APPENDIX D

MONITORING WELL INSTALLATION LOGS

Load Line 1 Phase II RI
Monitoring Well Installation Logs

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Monitoring Well Installation Logs

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HTRW DRILLING LOG

1 COMPANY NAME: SAIC	DISTRICT: Louisville	HOLE NUMBER: LLI-MW-78
2 DRILL SUBCONTRACTOR: Miller Drilling Co.		SHEET 1 OF 5 SHEETS

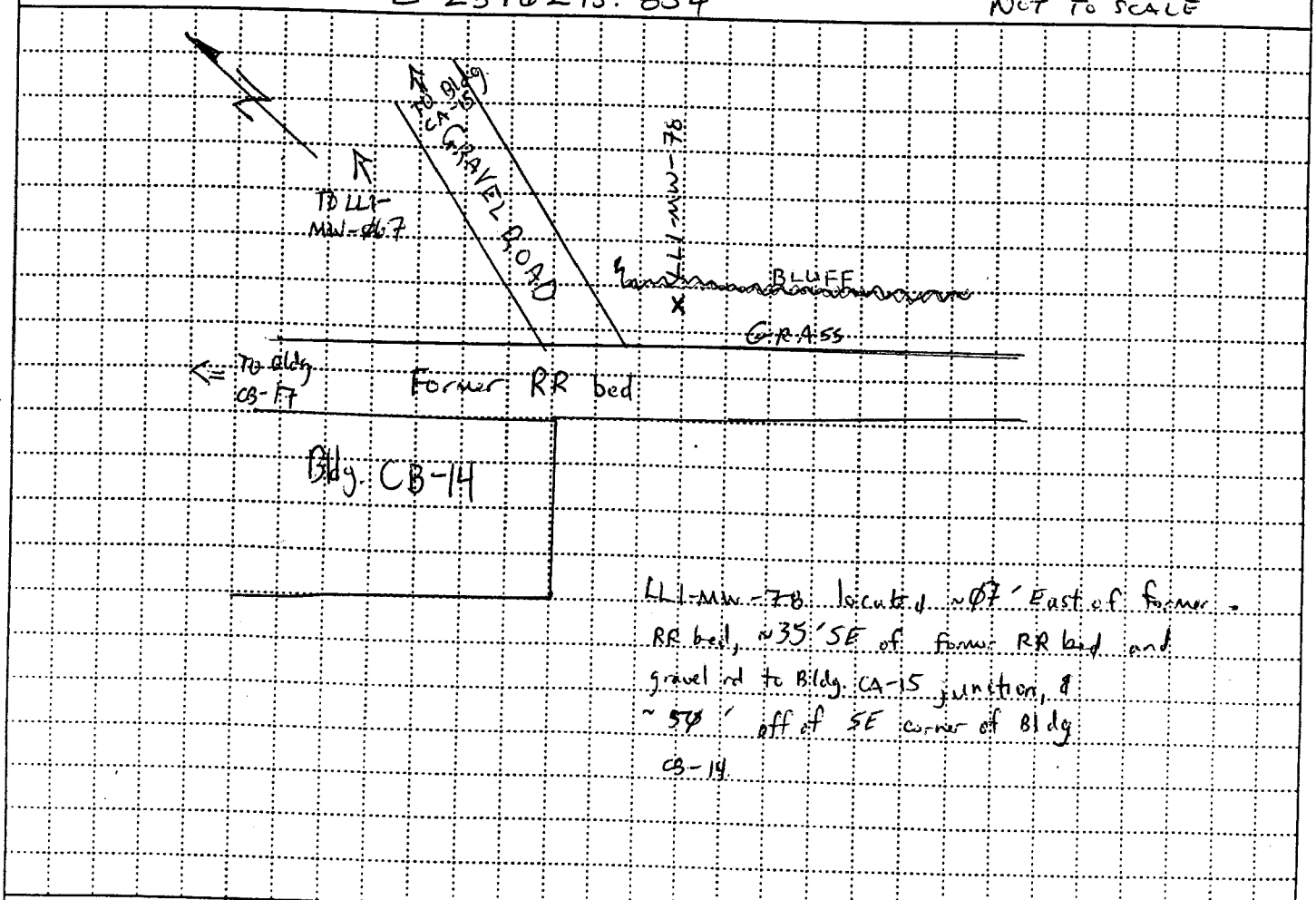
3 PROJECT: RVAAP, LLI, Phase II RI	4 LOCATION: RVAAP, LLI, Ravenna, Ohio.
5 NAME OF DRILLER: P. Brown	6 MANUFACTURERS DESIGNATION OF DRILL: CME-75
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 4¼" ID HSA, 2" split spoons, 3" Shelby Tube, 6" Tricone roller bit, Sullivan D375Q air compressor w/ oil/air separator	8 HOLE LOCATION: See Sketch Below
	9 SURFACE ELEVATION:
	10 DATE STARTED: ~~08/23/99~~ 08/24/99 WLO 9.9.02
	11 DATE COMPLETED: ~~08/25/99~~ 08/25/99 WLO 9.9.02
12 OVERBURDEN THICKNESS: Refusal @ 4' BGS	15 DEPTH GROUNDWATER ENCOUNTERED: Wet cutting & water in borehole @ ~34' BGS.
13 DEPTH DRILLED INTO ROCK: 39.6' ~~Spoon~~ WLO (From @ 4'- 40.0' BGS)	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 31.20' BGS after 15½ hrs.
14 TOTAL DEPTH OF HOLE: 40.0' BGS.	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
N/A	N/A	N/A	N/A

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY %
N/A	N/A	N/A	N/A	N/A	N/A	N/A

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
set monitoring well	N/A	2" PVC	N/A	Matthew B. Vest

LOCATION SKETCH/COMMENTS: N 564623.871, E 2376275.854 SCALE: NOT TO SCALE



LLI-MW-78 located ~67' East of former RR bed, ~35' SE of former RR bed and gravel rd to Bldg CA-15 junction, & ~50' off of SE corner of Bldg CB-14

PROJECT	HOLE NO
RVAAP, LLI, Phase II RI	LLI-MW-78

ENG FORM 5056-R, AUG 94 (Proponent CECW-EG)

DRILLING LOG

PROJECT: RVAAP, LLI, Phase II, RI | INSPECTOR: M. Vest | HOLE NUMBER: LLI-MW-78 | SHEET: 2 of 5

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)
		GRAVEL & Topsoil	Ø.Ø ppm	n/a	N/A	Could not drive/push split spoon/Shelby Tube past Ø.4' BGS. Auger refusal @ 1.Ø' BGS. Begin air rotary drilling @ 1.Ø' BGS. Driller says sandstone feels weathered when drilling it. Rock descriptions logged w/ cuttings from air rotary. Depths are not exact to 1/10 ft due to delay in some cuttings return. Air rotary advancing @ ~2' per 1Ø minutes until ~9.5' BGS. Then ~1' per 1Ø min.
		Ø.4'				
		Not Sampled				
	1.Ø	1.Ø'				
		Auger Refusal @ 1.Ø'				
		Sandstone, f-m. gr, 7/N light gray, dry.				
	2.Ø					
			Ø.Ø ppm	N/A	N/A	
	3.Ø					
	4.Ø					
	5.Ø		Ø.Ø ppm		N/A	
	6.Ø					
	7.Ø					
			Ø.Ø ppm	N/A	N/A	
	8.Ø					
		Shale, 4/10Y d. greenish gray. v. wea., dense, damp.				
	9.Ø					
		9.5'				
	10.Ø	Sandstone, f-m gr. 7/N lt. gray, dry.	Ø.Ø ppm		N/A	

DRILLING LOG

PROJECT: RVAAP, LLI, Phase II, RI | INSPECTOR: M. Vest | HOLE NUMBER: LLI-MW-78 | SHEET: 3 of 5

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)
	11.0	Sandstone, f-m gr., 7½ 1t. gray, dry.	0.0 ppm	N/A	N/A	Air rotary rate still @ ~1' per 10 minutes.
	12.0	— — — — — 12.0'				
		Sandstone, f-m gr, 2.5Y 6/2 lt brownish gray dry.	0.0 ppm	N/A	N/A	Driller says weathered drilling ended @ 12.0' BGS. Below this drilling feels as if rock is more competent. No change in cuttings.
	13.0					
	14.0					
	15.0		0.0 ppm	N/A	N/A	
	16.0					
	17.0					
			0.0 ppm	N/A	N/A	
	18.0					
	19.0					
	20.0		0.0 ppm	N/A	N/A	

PROJECT: RVA AP, LLI, Phase II, RI | HOLE NO: LLI-MW-78

DRILLING LOG

PROJECT: LL1, RVAAP, Phase II RI | INSPECTOR: M. Vest | HOLE NUMBER: LL1-MW-78 | SHEET 4 of 5

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)
		Sandstone, f-m gr, ~~fn, mgd gray, dry~~ unstss 2.5Y6/2 lt. brownish gray, dry.	0.0 ppm	N/A	N/A	Air rotary drilling rate ~1ft/10 min
	21.0					
	22.0					
			0.0 ppm	N/A	N/A	
	23.0					
	24.0					
	25.0		0.0 ppm		N/A	
	26.0					
	27.0					
			0.0 ppm	N/A	N/A	
	28.0					
	29.0					
	30.0		0.0 ppm		N/A	

PROJECT: RVAAP, LL1, Phase II RI | HOLE NO. LL1-MW-78

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DRILLING LOG

PROJECT: RVAAP, LLI, Phase II RI | INSPECTOR: M. Vest | HOLE NUMBER: LLI-MW-78 | SHEET: 5 of 5

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)
	31.9	Sandstone, f-m gr., ~~slightly~~ mag ~~light~~ ~~gray~~, dry, 2.5Y 6/2 lt. brownish gray.	0.0 ppm	N/A	N/A	
	32.9		0.0 ppm	N/A	N/A	Air rotary drilling rate ~ 1ft/10min.
	33.9					
	34.9	34.9	0.0 ppm	N/A	N/A	Cutting wet below ~34.0' BGS
	35.0	Sandstone, f-m gr., ~~light~~ ~~gray~~, wet, 2.5Y 6/2 lt. brownish gray				After 15½ hrs. W.L. @ 31.20' BGS.
	36.9		0.0 ppm	N/A	N/A	
	37.9					
	38.9		0.0 ppm	N/A	N/A	
	39.9					
	40.0	40.0	0.0 ppm	N/A	N/A	40.0
		End drilling (air rotary) @ 40.0' BGS.				End drilling.

