O ₂ - 20.4%	NA	NA	24-29 ft run Bottom 3 ft of barrel - wet PID topped 14.10 ft bb (1956 hr) 3.5 ft recovery (70%) H ₂ O top @ 13.2 ft bb (2345 hr)
	28	SAND; fine-med ~ 80%, silt ~ 10%, gravel ~ 10%; Lt gray white; poorly sorted; subrounded; no plasticity; v. moist; moist (SP)	PID - 0 ppm LEL - 0% O ₂ - 20.8%	NA	NA	

HTRW DRILLING LOG

HOLE NUMBER BKGMW-017
SHEET 2 of 2

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR *Paul Behr*

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	29	SAND; sand. med ~ 85%, silt ~ 10%, gravel ~ 3%; Med brownish gray; thin interbed ~ 0.1 ft of well rounded granular sand; med sorted; subrounded; silt; moist	PID-011m LEL-0% OC-20.9%	NA	NA	29-34 ft run 70% recovery 3.5 ft
	34	(SP) Note: 31-32.0 ft sand zone is saturated TD = 34.0 ft				Note: Upon well installation borehole was tagged @ 34.8 ft b/s

A-33

PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation ELEV. N 562452.004 E 2346115.351 1132.799

HOLE NO BKGMW-017

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BK6mw-005	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR <i>Bowser Marine</i>		SHEET SHEETS 1 OF 2	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP <i>res 9-25-98</i>		
5. NAME OF DRILLER <i>Maunad Lahti</i>			6. MANUFACTURERS DESIGNATION OF DRILL <i>Pauling F-7</i>		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT			8. HOLE LOCATION NE of intersection of Rt 80 + N Line Rd.		
<i>9 1/2" ID HSA</i>			9. SURFACE ELEVATION 1049.69 <i>res 9-29-98</i>		
<i>2" ID 2 ft length split spoon</i>			10. DATE STARTED 4 May 98		
<i>3" ID 1 section 1/2" borehole, 5 ft length</i>			11. DATE COMPLETED 5 May 98		
<i>3" ID 2 1/2 ft length Shelby tube</i>			12. OVERBURDEN THICKNESS NA		
13. DEPTH DRILLED INTO ROCK NA			15. DEPTH GROUNDWATER ENCOUNTERED 10.0 ft		
14. TOTAL DEPTH OF HOLE 19.0 ft			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) <i>Prior to well installation 7.30 ft</i>		
18. GEOTECHNICAL SAMPLES		DISTURBED NA	UNDISTURBED <input checked="" type="checkbox"/>	19. TOTAL NUMBER OF CORE BOXES NA	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC NA	METALS /	OTHER (SPECIFY) <i>Explosives</i>	OTHER (SPECIFY) <i>Semi VOAs</i>
21. TOTAL CORE RECOVERY %		0-1', 1-3', 3-12'	22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL <input checked="" type="checkbox"/>
23. SIGNATURE OF INSPECTOR			<i>[Signature]</i>		
LOCATION SKETCH/COMMENTS					
SCALE: NA					
PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP				HOLE NO. BK6mw-005	

HTRW DRILLING LOG

LOG NUMBER
BKG mw - 005
SHEET
2 of 2

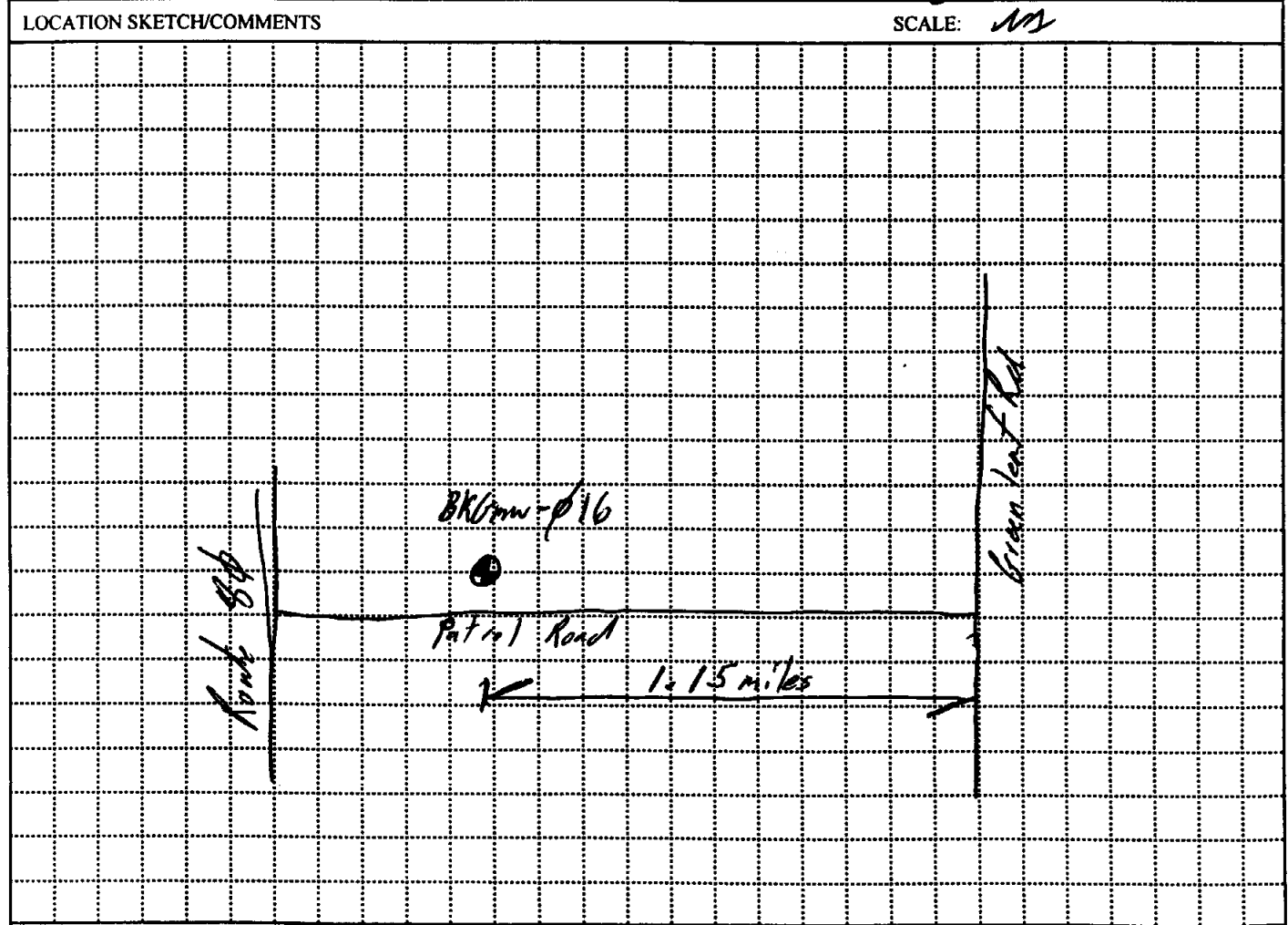
PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR
Brend Beck