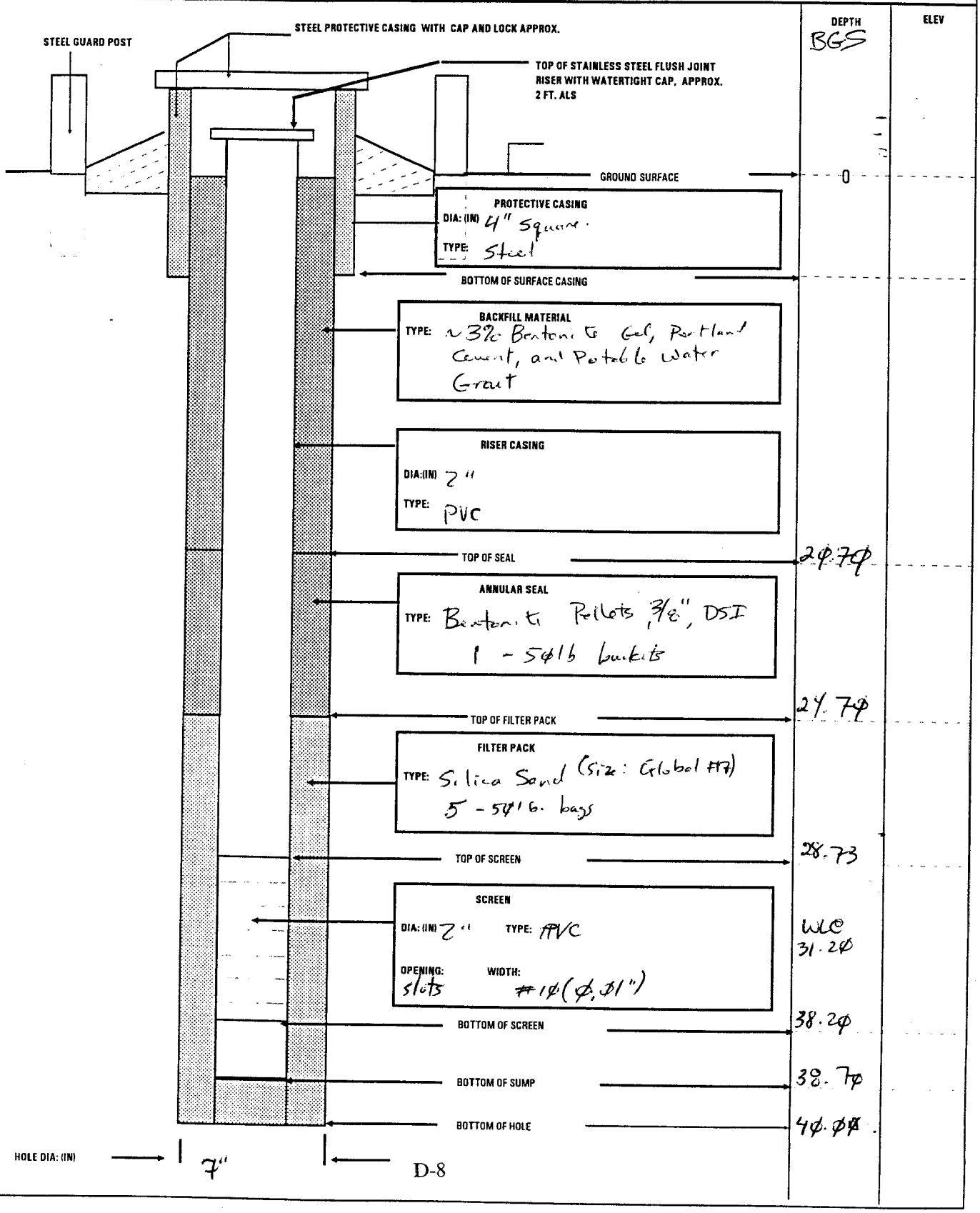
N564623.871
E2376725.854

PROJECT: LLI, Phase II, RVAAP, RI | HOLE NO: LLI-MW-78

MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: LL1-MW-078	**BEGIN:** 08/24/25/99 WLC 9-702	**END:** 08/25/26/99 WLC 9-702
COORDINATES: N: 564623.871 E: 2376275.854	**REFERENCE POINT:** TOC	**ELEVATION:** 995.84 MSL FT



HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling Co.	DISTRICT: Louisville; HOLE NUMBER: LL1-MW-79; SHEET 1 OF 45
3. PROJECT: RVAAP, LL1, Phase II RI	4. LOCATION: RVAAP, LL1, Ravenna, Ohio (vjb 11-29-99)	
5. NAME OF DRILLER: P. Brown.	6. MANUFACTURERS DESIGNATION OF DRILL: CME-75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6¼" ID HSA, 3" thin walled Shelby Tube, 6" tricone roller bit, NQ wireline core barrel & bit, D375Q John Deere (Sullivan) air compressor w/ oil/air separator.	8. HOLE LOCATION: See Sketch Below	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 08/19/99	11. DATE COMPLETED: 08/29/99 HS
12. OVERBURDEN THICKNESS: 1.1' BGS wea. bedrock / ~3.4' BGS competent bedrock	15. DEPTH GROUNDWATER ENCOUNTERED: Using H2O to core, could not identify where groundwater first encountered.	
13. DEPTH DRILLED INTO ROCK: HS Cored to 40.4' BGS, Air Rotary drilled to 39.5' BGS	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 38.10' BGS after ~1 hour = HS	
14. TOTAL DEPTH OF HOLE: 40.4' BGS HS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

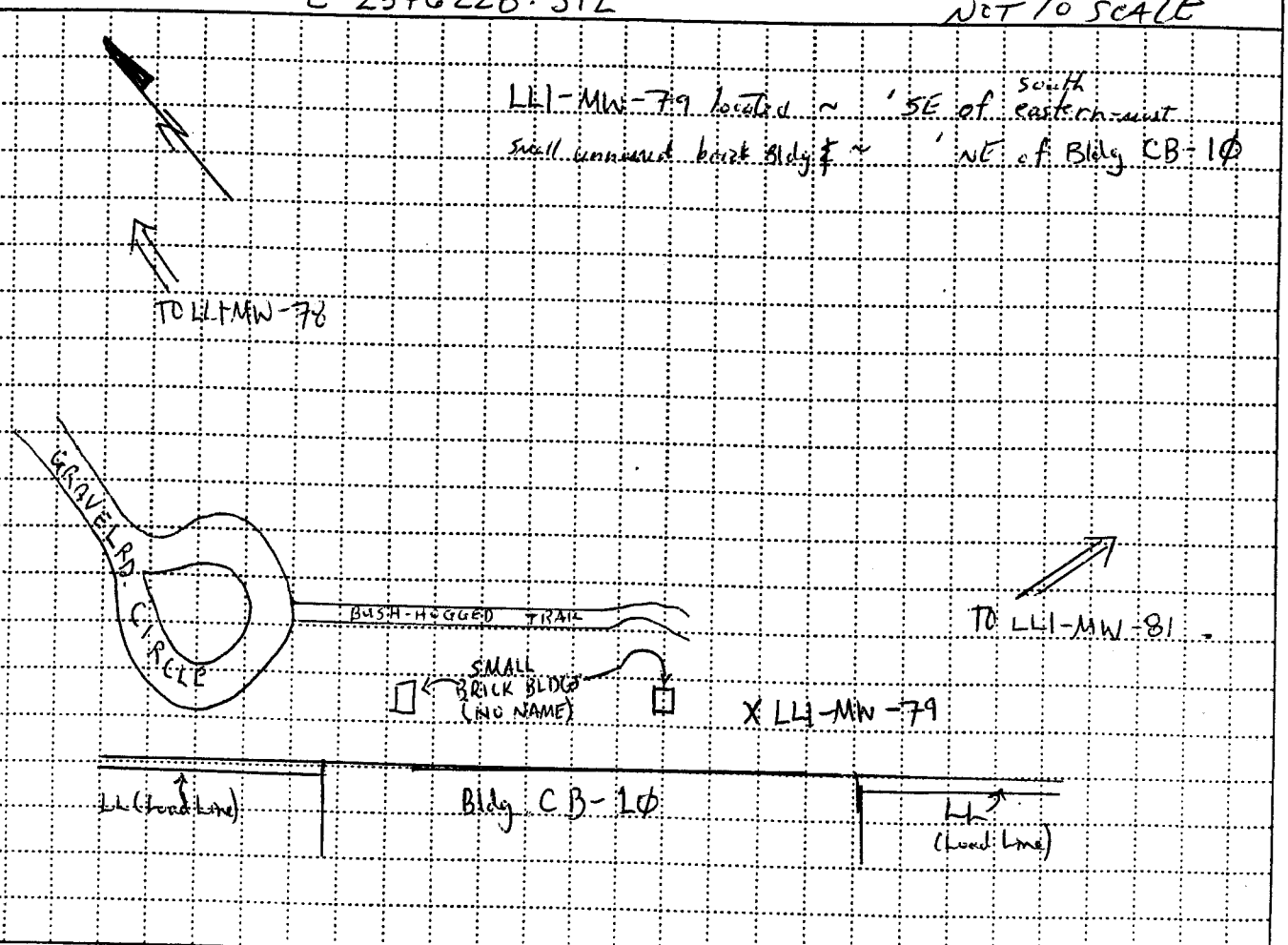
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
23 ft Wireline Core / 0 Shelby Tubes	N/A	N/A	#8

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
None	N/A	N/A	N/A	N/A	N/A	90

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
monitoring well set	N/A	2" PVC	N/A	Matthew Elles

LOCATION SKETCH/COMMENTS: N 563739.63, E 2376228.312

SCALE: NOT TO SCALE



PROJECT: RVAAP, LL1, Phase II RI

HOLE NO: LL1-MW-79

ENG FORM 5056-R, AUG 94

(Proponent CECW-EG)

DRILLING LOG

PROJECT: RVAAP, LL1, Phase II | INSPECTOR: M. West | HOLE NUMBER: LL1-MW-79 | SHEET: 2 of 4 5

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) - VJD 11-29-07
		Not sampled. Drill cutting show 0.0' to 3.0' BGS to consist of v. wea. f-m gr. sandstone & silt to f. gr. sand.	0.0 ppm	N/A	N/A	Could not push Shelby Tube or drive spoon (split) to achieve any recovery. Overburden consists of v. weathered bedrock.
	1.0	TOP OF WEA. BEDROCK. 1.1				Top of weathered bedrock @ 1.1' BGS
	2.0		0.0 ppm		N/A	
	3.0	BEGIN CORING 3.0		3.0		Begin coring @ 3.0' BGS
		SANDSTONE, thin bedded, 7/N lt. gray; hard, mod. cemented, med. gr., 1/0" from horiz. bedding, highly fractured (breaks every 0.2'-0.4'), highly weathered, shale partings common < 0.01' thick		Box 1 of 8		Cored (3.0'-6.0') 3.0' Rec 2.5" Loss 0.5"
	4.0		0.0 ppm		N/A	0.5' Loss likely cumulative for entire 3.0' run as rubble zones/ breaks are common in the core recovered
	5.0					Good circulation. Nearly 100% return. RQD = 0
	6.0	(Gradational contact) 6.0	0.7 ppm		N/A	
		SANDSTONE, thin bedded, 7/N lt. gray, hard to medium, mod. cemented, med. gr. 1/0" from horiz. bedding, highly fractured (breaks every 0.1'-0.4'), highly weathered, shale partings common < 0.001' thick				Cored (6.0'-11.0') 5.0' Rec 5.0' Loss 0.0 RQD = 0
	7.0			8.0		
	8.0		0.0 ppm	Box 2 of 8	N/A	
	9.0					
	10.0					

DRILLING LOG

PROJECT: RVAAP, LL1, Phase II RI | INSPECTOR: M Vest | HOLE NUMBER: LL1-MW-79 | SHEET: 3 of 45

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) v.j.b 11/29/95
	11.0	Same as above, but iron (red) staining increasing w/depth.	0.0 ppm	Box 2 of 8 (cont.)	N/A	Cored (6.0'-11.0') 5.0' Rec 4.8' 4.8 Loss 0.2' RQD = .4/4.8 = .08
	12.7		0.0 ppm		N/A	
	13.9			13.9		
				Box 3 of 8		
	14.7		0.0 ppm		N/A	
	15.8					15.8'-16.0' B.S. / loss was likely a shale, v. weathered
		Loss due to washout 16.0				
	16.0	SANDSTONE, thin-bedded, f/N lt. gray, hard to med., mod. cemented, med gr, ~10° from horiz. bedding, highly fractured, (breaks every 0.1' to 0.4') highly wea. (red staining throughout), shale partings common <0.01' thick	0.0 ppm		N/A	Cored (6.0'-21.0') 5.0' Rec 5.0' Loss 0.0' RQD = .9/5.0 = .18
	17.9					
	18.7		0.0 ppm	18.0	N/A	
				Box 4 of 8		
	19.0					
	20.9					

DRILLING LOG

PROJECT: RVAAP, LL1, Phase II RI | INSPECTOR: M. West / H. Smith | HOLE NUMBER: LL1-MW-79 | SHEET: 4 of 45

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) - VJB 11/29/91
		Same as above.	0.0 ppm		N/A	
		20.6'-21.0' zone of rubble/v. weath. rock.				Cored (21.0'-26.0') 5.0' Rec 3.5 Loss 1.5 RQD = 0
	22.0		0.0 ppm		N/A	
				23.0		
	23.0			Box 5 of 8		
	24.0		0.0 ppm		N/A	
		24.5				
		Loss of 24.5' to 26.0' BGS; likely due to washout of v. weathered material and 0.5' left in borehole which cannot be retrieved.				
	25.0					
		26.0	0.0 ppm	26.0	N/A	
	26.0	Ran Short run - Retrieved .5 from earlier run ? .4 from this run - (SAME MATERIAL AS ABOVE)		Box # 6 of 8		End coring @ 26.0' BGS. WL in borehole after pumping out coring water & waiting 35 min is 23.90' BGS. - After 2 days reads is dry
	26.5	Run 5'				
	27.0					Run # ~~5~~ 6 Run 0.5 Rec 0.9 .5 From earlier Core is over drilled RQD = 0
		Sandstone, thin bedded, 7/N lt. grey hard to Medium, moderately Cemented med. grained ~10° from horizontal bedding. highly fractured (breaks every 0.1 - 0.5')				
	28.0		0.0 ppm 20.6% O_2		N/A	
	29.0	Moderate weathering Shale interbeds common ~.001' thick, brownish red iron Staining found from 29-30.5 fairly heavy - lt staining on rest of the core.				Run # 7 Run: 5' Rec: 5' Loss: 0 RQD: 1.46/5.0 = .292
	30.0					