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
						(1430hr)
	1	silt, SAND; sand: med ~ 50%, silt ~ 40%, granules ~ 10%; Med Yellowish Brown; sub rounded; poorly sorted; low plasticity; moist dense (SP)	PID - 0ppm LEL - 0% O ₂ - 20.8%	NA	BK 0814	7-3 ft Blow Count 8-9-9-14 Sample collected w/ 2" split 2 ft length split span 75% recovery
	2					
	3					
	4	SAME AS ABOVE	PID - 0ppm LEL - 0% O ₂ - 20.8%	NA		3-4 ft collected w/ 2" split span blows: 13-16 Converted to 4" split continuous split barrel 5 ft length (9-9 ft - 80% recovery) Wet cutting present @ 10 ft bls Saturated cutting present @ 11 ft bls.
	5	Water: 7-6 ft (1535 hr.) processed analytical sample			BK 0815 (7-8 ft) 4M NA	
	6					
	7	SAND; sand ~ 75%, silt ~ 15%, granules ~ 10%; Med Yellowish Brown; med sorted; sub rounded; soft, wet; non plastic; (SP) Int. banded sandy silt 9-11 ft	PID - 0ppm LEL - 0% O ₂ - 20.8%	NA	BK 0815 (7-8 ft)	Fogged H ₂ O @ 8.8 ft bls (1510 hrs) 3" Shelby Tube (25% recovery) collected 12-14 ft bls H ₂ O fogged @ 7.6 ft bls (1540 hrs)
	12	Water: 25% recovery Shelby Tube 12-14 ft bls	PID - 0ppm LEL - 0% O ₂ - 20.8%	✓	NA	(9-12 ft run, 100% recovery)
	14	SAND; sand: med ~ 70%, silt ~ 15%, granules 15%; Med Yellowish Brown; med sorted; sub rounded; soft; wet; non plastic (SP)	PID - 0ppm LEL - 0% O ₂ - 20.8%	NA	NA	1615 hr H ₂ O @ 7.30 ft bls 14-19 ft run 25% recovery
	19	TD = 19.0 ft bls				

A-35

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BK6mw-016	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Boyer Marine		SHEET 1 OF 2	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP		
5. NAME OF DRILLER Major / Capt.			6. MANUFACTURERS DESIGNATION OF DRILL Failing F-7		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4 1/2" ID HSA's 2" x 12 ft length split stem 4" x 15 ft length split stem 3" x 25 ft length Shelby Tube		8. HOLE LOCATION on Patrol Rd		9. SURFACE ELEVATION 1096.10	
12. OVERBURDEN THICKNESS NA		15. DEPTH GROUNDWATER ENCOUNTERED 10.0 ft b/s		11. DATE COMPLETED 5 May 98	
13. DEPTH DRILLED INTO ROCK NA		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED		10. DATE STARTED 5 May 96	
14. TOTAL DEPTH OF HOLE 19.0 ft			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) Drill hole @ 16 ft / 16-45 min H₂O @ 2.9 ft b/s		
18. GEOTECHNICAL SAMPLES		DISTURBED NA	UNDISTURBED NA	19. TOTAL NUMBER OF CORE BOXES NA	
20. SAMPLES FOR CHEMICAL ANALYSIS 0-1', 1-3', 3-12'		VOC NA	METALS NA	OTHER (SPECIFY) Explosives	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL	23. SIGNATURE OF INSPECTOR <i>[Signature]</i>	



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP	HOLE NO. BK6mw-016
---	------------------------------

HTRW DRILLING LOG

HOLE NUMBER
BK6mw-016
SHEET 202

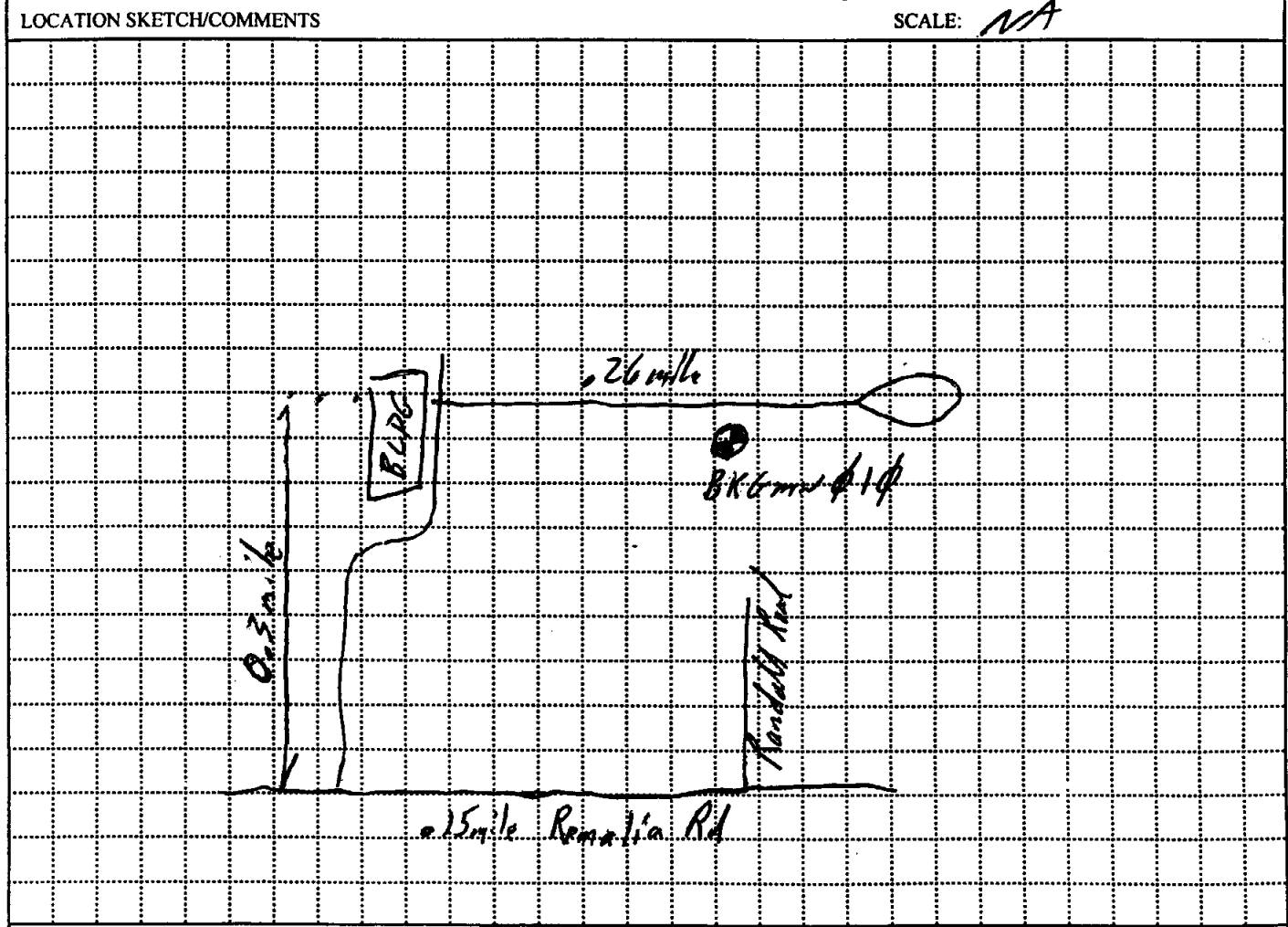
PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR
Brad Baker

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Clayey SILT; clay ~ 30%, silt ~ 60%, sand v. fine ~ 10%; Lt bluish Brown w/ variegated gray clay; poorly sorted; subrounded; med plasticity; firm; moist (ML)	PEP-0ppm LEL-0% O ₂ -20.4%	N/A	BK #818 1109 hrs	1-3 ft bbs Blows 6-7-9-12 Sample collected w/ 2" 2 ft length split spoon 80% recovery
	3	SAME AS ABOVE	PEP-0ppm LEL-0% O ₂ -20.4%	NA	NA	3-4 ft collected 1/2" 2" length split spoon; blows 15-18 - converted to 4" 5 ft length continuous split barrel - 4-9 ft run 95% recovery - 7 ft cuttings @ 7 ft bbs - Submerged with gas present @ 10 ft bbs - 9-12 ft run 100% recovery
	4.5	SAND; sand; coarse ~ 80%, granular ~ 10%, s. ft ~ 10%; Med Brown, subrounded; med sorted; no plasticity; soft; wet (SP)	PEP-0ppm LEL-0% O ₂ -20.3%	NA	BK #819 (1145 hrs) 8.5-9.0 ft	Shallow Tube 12-14 ft bbs 0% recovery - augered to 14 ft - Attempted Shallow Tube 14-16 ft bbs
	9.0	Clayey SILT; clay ~ 25%, silt ~ 75%; Lt Bluish Gray; poorly sorted; subrounded; high med-high plasticity; slightly firm; moist (MH)	PEP-0ppm LEL-0% O ₂ -20.8%	NA	NA	
	12.0	Shallow Tube - No recovery	PEP-0ppm LEL-0% O ₂ -20.4%	NA	NA	12-14 ft Shallow - 0% recovery granular sand
	14	Shallow Tube - 75% recovery	PEP-0ppm LEL-0% O ₂ -20.4%	✓	NA	14-16 ft Shallow Tube 75% recovery
	16	SAND; med-fine 45% silt ~ 15%; Med Gray; well sorted, subrounded; soft; no plasticity; wet (ST)	PEP-0ppm LEL-0% O ₂ -20.4%	NA	NA	1215 hr H ₂ O @ 14.20 ft bbs 1410 hr H ₂ O @ 2.80 ft bbs 16-19 ft run 33.3% recovery
	19	19 ft = TD				