PROJECT: RVAAP, LL1, Phase II RI | HOLE NO: LL1-MW-79

DRILLING LOG

PROJECT: RVAAP, LLI, Phase 2 RI | INSPECTOR: Heather L Smith | HOLE NUMBER: LLmw079 | SHEET: 5 of 5 | 50

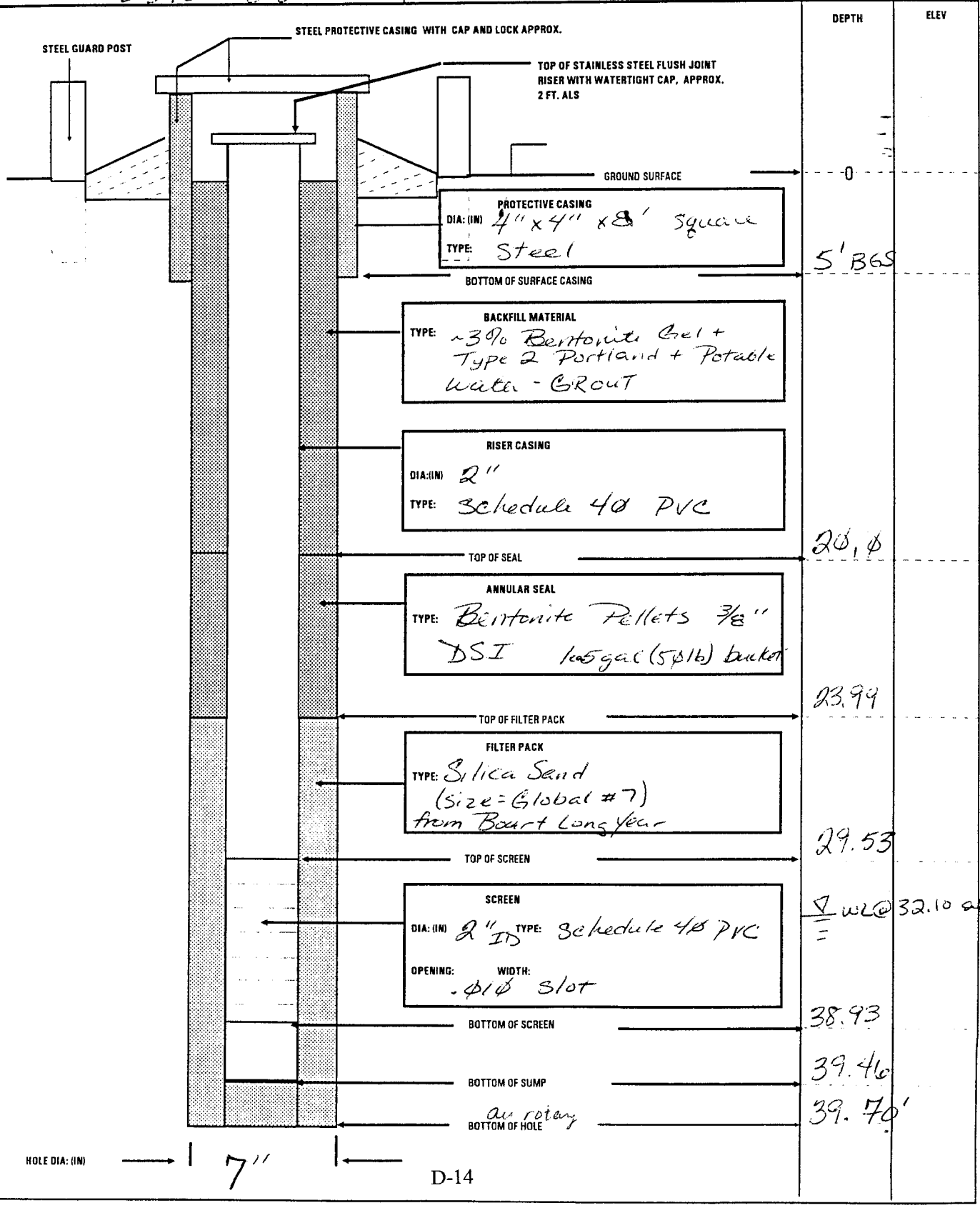
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	31.0			BOX # 7 of 8		
		RUN (SAME AS ABOVE) Sandstone, thin bedded 7/N Lt. grey, hard to Medium, moderately cemented, medium grained, ~10° from horizontal bedding. Highly fractured; however, Some pieces are getting larger between breaks. Moderate Weathering Shale interbeds common ~.01' thick, light iron staining is decreasing w/ depth Iron staining is gone at ~35' BGS.				RUN # 8 RUN: 5.0 REC: 5.0 LOSS: 0 RQD: 1.38 / 5.0 = .276
	36.0			BOX # 8 of 8		
		RUN Same material as above. except fractures are now predominantly .6' apart. starting from ~36.5' BGS.				RUN # 9 RUN 4.0' REC 3.9 LOSS 0.1 RQD = .785 N 563739.63 E 2376228.312 Air Rot to 39.7
	39.0					B.O.B. 40.4' BGS

PROJECT: RVAAP, LLI, Phase 2 RI | HOLE NO: LLmw079

MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: LL/mw Ø19	**BEGIN:** Ø8/23/99	**END:** 8/28/99
COORDINATES: N: 563739.63 E: 2376228.312	**REFERENCE POINT:** TOC	**ELEVATION:** 991.87 **MSL** FT



HTRW DRILLING LOG

1 COMPANY NAME: SAIC	DISTRICT: Louisville	HOLE NUMBER: LLI-MW-8Φ
	2 DRILL SUBCONTRACTOR: Miller Drilling Co.	SHEET 1 OF 4 SHEETS
3 PROJECT: RVAAP, LLI, Phase II RI	4 LOCATION: RVAAP, LLI, Phase II, Ravenna, Ohio	
5 NAME OF DRILLER: P. Brown	6 MANUFACTURERS DESIGNATION OF DRILL: CME-75	
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: ~~2" split spoon~~ 4¼"ID HSA, 6" PVC casing, HQ wireline core barrel & bit, 6" tricone roller bit, D375Q John Deere (Sullivan) air compressor w/ oil/air separator.	8 HOLE LOCATION: See Sketch Below	
	9 SURFACE ELEVATION:	
	10 DATE STARTED: 8/18/99	11 DATE COMPLETED: 8/22/99
12 OVERBURDEN THICKNESS: Φ.Φ' (No overburden)	15 DEPTH GROUNDWATER ENCOUNTERED: Using water to core, could not identify where groundwater first encountered	
13 DEPTH DRILLED INTO ROCK: ~~25'~~ 24.5'	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 12.6' BGS after 72Φ hrs from coring completion.	
14 TOTAL DEPTH OF HOLE: ~~25' BGS~~ 24.5' BGS	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

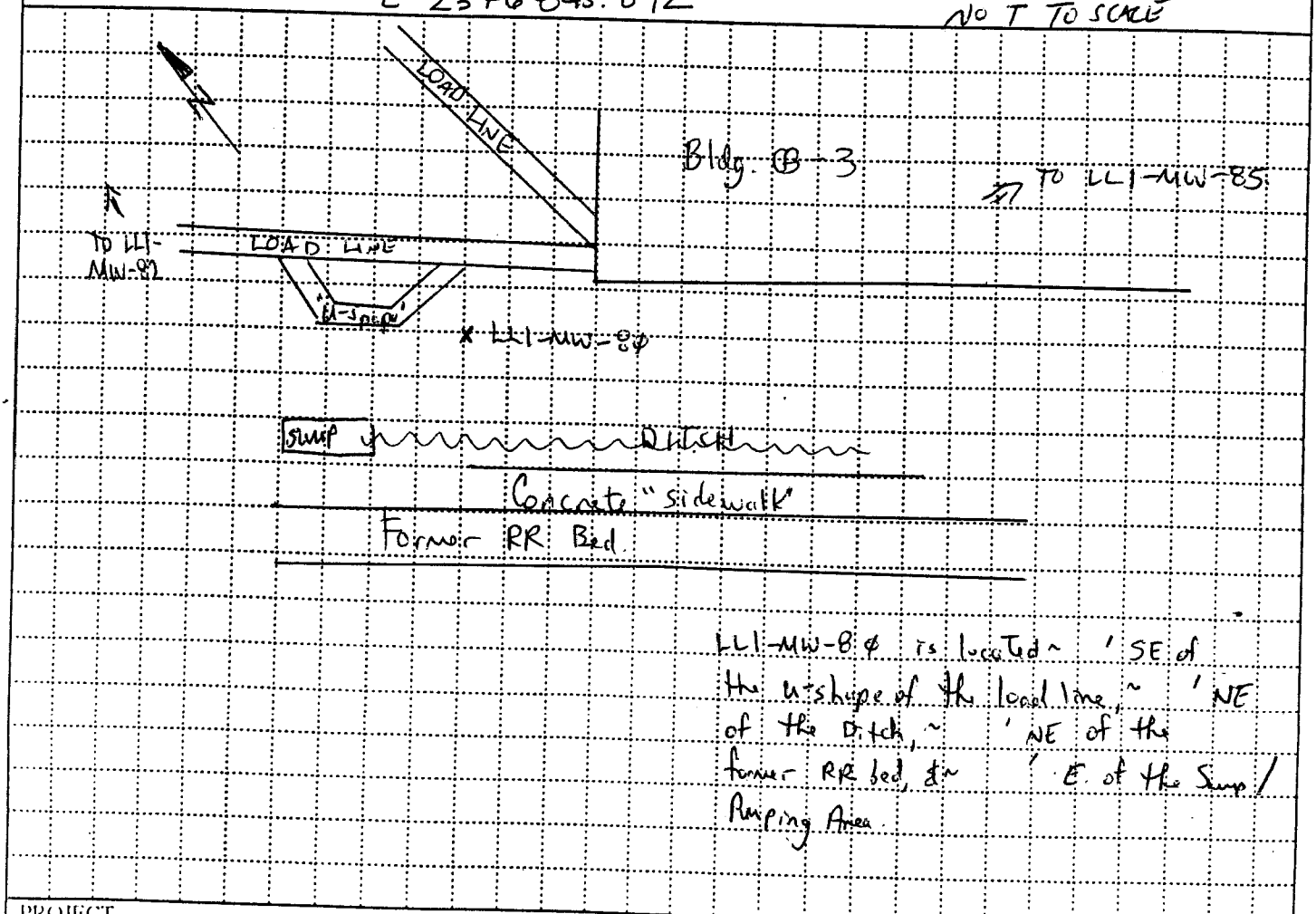
18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
16.3 ft of core | Φ Shelby Tubes	NONE	N/A	3

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY
None	N/A	N/A	N/A	N/A	N/A	87%

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
Installed well	N/A	2" PVC	N/A	Matthew B. West

LOCATION SKETCH/COMMENTS: N 562479.728 E 2376845.072

SCALE: NOT TO SCALE



LLI-MW-8Φ is located ~ ' SE of the w-shape of the load line, ~ ' NE of the Ditch, ~ ' NE of the former RR bed, & ~ ' E of the Sump / Pumping Area.