A-37

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BKGM-010	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser Marac		SHEET 1 OF 2 SHEETS	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP		
5. NAME OF DRILLER Maguard Latt:			6. MANUFACTURERS DESIGNATION OF DRILL Failing F-7		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		8. HOLE LOCATION off Remelia Rd			
4 1/2" ID HSA		6" Tri-cone roller bit		9. SURFACE ELEVATION 1003.89	
2" Split Spm 12ft length		2" Core barrel 110ft length		10. DATE STARTED 28 Apr 98	
6 1/2" ID HSA		Ingr-soll-Rand 375 air compressor		11. DATE COMPLETED 4 May 98	
12. OVERBURDEN THICKNESS 4.0 ft			15. DEPTH GROUNDWATER ENCOUNTERED 12.0 ft bb		
13. DEPTH DRILLED INTO ROCK 16.0 ft			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED ND		
14. TOTAL DEPTH OF HOLE 22.0 ft			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 4 May 98 0900 hrs 10.1 ft bb		
18. GEOTECHNICAL SAMPLES		DISTURBED NA	UNDISTURBED NA	19. TOTAL NUMBER OF CORE BOXES 1 (15-20 ft run)	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)
0-1', 1-3', 3-12'		---	✓	Explosives	Semi VOA
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL	23. SIGNATURE OF INSPECTOR	
---		---	---	[Signature]	



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP	HOLE NO. BKGM-010
---	-----------------------------

HTRW DRILLING LOG


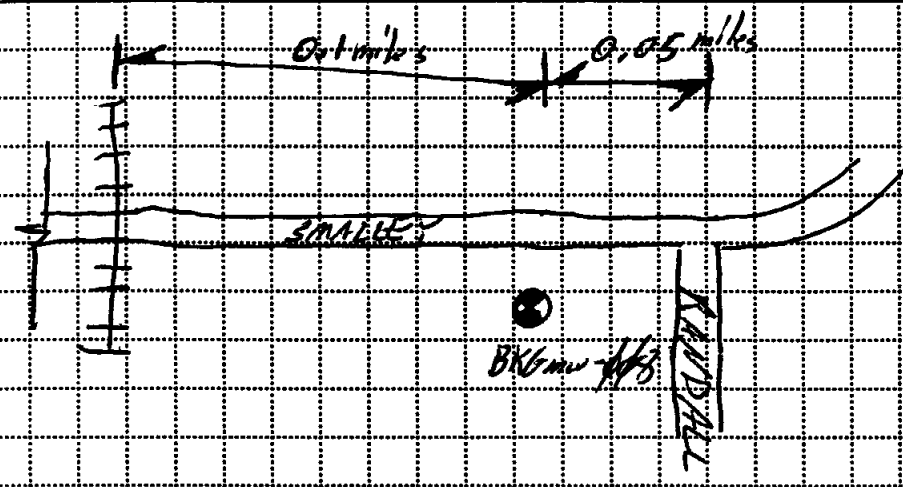
HOLE NUMBER
BKG MW-010
SHEET 2 of 2

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR *Red Lake*

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	1	Clayey SILT; clay = 40%, silt = 60% lt tan variegated med gray; poorly sorted; sub rounded; low plasticity; firm; moist; (ML)	PID 0ppm LEL 0% O ₂ - 20.5%	NA	BK0824 (1050 hr) 1-2 ft	0-1 ft - Large SS r/f frags present along w/ 1-3" type soils. Collected 1-3 ft, plus spec for lab analysis 1450 hr - 50% recovery (1 ft)
	3	Sandy SILT; sand = 30% and grain; clay = 20%, silt = 40% - granular ~ 10%; med yellowish brown; sub round; poorly sorted; low plasticity; firm; moist (ML)	PID 0ppm LEL 0% O ₂ - 20.5%	NA	BK0825 (1140 hr) 3-4 ft	3-4 ft collect w/ split barrel spec; 4" split barrel used from 4' - 29.9 ft 100% recovery. On r/f @ 4 ft -
	4		PID 0ppm LEL 0% O ₂ - 20.5%	NA	NA	Cuttings appear as though r/f is lt yellowish brown sandstone - however auger can cut the stone w/ rig change throughout auger advancement (4 1/2" ID HSA's). Cannot advance using inner split-barrel. To core in soft sandstone w/ little H ₂ O usage must keep will cause suction to gain up drill bit. Advanced auger to 15 ft h/s. very st. bearing v. hard / well cemented. (1200 hrs) converted to air rotary. 6 1/2" ID HSA's to 15 ft h/s (1500 hr).
15	15.0 - 16.7 ft	Sandstone; fine grained, well cemented; med yellowish brown hard	PID 0ppm LEL 0% O ₂ - 20.5%	NA		Subsided cuttings present w/ auger string @ 12 ft h/s. Note: Prior to reaming w/ 6 1/2" ID HSA's H ₂ O tagged @ 9.3 ft h/s (1425 hrs)
	16.7 - 17.2 ft	Shale; med gray, fissile; friable		Core Box #1	NA	
	17.2 - 18.0 ft	Sandstone; fine grained, well cemented; med yellowish brown, hard				Core 15.0 - 20.0 ft 100% recovery
	18.0 - 18.4 ft	Shale, med gray, fissile, friable				Reamed hole w/ 6" of tri-core roller bit.
	18.4 - 19.5 ft	Sandstone, fine grained, med cemented, lt gray, dense.				1720 Tagged bottom of reamed hole @ 20.0 ft h/s no H ₂ O detected.
	19.5 - 20.0 ft	Shale - med gray, fissile; friable.				4 May 98
22		TD = 22.0 ft				Upon cleaning hole tagged bottom @ 22.0 ft

A-39

HTRW DRILLING LOG		DISTRICT Louisville Corps			HOLE NUMBER BK6mw #8	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser Horner			SHEET 1 OF 2 SHEETS	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation				4. LOCATION RVAAP		
5. NAME OF DRILLER Magnoid Lohr;				6. MANUFACTURERS DESIGNATION OF DRILL Feiling F-7		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 2" ID NX Corbair		8. HOLE LOCATION SW of Smalley & Randall Intersection				
9. SURFACE ELEVATION 968.14		10. DATE STARTED 26 Apr 98		11. DATE COMPLETED 27 Apr 98		
12. OVERBURDEN THICKNESS 10 ft		15. DEPTH GROUNDWATER ENCOUNTERED 17 ft				
13. DEPTH DRILLED INTO ROCK 15 ft		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED				
14. TOTAL DEPTH OF HOLE 25.0 ft		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)				
18. GEOTECHNICAL SAMPLES		DISTURBED NA	UNDISTURBED NA	19. TOTAL NUMBER OF CORE BOXES NA		
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC NA	METALS ✓	OTHER (SPECIFY) SVQA's	OTHER (SPECIFY) Explosives	21. TOTAL CORE RECOVERY %
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR 	
LOCATION SKETCH/COMMENTS						SCALE: NA
						
PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP					HOLE NO. BK6mw-#8	

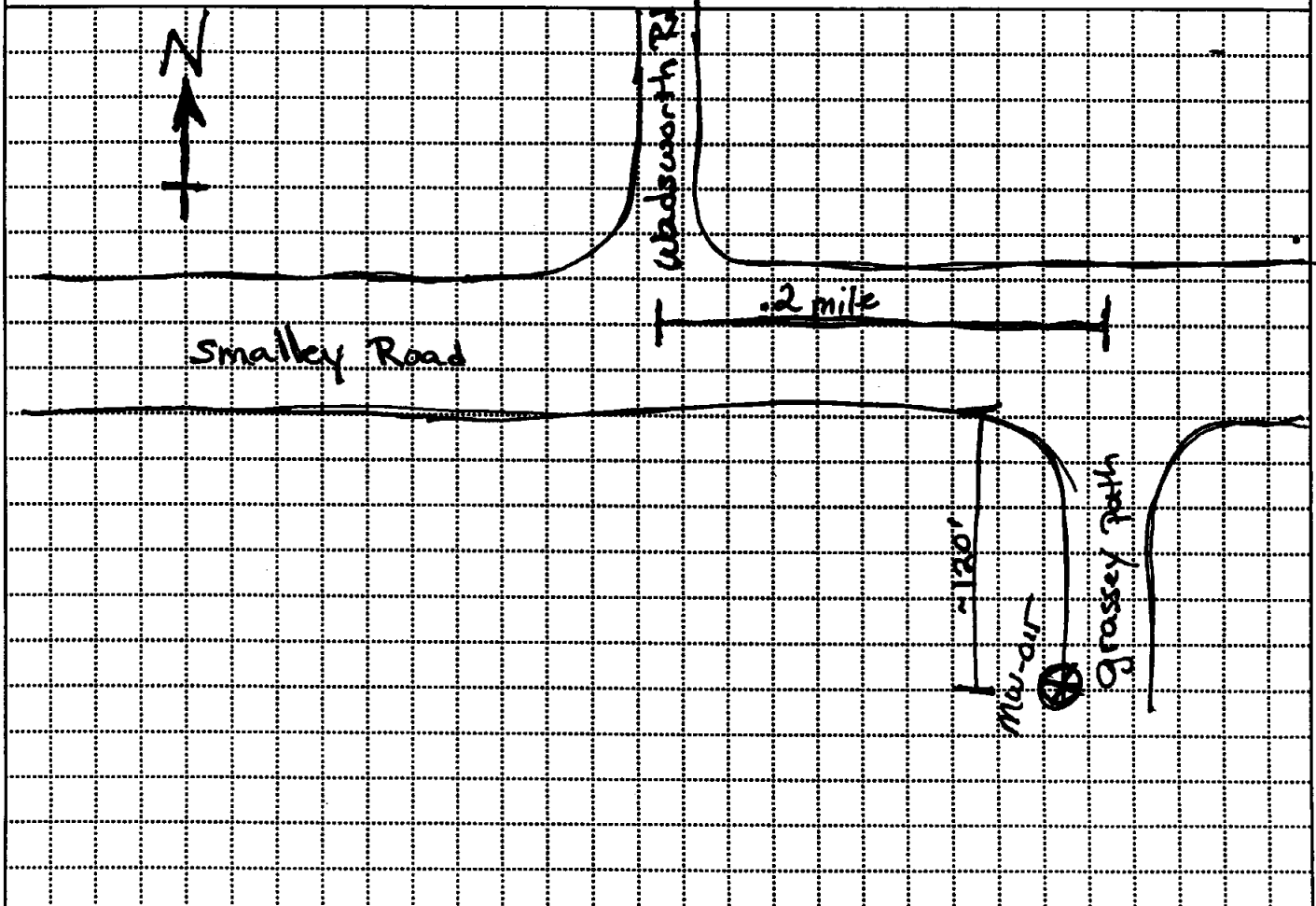
HTRW DRILLING LOG

PROJECT Phase II RI at WBG and Background Investigation		INSPECTOR <i>Brad Palmer</i>		HOLE NUMBER <i>BK 6 mw - 008</i>		
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Silty CLAY; sand: v. fine ~10%, silt ~30%, clay ~60%. Reddish Brown variegated mud	FFD-0ppm LEL-0%	NA	1-3 ft BK 0820 0925 hrs.	Attempted 1.0 ft bbs split from 2" ϕ from 1-3 ft bbs - 100% recovery 3-4 ft sampled above 2" ϕ split spm 100% recovery
	2	Gray; subrounded; poorly sorted mod plasticity; soft; moist (CL)	O ₂ -21%			
	3					
	4					
	5	Clayey silt; sand: v. fine ~10%, clay ~40% silt ~50%; Lt brownish yellow, w/ variegated gray clay; slightly fissile; hard; poorly sorted; subrounded; moist low plasticity (ML)	PFD-0ppm LEL-0% O ₂ -21%	NA	6-7 ft BK 0821 0920 hrs	4-10 ft sampled w/ 4" ϕ dual split barrels 4-9 ft run 100% recovery Attempted 9-12 ft run rock encountered @ 10 ft bbs 9-10 ft drilled 0.5 ft recovered, (50%)
	10	9-9.5 ft SAME AS ABOVE w/ large Dk Yellowish Brown Sandstone frag present.				
	18.5	(cuttings appear as Med Yellowish Brown Sandstone)	PFD-0ppm LEL-0% O ₂ -21%	NA	NA	(continued drilling r k w/ HSA's, used split barrel but no recovery 26 Apr 98 Competent / hard r k encountered @ 18.5 ft bbs. Subsided cuttings present @ 17 ft bbs. 0950 H ₂ O @ 18.2' bbs 1122 H ₂ O @ 16.5' bbs
	19.2	SANDSTONE; Med Yellowish Brown banded light gray; quartz sand & coarse w/ gradational changes ranging from fine to granular grain sizes, hard, mod-well siltic cementation; bedding ~105° from vertical; mod-low porosity; subangular; permeability: low-mid primary mod-high secondary, fractured and Fe-stained section @ 21.6-22.0 ft.	PFD-0ppm LEL-0% O ₂ -21%	NA Core Box #1	(0830 hrs)	27 Apr 98 H ₂ O topped @ 11.0 ft bbs TD hole soft frag @ 17.5' bbs Converting to 6 1/2" ID HSA to run hole to hard r k. Removal hole to 19 ft bbs. 1300 topped H ₂ O @ 10.10 ft bbs Coring from 19.2 ft to 25.0 ft bbs. @ 20.0 ft more H ₂ O present up hole and cuttings turned dk. gray. 1350 Coring complete @ 25.0 ft bbs
	25.0	TP = 25.0' bbs				

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BX6mw-015	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Bowser Morner		SHEET SHEETS 1 OF 3	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP		
5. NAME OF DRILLER John Filburn			6. MANUFACTURERS DESIGNATION OF DRILL VERSADRILL V100		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT		8. HOLE LOCATION S. of Smalley Rd ~ 120' (see map)			
4" & 6" diameter rotasonic drill cores 10' long, rock core barrel		9. SURFACE ELEVATION 1035.71			
2' long bit w/ Carbide Nubs		10. DATE STARTED 5-5-98		11. DATE COMPLETED 5-5-98 1700	
12. OVERBURDEN THICKNESS 10.5'		15. DEPTH GROUNDWATER ENCOUNTERED in shale around 30' BGS			
13. DEPTH DRILLED INTO ROCK 10.5'		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED w.l. @ ~30' BGS after overnight - 15 hrs			
14. TOTAL DEPTH OF HOLE 55'		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) NA			
18. GEOTECHNICAL SAMPLES 2-3' and 9-10'		DISTURBED X		UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES 2		20. SAMPLES FOR CHEMICAL ANALYSIS 2-3' and 9-10'		21. TOTAL CORE RECOVERY % 90	
22. DISPOSITION OF HOLE BACKFILLED		MONITORING WELL X		23. SIGNATURE OF INSPECTOR [Signature]	

LOCATION SKETCH/COMMENTS

SCALE:



PROJECT **Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP**

HOLE NO.