PROJECT	HOLE NO
RVAAP, LLI, Phase II RI	LLI-MW-8Φ

ENG FORM 5056-R, AUG 94 (Proponent CECW-EG)

DRILLING LOG

PROJECT: RVAAP, LL1, Phase II RI | INSPECTOR: M. Vest | HOLE NUMBER: LL1-MW-80 | SHEET: 2 of 4

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	NOT Sampled w/ split spoon. Rock @ surface (0.0' BGS) Cutting show rock to be a med. gr. sandstone	0.0 ppm	N/A	N/A	Rock @ surface (0.0' BGS) No Shelby Tube could be taken (no overburden). Augered (w/out sampling) to 5.0' BGS in order to get the ~~0' chips~~ coring tools in borehole. (Rig stroke only 7')
	1.0					
	2.0		0.0 ppm		N/A	
	3.0					
	4.0		0.0 ppm		N/A	
	5.0	5.0		5.0		
	5.0	SANDSTONE, thin bedded, 7/N light gray, hard, mod. cemented, m. gr., bedding ~15° from horizontal, unbroken, h. wea., breaks common, shale partings common <0.01' thick. 5.2		Box 1 of 3		Begin coring @ 5.0' BGS. Ran 5.3 Rec 4.95 Cored (5.0' - 10.3) 5.3' Loss 0.35' Using ~200 gal. of water to core 5.0' to 10.3 BGS.
	6.0	No Recovery 5.4	0.0 ppm		N/A	
	7.0					Core has many breaks throughout and is stained red throughout. (Breaks every ~0.1 - 0.4').
		(Gradational Contact) 7.9				Circulation @ ~25% from ~5'-8' BGS. Loss of all circulation below 8.0' BGS.
	8.0	SANDSTONE, thin bedded, 7/10YR lt. gr. gray, hard, mod. cemented, f.-m. gr., bedding ~10° from horiz., highly to moderately weathered (decreasing w/ depth), breaks common, shale partings common <0.01' thick.	0.0 ppm		N/A	RQD = 3.1 / 4.95 = .63
	9.0			9.95 Box 1 of 3		
	10.0					

PROJECT: RVAAP, LL1, Phase II RI | HOLE NO: LL1-MW-80

DRILLING LOG

PROJECT: RVAAP, Phase II, LLI RI | INSPECTOR: M. Vest | HOLE NUMBER: LLI-MW-8ϕ | SHEET: 3 of 4

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)
	11.ϕ	Same As Above	ϕ.ϕppm	Box 2 of 3 (cont)	N/A	Cored 5.ϕ'(14.3-15.3'BGS) Rec 5.ϕ' Loss ϕ.ϕ' RQD = 4.1/5.0 = .82
	12.ϕ		ϕ.ϕ ppm		N/A	Wh. & air rotary reaming wet cutting blown out of borehole @ N 12.5' BGS.
	13.ϕ	13.1				No red staining present below 14.ϕ' BGS w/ most staining absent below 13.1' BGS.
	14.ϕ	SANDSTONE, thin bedded, MN lt. gray, hard, mod. cemented, f-m.gr., bedding 1ϕ° from horiz., unweathered, breaks common, shale partings common <ϕ.ϕ1' thick.	ϕ.ϕppm	14.95	N/A	
	15.ϕ			Box 3 of 3		Cored 1.ϕ'(15.3'-16.3'BGS) Rec 1.ϕ' Loss ϕ.ϕ'
	16.ϕ		ϕ.ϕppm		N/A	(Cored only 1.ϕ' run so that driller could get his rods on the same length of run as the rig stroke). RQD .65/1 = .65
	17.ϕ					Cored 5.ϕ(16.3'-21.3'BGS) Rec 3.5 Loss 1.5
	18.ϕ		ϕ.ϕppm		N/A	(Bottom ~1.5' is falling out of core barrel & cannot retrieve it. RQD = 2.3/3.5 = .657
	19.ϕ	19.8				
	20.ϕ	No Recovery	ϕ.ϕ ppm		N/A	

PROJECT: RVAAP, LLI, Phase II RI | HOLE NO: LLI-MW-8ϕ

DRILLING LOG

PROJECT: RVAAP, LL1, Phase II RI | INSPECTOR: M. West | HOLE NUMBER: LL1-MW-80 | SHEET: 4 of 4

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)
	21.0	(Same as above (presumed)) No recovery 19.8'-21.3' BGS.	0.0 ppm	Box 3 of 3 (cont.)	N/A	End coring @ 21.3' BGS
		21.3		21.3		
		End coring. Sandstone, m/w lt. gray, f.-m.-g.-s., wet.	N/A	N/A	N/A	WL - not able to be determined prior to reaming due to fall-in. Begin air rotary drilling @ 13.1' BGS to ream; ~~21~~ 21.3' BGS.
	23.0					
	24.0		0.0 ppm	N/A	N/A	
		24.5 ~~25.0~~				
	25.0	End drilling @ ~~25.0'~~ 24.5 BGS.			25.0	End air rotary drilling @ 25.0' BGS.
	26.0					25.0
	27.0					
	28.0					
	29.0					
	30.0					

PROJECT: RVAAP, LL1, Phase II RI | HOLE NO: LL1-MW-80

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DRILLING LOG

PROJECT: RVAAP, LL1, Phase I RI | INSPECTOR: M. Vest | HOLE NUMBER: LL1-mw-8Ø | SHEET: 4 of 4

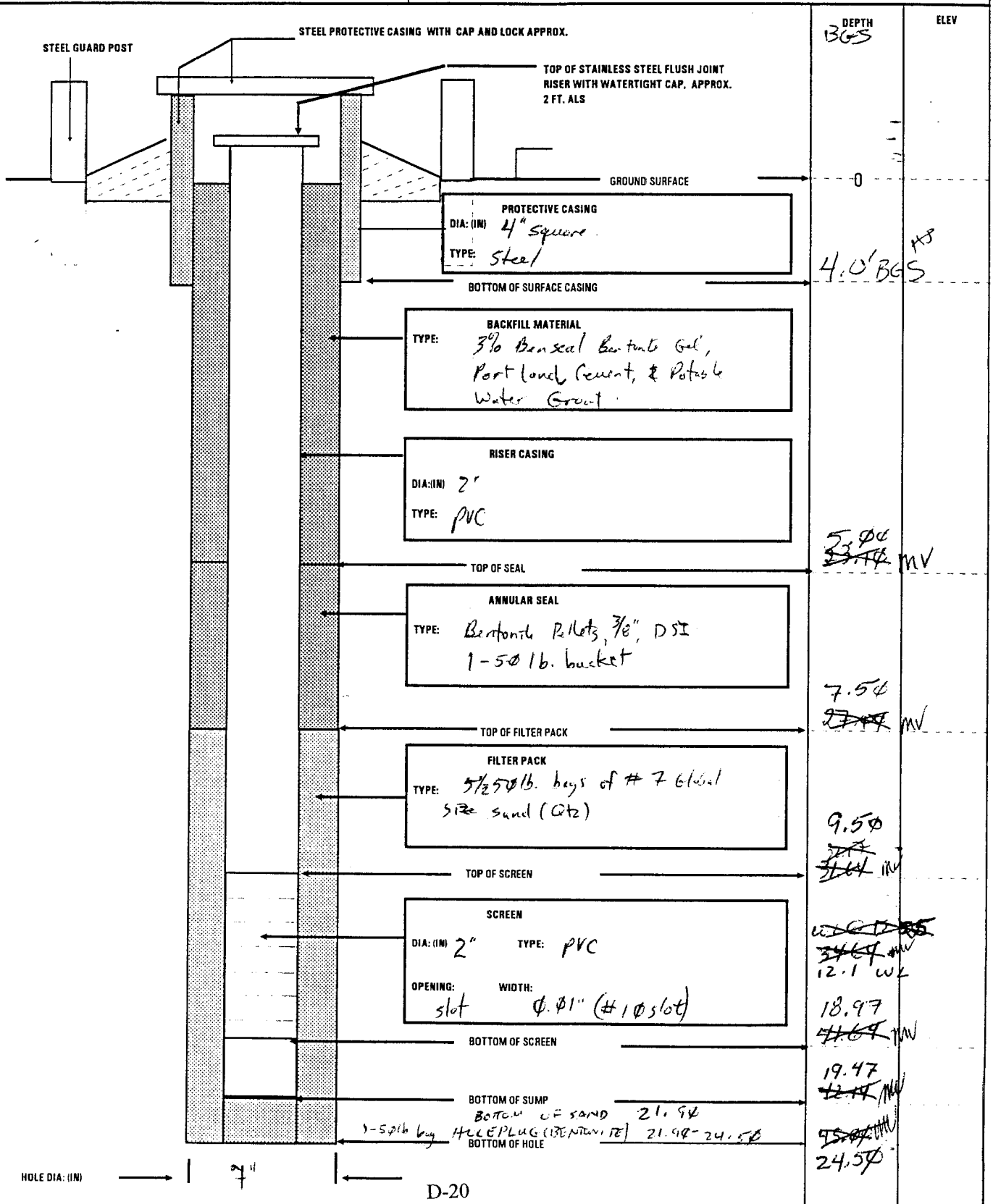
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		(Same as above, presumed) No Recovery 19.8'-21.3' BGS	Ø.Ø ppm	Box 3 of 3 (cont.)	N/A	
	21.Ø	21.3		21.3		End coring @ 21.3' BGS
		End coring @ 21.3				
		Sandstone, F/N, lt. gray, f-m gr., wet.		N/A		WL not able to be measured after coring, but prior to reaming due to fallin/blockage.
	22.Ø		P.Ø ppm		N/A	
						Begin air rotary @ 13.1' BGS Ream to 21.3' BGS. Cont. air rotary to 24.5' BGS to reach adequate depth for setting well.
	23.Ø					
						Air rotary advancing @ ~1' per 10 min. in unconsol rock.
	24.Ø		Ø.Ø ppm		N/A	
		End drilling @ 24.5' BGS				End air rotary drilling @ 24.5' BGS.
	25.Ø					Total water used (~710 gal) for coring/drilling.
						N 562479.728 E 2376845.072

PROJECT: RVAAP, LL1, Phase II, RI | HOLE NO: LL1-mw-8Ø

MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: LL1-MW-08C	**BEGIN:** 08/23/99	**END:** 08/24/99
COORDINATES: N: 562479.728 E: 2376845.072	**REFERENCE POINT:** TOC	**ELEVATION:** 996.27 MSL Ft