AW-15

HTRW DRILLING LOG

HOLE NUMBER **BK6 MW-15**

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR

SHEET **213**

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	1	Topsoil; DK gray; SILT w/ little clay; moist. Roots; organic matter; bits of brick			1-3' BK0874	
	2	Clay, some silt (CL); Brown; moist; soft; low plasticity				
	3	Sandy silt (silt); well B/A Dry; st. sh; some v.f. sand;				
	4	SILT; and little clay stratification apparent				
	5					
	6				0.0 PPM	25-35' Run coming out powdered and compressed into only ~ 2' of core for 10' Run, not suitable for putting into core box. shale very soft to be powdered and compressed like that.
	7					
	8					DARK GRAY SHALE Thinly Bedded, 1/4" or so
	9	7-10' collect geotech				
	10	Weathered shale Bedrock LT. gray and dry shale with silt/clay stringers very Hard.... cementation apparent w/in shale zones				
	11		10.8' BGS CONTACT w/ weathered shale			
	12					
	13					
	14	incompetent rock				
	15	DK gray shale: pulverized by rig unable to box up into core box				
	16	Thinly Bedded			35-45 Core Box # MW15-1	
	17					
	18					
	19					
	20		A-43			Cont'd on Pg 17

HTRW DRILLING LOG

HOLE NUMBER **BK6 MW-15**

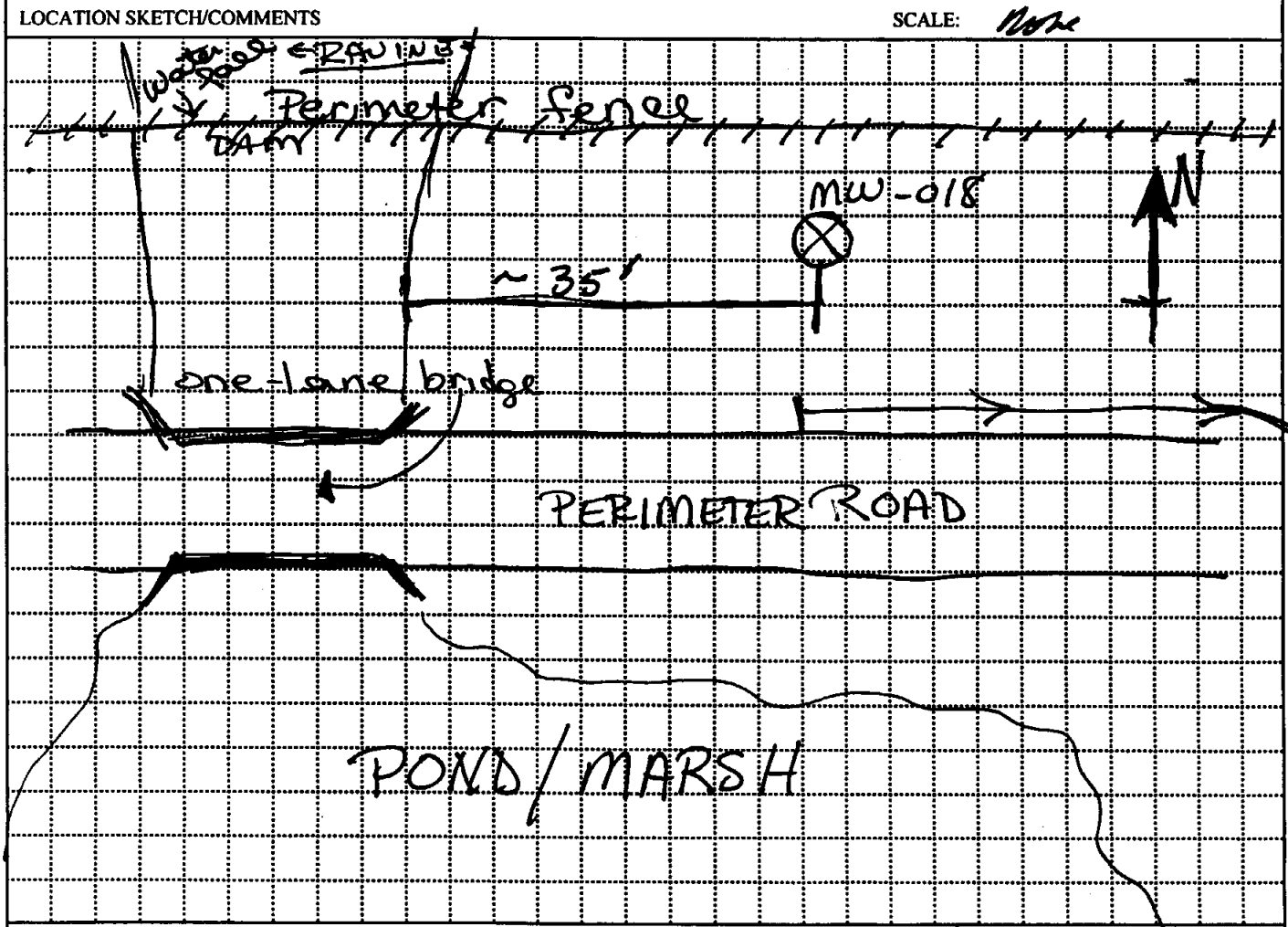
PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR **Matt O'Leary**

SHEET **3 of 3**

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	41					
	42					
	43					
	44					
	45	45-55' Run 12 minutes TO CORE SHALE, DK. gray Thinly Bedded.		45-55 Core Box # MW15-2		
	46					
	47					
	48					
	49					
	50	v.f. sand to silt siltstone lt. gray				
	51					
	52	↓ grading into ↓				
	53					
	54					
	55	@ 55' gray f.-grained SS w/ small interbeds of dk gray shale				
	56	BOB at 55'				
	57					
	58					
	59					
	60		A-44			

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER BKG MW-18	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR BOWSER-MORNER		SHEET SHEETS 1 OF 2	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP		
5. NAME OF DRILLER John F. Lburn			6. MANUFACTURERS DESIGNATION OF DRILL VERSA Drill-100 (V-100)		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" 6" ϕ Core barrels For Rotasonic's Rig, 10' long 2' long bit w/ Carbide subs.		8. HOLE LOCATION near Perimeter Fence on Shamons Rd		9. SURFACE ELEVATION 1040.82	
12. OVERBURDEN THICKNESS 3'		13. DEPTH DRILLED INTO ROCK 3'		14. TOTAL DEPTH OF HOLE 25'	
15. DEPTH GROUNDWATER ENCOUNTERED In Sandstone ~15' BGS based on equilibrium		16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 15' - one hour		17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	
18. GEOTECHNICAL SAMPLES 1-2' BGS		DISTURBED X		UNDISTURBED	
19. TOTAL NUMBER OF CORE BOXES 2		20. SAMPLES FOR CHEMICAL ANALYSIS 1-2' BGS		21. TOTAL CORE RECOVERY % 95%	
22. DISPOSITION OF HOLE BACKFILLED		METALS X		OTHER (SPECIFY) Explosives	
23. SIGNATURE OF INSPECTOR Mark O'Leary		OTHER (SPECIFY)		OTHER (SPECIFY)	



PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP	HOLE NO. BKG MW-18
--	-----------------------

HTRW DRILLING LOG

HOLE NUMBER **BK610W-018**

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR *Mark O...*

SHEET **2 of 2**

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		Topsoil DK gray SANDY SILT Roots, wood, etc	0.0 ppm			SANDSTONE cont'd Tannish gray in color
	1	SANDY SILT (ML): LT. Brown F-v.F Sand; moist; soft; maybe 5-10% clay				
	2	SANDY GRAVEL (low): F.C. Sand and F.C. Gravel to 3" sub \times - 4; LT. Brn; moist-wet; loose				
	3	Weathered Sandstone reddish Brn; v. well sorted				
	4		↓			
	5	SANDSTONE LT. Brown well sorted; Predom F. grain - M. grain		5-11.5 Core Box # MW18-1		5-15 core Only 5-11.5 lost Bottom 3.5' Drillers able to Recover another 2' at 5-13.5' Core Box # MW18-1
	6	Predom Quartz Reddish Brn streaks in top 10' of SS \times -Sub \times ; Horizontal Bedding; Thickly bedded				
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15			15-25 Core Box # MW18-2		
	16					
	17					
	18					
	19					
	20		A-46			

HTRW DRILLING LOG		DISTRICT Louisville Corps		HOLE NUMBER Bkg MW-20	
1. COMPANY NAME SAIC		2. DRILL SUBCONTRACTOR Poulsen - moran		SHEET SHEETS 1 OF 2	
3. PROJECT Phase II RI at Winklepeck Burning Ground and Background Investigation			4. LOCATION RVAAP		
5. NAME OF DRILLER John Filburn			6. MANUFACTURERS DESIGNATION OF DRILL VERA-Sonic V-100		
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT 4" and 6" ϕ , 10' long Sampling tubes, 2' long Carbide tipped bit, Municipal H ₂ O from Newton Falls		8. HOLE LOCATION N. of Newton Falls / George Rd Inter.		9. SURFACE ELEVATION 1062.68	
12. OVERBURDEN THICKNESS ~ 9'-10'			15. DEPTH GROUNDWATER ENCOUNTERED ~ 2'		
13. DEPTH DRILLED INTO ROCK 10'			16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED 5' Bbs after an 1.5 hr Recovery period		
14. TOTAL DEPTH OF HOLE 30'			17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)		
18. GEOTECHNICAL SAMPLES 1-2' and 3-4'		DISTURBED X	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES 2	
20. SAMPLES FOR CHEMICAL ANALYSIS		VOC	METALS X	OTHER (SPECIFY) Explosives	21. TOTAL CORE RECOVERY % 100
22. DISPOSITION OF HOLE		BACKFILLED	MONITORING WELL X	23. SIGNATURE OF INSPECTOR Matt [Signature]	
LOCATION SKETCH/COMMENTS				SCALE: None	
PROJECT Phase II RI at Winklepeck Burning Ground and Facility-wide Background Investigation, RVAAP				HOLE NO. MW-20	

HTRW DRILLING LOG

HOLE NUMBER

DK MW 20

PROJECT Phase II RI at WBG and Background Investigation

INSPECTOR

Matt Adams

SHEET

5A2

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G) Description of Mat.
	1	TOPSOIL: DK grayish Brn sandy silt; silt w/ F.C. P. sorted sand; 6"-10" some clay		0-5 core 100% recov.		
	2	SILTY CLAY (CL); Brown w/ Reddish Brn and brown mottling; moist; stiff-hard Medium plasticity	0.0 PPM	2' Geotech BK0810 → 1-2' + Geotech		Very fine sand / SILTY zone, lt-gray, 2 color
	3	NO MOTTLING Below 2'			BK0811 3-4' + Geotech	21-23 SANDY SILTSTONE lt. gray, has some horizontal cracks and cavities (solution?) NOT Real Thick or Extensive zone
	4	↓ HARD				20-30' CORE BOX # MW20-2
	5					
	6			5-15 core core retrieval @ 13' just too hard, core barrel overburden, w/out running H ₂ O		DARK gray SHALE
	7	SANDY CLAY zone maybe dry, crumbly, slightly moist 25% poorly sorted sand which includes F. gravel				
	8	SILTY CLAY cont'd Hard				
	9					
	10	very weathered DK gray shale w/ clay				Bob at 30'
	11					
	12					
	13	DK Gray SHALE Thinly bedded, horizontal bedding; trace carbon imprints of plant or small tree mat'ls.		13-20 core All DK gray shale CORE BOX # MW20-1		
	14					
	15					
	16					
	17					
	18					
	19					
	20					

A-48