HTRW DRILLING LOG

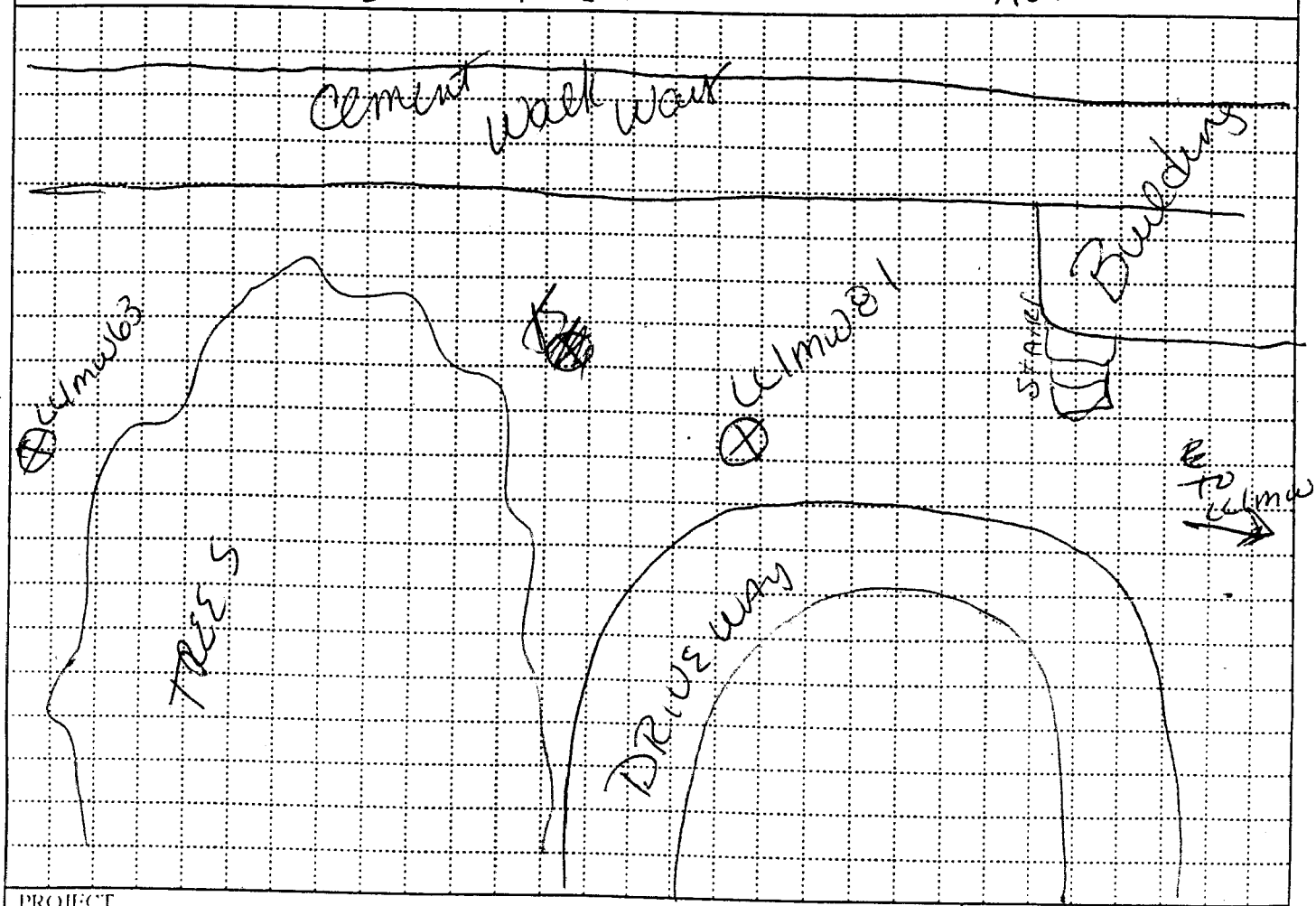
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Miller Drilling Company	DISTRICT: Louisville; HOLE NUMBER: LLmw081; SHEET 1 OF 5
3. PROJECT: RUAAP, Phase II Remedial Investigation of LL1	4. LOCATION: RUAAP, LL1, near bldg # CB-4, Ravenna Ohio	
5. NAME OF DRILLER: Pete Brown	6. MANUFACTURERS DESIGNATION OF DRILL: CME-75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6" PVC casing; HQ Wireline Core Barrel; 6" tricone roller bit; 4¼" I.D. hollow stem auger	8. HOLE LOCATION: See sketch below.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 08/19/99	11. DATE COMPLETED: 08/24/99
12. OVERBURDEN THICKNESS: 2.1'	15. DEPTH GROUNDWATER ENCOUNTERED: 37.61' BGS = Depth where we 1st blew water during air rot.	
13. DEPTH DRILLED INTO ROCK: 40.4' BGS	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 31.69' BGS after ~20 hrs.	
14. TOTAL DEPTH OF HOLE: 40.4' BGS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
Shelby tube	—	X (1.0-2.1' BGS)	7

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
None taken while drilling	—	—	—	—	—	94.3%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	—	2"	—	Kathy L Smith

LOCATION SKETCH/COMMENTS: N 543462.725 E 2376672.655 SCALE: None.



PROJECT	HOLE NO
RUAAP, Phase II RI of LL1	LLmw081

ENG FORM 5056-R, AUG 94

(Proponent CECW-EG)

DRILLING LOG

PROJECT: RVAAP, Phase II RI of LL1 | INSPECTOR: Heather Smith | HOLE NUMBER: LLmw081 | SHEET: 2 of 3

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ELEV (A)	DEPTH (B) BGS	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	0.5	TOP Soil / roots	Øppm 20.7% O_2			Augered through top soil & roots to 1' to run geotechnical sample in soil.
	1.0			1.0'		
	1.5	Shelby tube - Geotechnical Sample		Shelby Tube sample LL1-MW-ØØ1-ØØ1Ø-ST vjb 12-7-19		TOOK geotechnical Sample from 1.0' to TOP of rock at 2.1' BGS
	2.0			2.1'		
	2.5	Rock cuttings indicate rock is med. gr. Sandstone	Øppm			Augered (w/out sampling) from 2.1 - 3.0' BGS to set 6" casing.
	3.0					
	3.5	SandStone - thin bedded, 7N light grey, hard, moderately cemented medium grained, bedding is 5-15° off horizontal, moderately to highly weathered, highly fractured, Breaks every Ø.5' → Ø.2' along the core. Breaks show Red Staining (90% of time) Some staining on intact core sections as well.		Start Core Box #1 of 4		RUN : 3.0' RECOVER : 2.9' LOSS : Ø.1' TIME START 1205 TIME FINISH 1220 R.Q.D = Ø
	4.0		Øppm 20.6% O_2			
	4.5					
	5.0					
	5.5					
	6.0	LOSS				
	6.5	Same as above				RUN : 5.0' RECOVER : 4.4' LOSS : Ø.6' TIME START 1225 TIME FINISH 1240 RQD = Ø
	7.0		Øppm			
	7.5		20.6% O_2			
	8.0			CORE BOX # 2 of 4		
	8.5					
	9.0					
	9.5					
	10.0					

PROJECT: RVAAP, Phase II RI of LL1 | HOLE NO: LLmwØ81

DRILLING LOG

PROJECT: RVAAP, Phase II RI of LL1 | INSPECTOR: Heather Smith | HOLE NUMBER: LL1mw081 | SHEET: 3 of 5

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)
	10.0					10.0
		LOSS	Ø ppm	CORE BOX #2 cont		
	11.0	(SAME AS ABOVE)	20.6% O2			11.0
		Sandstone - thin bedded 7N Light grey, hard, moderately cemented medium grained, bedding is 5-15° off horizontal, moderately to highly Weathered, highly fractured Breaks every 0.05' to 0.2' along the core. Breaks Show red staining ~90% of the time. Red staining found on core body as well (on intact sections)				RUN : 5.5' RECOVER : 4.9' LOSS : 0.6' ST. TIME : 1250 FINISH TIME : 1305 R.Q.D = Ø
	12.0		Ø ppm			12.0
	13.0			CORE BOX #3 of 7		13.0
	14.0					14.0
			Ø ppm			
	15.0		20.7% O2			15.0
	16.0	LOSS				16.0
		(SAME AS ABOVE)				
	17.0	Sandstone - thin bedded 7N Light Grey, hard, moderately cemented, medium grained, bedding is 5-15° off horizontal moderately to highly weathered, highly fractured.	Ø ppm			17.0 RUN : 5.4' RECOVER : 4.5' LOSS : 0.5' START : 1310 FINISH : 1330 RQD = 1.0/4.5 = .222
	18.0			CORE BOX #4 of 7		18.0
	19.0		Ø ppm			19.0
		Red Staining darkens & is over entire .5' section of core (on breaks & ON body of core)	20.7% O2			
	20.0					20.0

PROJECT: RVAAP, Phase II RI of LL1 | HOLE NO: LL1mw081

DRILLING LOG

PROJECT: RVAAP, Phase II RI of LL1 | INSPECTOR: Heather Smith | HOLE NUMBER: LLmw081 | SHEET: 4 of 5

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GLOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	20.5	Dk. red staining returns to red staining as seen on the rest of this core previously	Ø ppm	CORE Box #4 of 7		
	21.Ø	LOSS				
	21.5	(SAME AS ABOVE)				RUN : 5.Ø' RECOVER : 4.9' LOSS : ~~Ø.5~~ Ø.1' START : 14ØØ FINISH : 1415 RQD = 2.9/4.9 = .644
	22.Ø		Ø ppm			
	22.5	Red staining is decreasing w/ depth	2Ø.6% O2			
	23.Ø			CORE BOX #5 of 7		
	23.5	Red staining nearly gone				
	24.Ø	Sandstone - thin bedded 7N Light Grey, hard, moderately cemented medium grained, bedding is 5-15° off horizontal Moderately weathered. fractured now ev. Ø.2→ Ø.5' intravels. no red staining fractures along bedding planes.	Ø ppm			
	24.5					
	25.Ø					
	25.5					
	26.Ø		Ø ppm			
	26.5	LOSS Ø.1' (Bottom of coring #1)		26.5		Bottom of Coring 8-19-94 *Resume Coring 8-22-94
	27.Ø	Sandstone - thin bedded 7N Light Grey, hard, moderately cemented, medium grained, bedding is 5-15° off horizontal Moderately weathered. fractured every Ø.2-Ø.5' intravel. Red staining almost entirely gone. Some cross bedding seen,	2Ø.6% O2	CORE Box #6 of 7		RUN : 5.2 RECOVER : 5.2 LOSS : Ø. START : 1425 FINISH : 1440 RQD = 1.6/5.2 = .308 * We returned to continue coring to depth.
	28.Ø		Ø ppm			
	28.Ø	(same AS ABOVE - RUN #5)				
	29.Ø					
	30.Ø					

PROJECT: RVAAP, Phase II RI of LL1 | HOLE NO: LLmw081

DRILLING LOG

HOLE NUMBER LL1mw081 | 36

PROJECT Phase II RI on LL1 | INSPECTOR Heather L Smith | SHEET 5 of 5

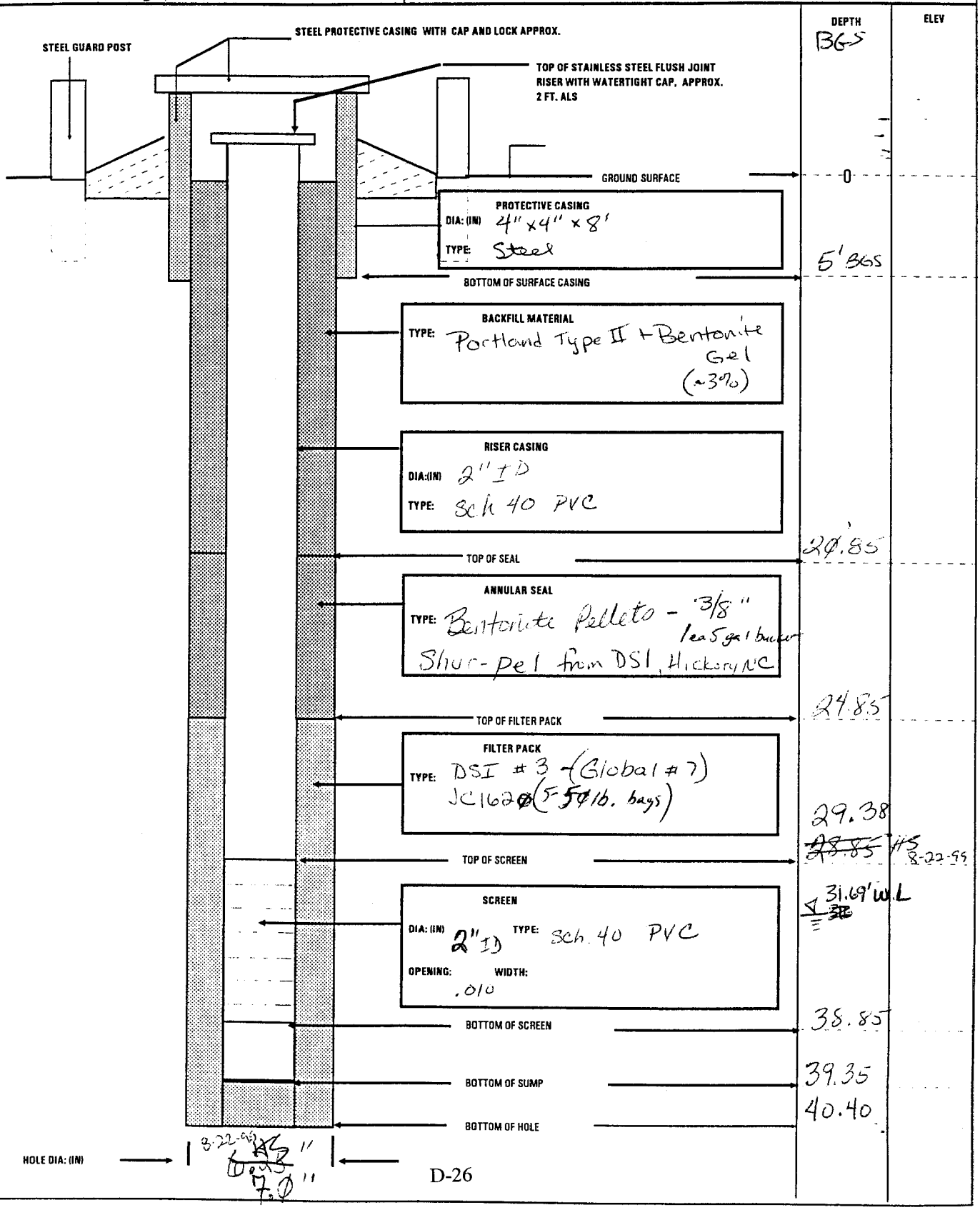
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	31.2	Same as above	Ø ppm			
			20.6 %O2	CORE BOX # 7 of 7		W.T. @ 31.69' BGS 8-23-99
	32.0					RUN : 4.7 Recover : 4.7 Loss : Ø.Ø START : 1450 FINISH : 1510 RQD = 1.7 / 4.7 = .362
	33.2	Same as above (1st) Complete unfractured Section of Sandstone (the rest of the core is fractured ev. Ø.2 - Ø.5' as above)	Ø ppm 20.6 %O2			
	34.2					
	35.0					
	36.0	end of 2nd coring				end of 2nd Coring
	37.2	Cuttings indicate Sandstone - fine to med. grained wet grey	Ø ppm 20.6 %O2	NA	NA	Air Rotary to T.D of 40.40' BGS No core taken. N 563462.725 E 2376672.655
	38.0					
	39.2					
		BOB 40.40' BGS				B.O.B. 40.40' BGS

PROJECT RVAAP, Phase II RI on LL1 | HOLE NO LL1mwØ81

MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: LL1mw081	**BEGIN:** 08-22-99	**END:** 08-23-99
COORDINATES: N: 563462.725 E: 2376672.655	**REFERENCE POINT:** TOC	**ELEVATION:** 998.12 MSL ft



HTRW DRILLING LOG

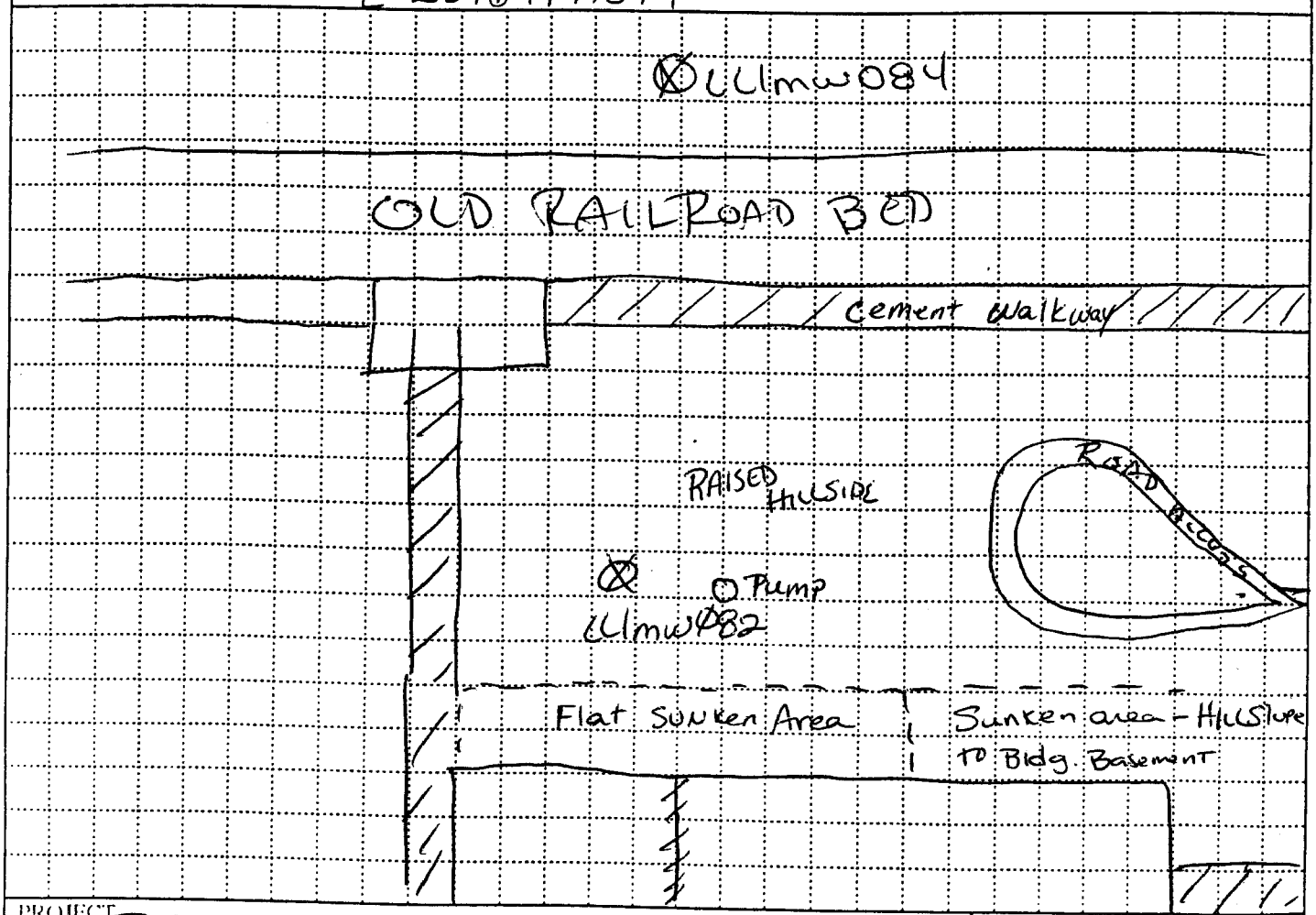
1 COMPANY NAME: SAIC	2 DRILL SUBCONTRACTOR: Miller Drilling Company	DISTRICT: Louisville; HOLE NUMBER: LLmw082; SHEET 1 OF 5 SHEETS
3 PROJECT: RVAAP, LLI, Phase 2 RI	4 LOCATION: LLI near bldg CB-4A	
5 NAME OF DRILLER: Pete Brown	6 MANUFACTURERS DESIGNATION OF DRILL: CME-75	
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: • 6" Tricone roller bit • D375Q Air Compressor w/ oil/air Seperator • Support truck & trailer	8 HOLE LOCATION: see map	
	9 SURFACE ELEVATION:	
	10 DATE STARTED: 08-27-99	11 DATE COMPLETED: 08-28-99
12 OVERBURDEN THICKNESS: 1.8'	15 DEPTH GROUNDWATER ENCOUNTERED: ~30.5' BGS	
13 DEPTH DRILLED INTO ROCK: to 39.5' BGS	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:	
14 TOTAL DEPTH OF HOLE: 39.5' BGS	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
Shelby tube	—	X	N2

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY
	—	—	—	—	—	NA %

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
	—	2"	—	Heather L Smith

LOCATION SKETCH/COMMENTS: N 562956.86 E 2376977.379 SCALE: NONE



PROJECT: RUAAP, LLI, Phase 2 RI — HOLE NO: LLmw08

ENG FORM 5056-R, AUG 94 (Proponent CECW-EG)

DRILLING LOG

HOLE NUMBER: LL/mw082

PROJECT: RVAAP, LL, Phase 2 RI

INSPECTOR: Heather Smith

SHEET: 2 of 5

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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)
	0.5	Shelby Tube taken Sampled ϕ-1.8	ϕ ppm	Shelby tube sampled	LL1-	MW-ϕ82-ϕϕϕ1-ST vjb 12-7-99
	1.ϕ		2ϕ.6% O_2			
	1.5					
	2.ϕ	1.8 Resistance @ 1.8' BGS		1.8		
	2.5	Cuttings indicate alternating layers of med. → fine gr. Sandstone dry 2.5Y6/2				Begin Air Rotary drilling at ~1.8' BGS. I will log this hole using cuttings, but there is a delay in the time they are cut & the time they are blown out the top of the hole. Measurements are not exact.
	3.ϕ					
	3.5	⅔ Silty Sand ⅓ weathered Stained Sandstone med → fine gr. dry. (layers ~.5' thick ea)	ϕ ppm 2ϕ.6% O_2			
	4.0					
	4.5ϕ					
	5.0	Sandstone med → fine grained dry 2.5Y6/2 Lt brownish grey w/ some iron staining on cuttings				
	6.ϕ					
	6.5					
	7.ϕ		ϕ ppm 2ϕ.6% O_2			
	7.5					
	8.0					
	8.5					
	9.ϕ					
	9.5					

PROJECT

HOLE NO

DRILLING LOG

PROJECT: RVAAP, LLI, Phase 2 RI | INSPECTOR: Heather Smith | HOLE NUMBER: LLImw082 | SHEET: 3 of 5

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)
	10.0	Same as above	0ppm 20.6% O_2	NA	NA	description from Air Rotary cuttings only
	11.0					
	12.0					
	13.0		0 20.6% O_2			
	14.0			NA	NA	
	15.0					
	16.0		0ppm 20.6% O_2			
	17.0					
	18.0			NA	NA	
	19.0		0ppm 20.6% O_2			
	20.0					

PROJECT: RVAAP, LLI, Phase 2 RI | HOLE NO: LLImw082

DRILLING LOG

PROJECT: RVAAP, LL1, Phase 2 RI | INSPECTOR: Heather Smith | HOLE NUMBER: LL1mw082 | SHEET: 4 of 5

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)
	20.0	Same as above	0 ppm	NA	NA	Air Rotary Drilling
	21.0		20.6%			
	22.0					
	23.0					
	24.0		0 ppm	NA	NA	
	25.0		20.6%			
	26.0					
	27.0		0 ppm	NA	NA	
	28.0		20.6%			
	29.0					
	30.0					

PROJECT: RVAAP, LL1, Phase 2 RI | HOLE NO: LL1mw082

DRILLING LOG

PROJECT: RVAAP, Phase 2 RI @ LL1 | INSPECTOR: Heather Smith | HOLE NUMBER: LL1mw082 | SHEET: 5 of 5

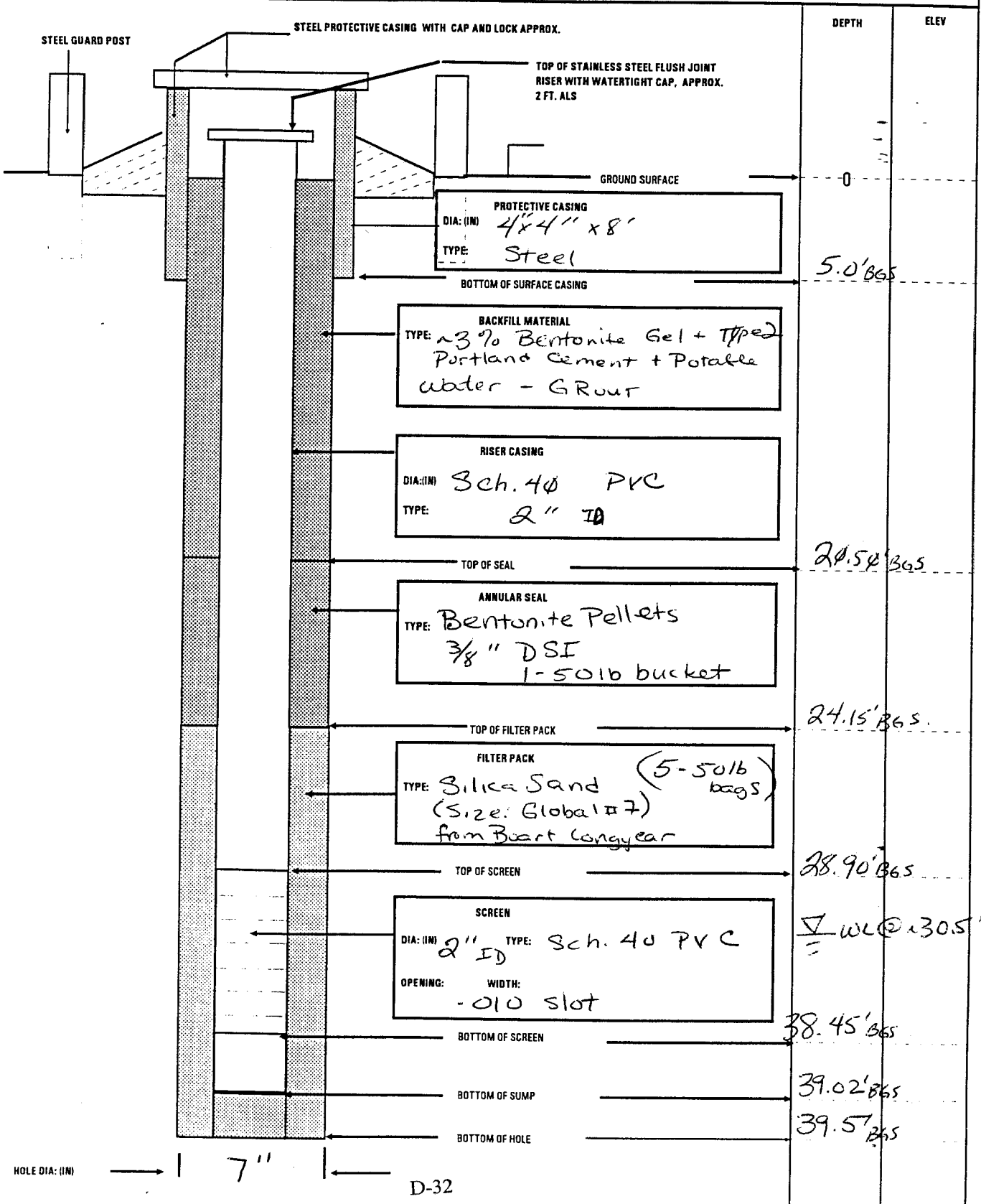
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	30.0	Same as above WL ~ 30.5' BGS	0 ppm 20.6%	NA	NA	Air Rot. Drilling
	31.0					
	32.0					
	33.0					
	34.0		0 ppm 20.6%	NA	NA	
	35.0	Same as above (only wet)				
	36.0					
	37.0		0 ppm 20.6	NA	NA	
	38.0					N 562956.86 E 2376977.379
	39.0					
						B.O.B 39.5
	40.0					

PROJECT: RVAAP, Phase 2 RI @ LL1 | HOLE NO: LL1mw082

MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: LLmw082	**BEGIN:** 08-27-99	**END:** 08-28-99	
COORDINATES: N: 562956.86 E: 2376977.379	**REFERENCE POINT:** TOC	**ELEVATION:** 1006.45 MSL FT.	



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HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DISTRICT: Louisville	HOLE NUMBER: LLI-MW-83
	2. DRILL SUBCONTRACTOR: Miller Drilling Co.	SHEET 1 OF 5 SHEETS
3. PROJECT: RVAAP, LL1, Phase II RI	4. LOCATION: RVAAP, LL1, Ravenna, Ohio	
5. NAME OF DRILLER: P. Brown	6. MANUFACTURERS DESIGNATION OF DRILL: CME-75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Split spoon, 6" tricone roller bit, D375Q John Deere (Sullivan) Air Compressor w/ oil/air separator	8. HOLE LOCATION: See Sketch Below	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 08/25/99	11. DATE COMPLETED: 08/26/99
12. OVERBURDEN THICKNESS: 0.2' (MW Hydro)	15. DEPTH GROUNDWATER ENCOUNTERED: 1st hit water btwn 27-28' BGS HS	
13. DEPTH DRILLED INTO ROCK: 39.5' BGS HS	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: WL @ 32.16 after ~72 hours HS	
14. TOTAL DEPTH OF HOLE: to 39.5' BGS HS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): WL@ 32.5' after ~24 hrs. HS	

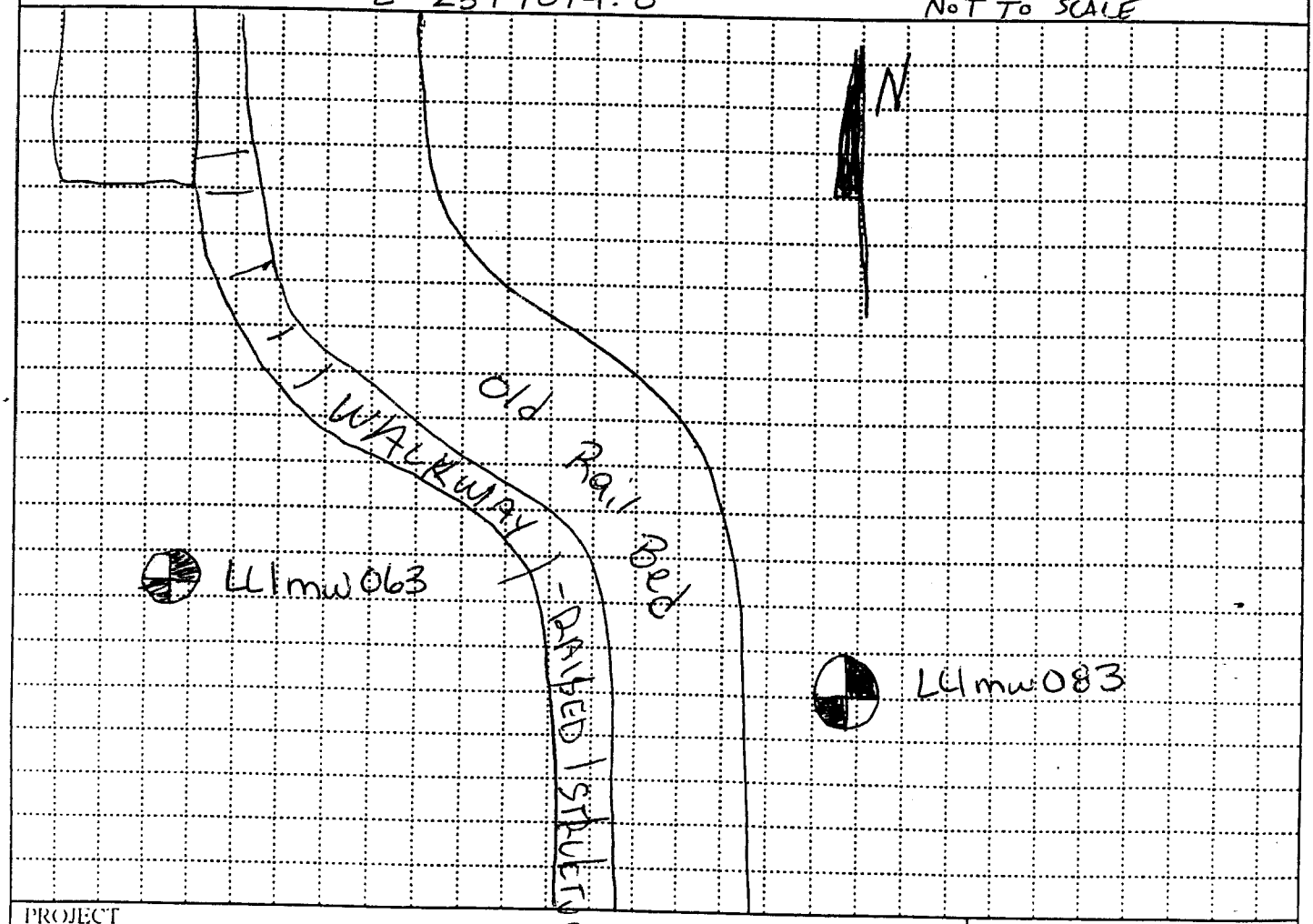
18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
None	N/A	N/A	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
None	N/A	N/A	N/A	N/A	N/A	N/A

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Set Monitoring well	N/A	4" PVC	N/A	Matthew B. Vest / Heather Smith

LOCATION SKETCH/COMMENTS: N 563612.754, E 2377074.8

SCALE: NOT TO SCALE



PROJECT	HOLE NO
RVAAP, LL1, Phase II RI	LLI-MW-83

ENG FORM 5056-R, AUG 94

(Proponent CECW-EG)

DRILLING LOG

PROJECT: RVAAP, LL1 Phase II | INSPECTOR: M. Vest | HOLE NUMBER: LL1-MW-83 | SHEET: 2 of 5

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 & Gravel				
		Split spoon Refusal @ 0.2'	0.0 ppm	N/A	N/A	Spoon refusal @ 0.2' BGS on weath. bedrock. Beg. in Air Rotary drilling @ 0.2' BGS
	1.0	Sandstone, f-m gr., 7½ gray, dry.				
	2.0		0.0 ppm	N/A	N/A	Drill advancement rate ~~@ 1 ft / 10 sec~~ Note in weath. material @ ~2.3' per 10 min, but slows to ~1.2' per 10 min @ 3½' BGS and below.
	3.0					Likely v. weathered bedrock 0.2' – 3.5' BGS, more competent bedrock below 3.5' BGS.
	4.0	Sandstone, f-m gr, 2.5Y 6/2 lt. brownish gray, dry.				
	5.0		0.0 ppm	N/A	N/A	Rock descriptions logged w/ cuttings from air rotary. Depths are not exact to 1/10 ft due to delay in some cuttings return
	6.0					
	7.0					
	8.0					
	9.0					
	10.0					

PROJECT: RVAAP, LL1, Phase II, RI | HOLE NO: LL1-MW-83

DRILLING LOG

PROJECT: RVAAP, LLI, Phase II, RI | INSPECTOR: M. Vest | HOLE NUMBER: LLI-MW-083 | SHEET: 3 of 5

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)
	11.0	Sandstone, f-m grained, 2.5Y 6/2 lt. brownish gray, dry.	0.0 ppm	N/A	N/A	Drill rate still @ ~ 1'-2' per minute
	12.0		0.0 ppm	N/A	N/A	
	13.0					
	14.0					
	15.0		0.0 ppm	N/A	N/A	
	16.0					
	17.0					
	18.0		0 ppm	N/A	N/A	
	19.0					
	20.0		0.0 ppm	N/A	N/A	

PROJECT: RVAAP, LLI, Phase II, RI | HOLE NO: LLI-MW-083

DRILLING LOG

PROJECT: RVAAP, LLI, Phase II | INSPECTOR: M. West | HOLE NUMBER: LLI-MW-83 | SHEET: 4 of 5

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)
		Sandstone, f-m gr., 2.5Y 6/2 lt. brownish gray, dry.	0.0 ppm	N/A	N/A	Drill rate @ ~1'-2' per 1φ minutes.
	21.0					
	22.0					
	23.0					
	24.0					
	25.0					
	26.0					
	27.0	27.0				
		Sandstone, f-m gr; 2.5 Y 6/2 lt brownish gray, wet.			#8	Cutting begin to be wet below 27.0' BGS.
	28.0					
	29.0					
	30.0					

PROJECT: RVAAP, LLI, Phase II RI | HOLE NO: LLI - MW-83

DRILLING LOG

PROJECT: RVAAP, LLI, Phase II RI | INSPECTOR: M. Vert / H. Smith | HOLE NUMBER: LLI-MW-83 | SHEET: 5 of 5

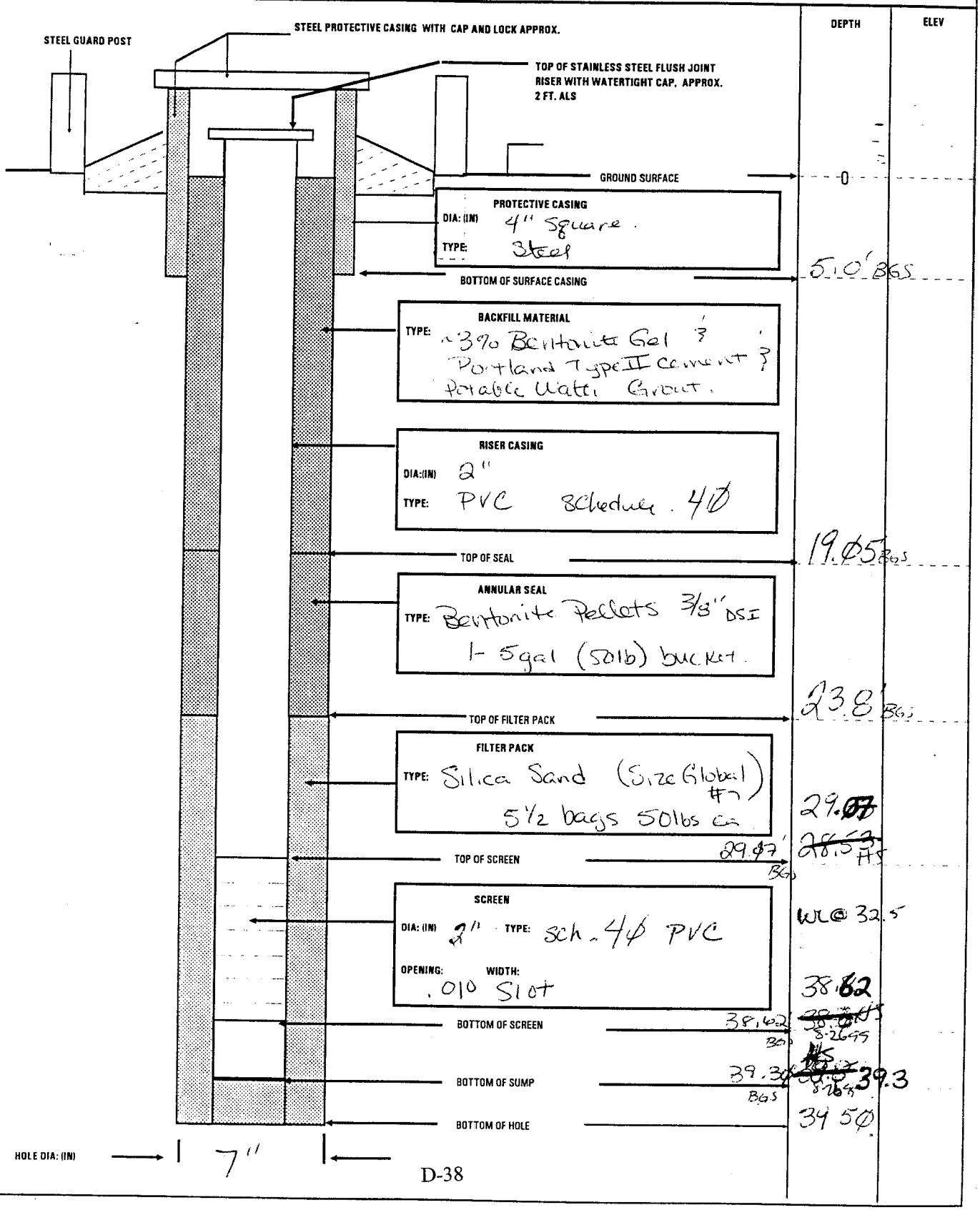
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	31.0	Sandstone, f-m gr., 2.5Y 6/2 lt. brownish gray, ~~dry~~ wet.	0.0 ppm	n/a	n/a	Drill rate @ ~ 1' per 16 min.
	32.0		0.0 ppm	n/a	n/a	Cuttings wet (Wet) @ ~27' BGS (but Water Table stabilized @ 32.5' BGS)
	33.0	Sandstone, fine-medium grained 2.5Y 6/2 lt. brownish gray, wet (from cuttings)				
	34.0					
	35.0		0.0 ppm	n/a	n/a	
	36.0					
	37.0		0.0 ppm	NA	NA	
	38.0					N 563612.754 E 2377074.0
	39.0					
	39.5					B.O.B 39.5'
	40.0					

PROJECT: RVAAP, LLI, Phase II, RI | HOLE NO: LLI-MW-83

MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: LL1mw083	**BEGIN:** 08-26-99	**END:** 08-27-99
COORDINATES: N: 563612.754 E: 2377074.8	**REFERENCE POINT:** TOC	**ELEVATION:** 995.2 MSL FT



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HTRW DRILLING LOG

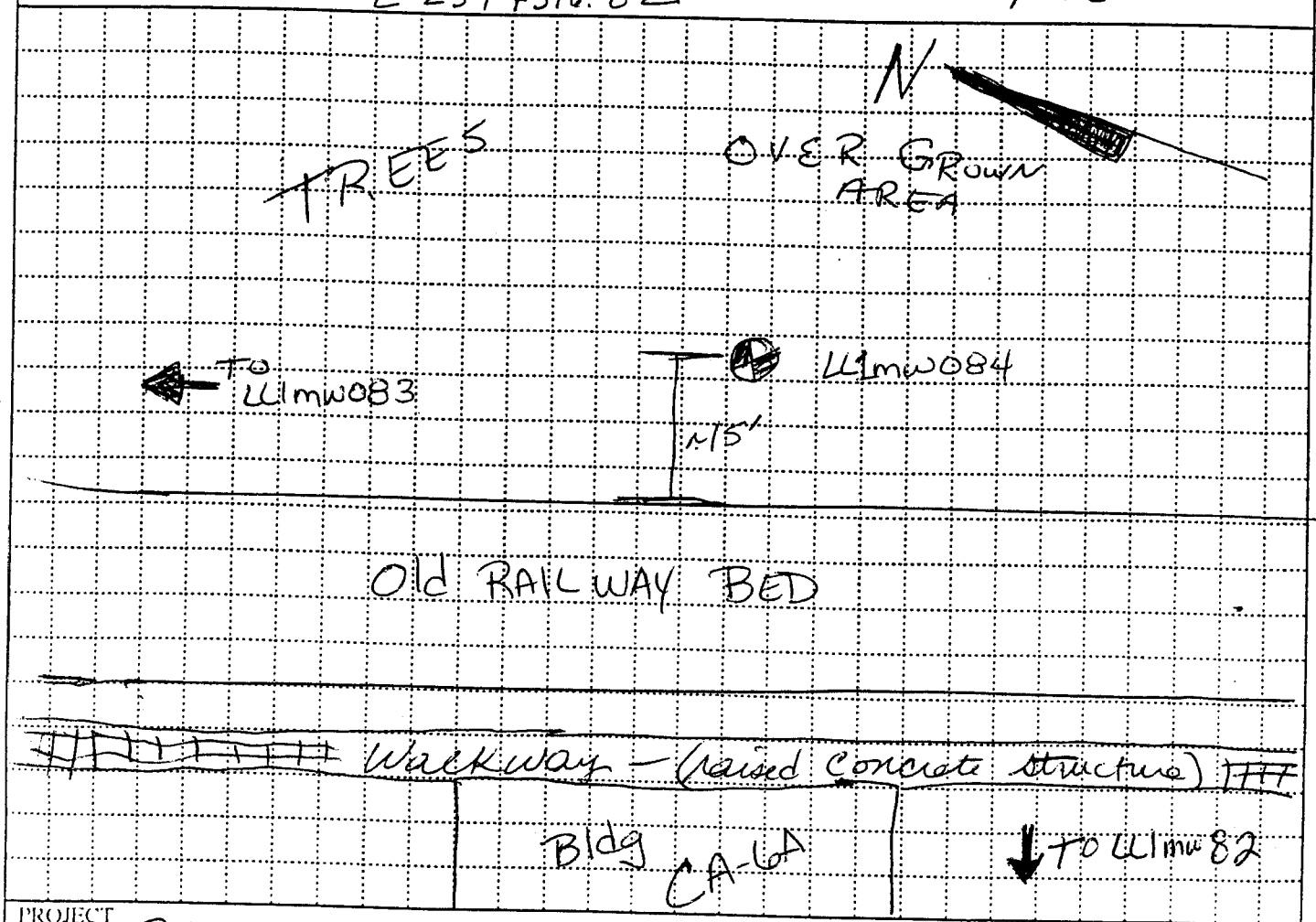
1. COMPANY NAME: SAIC	DISTRICT: Louisville	HOLE NUMBER: LLmw084
	2. DRILL SUBCONTRACTOR: Miller Drilling Company	SHEET 1 OF 5 SHEETS
3. PROJECT: RVAAP, Loadline 1, Phase 2 RI	4. LOCATION: Load Line 1, RVAAP	
5. NAME OF DRILLER: Pete Brown	6. MANUFACTURER'S DESIGNATION OF DRILL: CME-75	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Split Spoon; 6" tricone roller bit; 0375@ Air Compressor W/ air/oil Seperator. 1 Support truck	8. HOLE LOCATION: See map	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 08-26-99	11. DATE COMPLETED: 08-27-99
12. OVERBURDEN THICKNESS: 2'	15. DEPTH GROUNDWATER ENCOUNTERED: evidence there is some water at 27-29' BGS	
13. DEPTH DRILLED INTO ROCK: to 37.2' BGS	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 32.3' BGS after ~2 hrs.	
14. TOTAL DEPTH OF HOLE: 37.2' BGS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 29.10' BGS after ~16 hrs.	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
Not taken			NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
	—	—	—	—	—	N/A

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
	—	2"	—	Heather J Smith

LOCATION SKETCH/COMMENTS: N 563160.442, E 2377316.02 — SCALE: NONE



PROJECT	HOLE NO
RVAAP, Load Line 1, Phase 2 RI	LLmw084.

ENG FORM 5056-R, AUG 94 (Proponent CECW-EG)

DRILLING LOG

PROJECT: RVAAP LL1 Phase 2 RI | INSPECTOR: Heather Smith | HOLE NUMBER: LL1mw084 | SHEET: 2 of 5

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)
		TOP Soil / Roots				Split Spoon ran to 2.0' BGS. TOP of Rock at 2.1. At. Top of Rock- begain air rotary
		Silt w/ Sand				
		DRY, hard.				
	1.0	Sandy Silt	20.6% O_2			Split Spoon: RUN 2.0 Rec. 2.0
	2.0					
		2.1 TOP of Rock Sandstone Med-fine grained 2.5y 6/2 lt. brownish gray dry		N2	N2	Descriptions are of Cuttings during Air Rotary drilling. Depths are approx. due to time laps between actual drilling at depth & blowing cuttings out of the top of the hole.
	3.0					
			20.6% O_2			
	4.0					
	5.0					
	6.0					
		Sand stone fine to med. grained 2.5y 6/2 lt brownish gray dry	20.6% O_2	N2	N2	Running @ ~1' Per 10 minutes.
	7.0					
	8.0					
	9.0					

PROJECT: RVAAP, LL1 Phase 2 RI | HOLE NO: LL1mw 084

DRILLING LOG

PROJECT: RVAAP, Load Line 1, Phase 2 RI | INSPECTOR: Heather Smith | HOLE NUMBER: LL1mw084 | SHEET: 3 of 5

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)
	11.Ø	Sandstone fine-med. grained 2.5y6/2 lt. brownish grey dry	Ø	N2	N2	Air Rotary Drilling looking @ cuttings
	12.Ø		Ø	N2	NA	
	13.Ø					
	14.Ø		Ø	N2	NA	
	15.Ø		Ø			
	16.Ø	Same as above	Ø	N2	NA	
	17.Ø					
	18.Ø		Ø	N2	NA	
	19.Ø		Ø			

PROJECT: RVAAP, LL1, Phase 2 RI | HOLE NO: LL1mw084

DRILLING LOG

PROJECT: RVAAP, LLI @ Phase 2 RI | INSPECTOR: Kathy L Smith | HOLE NUMBER: LLimw084 | SHEET: 4 of 5

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GLOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
	21.0	same as above	0	NA	NA	air rotary drilling looking @ cuttings
	22.0		0			
	23.0			NA	NA	
	24.0		0			
	25.0			NA	NA	
	26.0	same as above w/ slightly less staining on rock	0			
	27.0		0	NA	NA	Cuttings get moist some. Water evident between 27.0 & 28.0 'BGS
	28.0		0			
	29.0			NA	▽	Color turned to grey not as much brownish staining Water level @ 29.10 'BGS after standing 12+hrs.
	30.0		0			

PROJECT: RVAAP, Phase 2 RI @ LLI | HOLE NO: LLimw084

DRILLING LOG

PROJECT: RVAAP, Phase 2, RI @ LL1 | INSPECTOR: H. Smith | HOLE NUMBER: LL1mw084 | SHEET: 5 of 5

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)
	31.0	Same as above	0	NA	NA	
	32.0		0	NA	NA	* Water table recharge to 32.3 after ~2 hrs. - Recharged to 29.10' after 12+ hrs.
	33.0					
	34.0		0	NA	NA	
	35.0					
	36.0		0	NA	NA	
	37.0					B.O.B. 37.2
	38.0					N 563160.442 E 2377316.02
	39.0					

30.4 31.0 32.4 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

PROJECT: RVAAP, Phase II RI@LL1 | HOLE NO: LL1mw084

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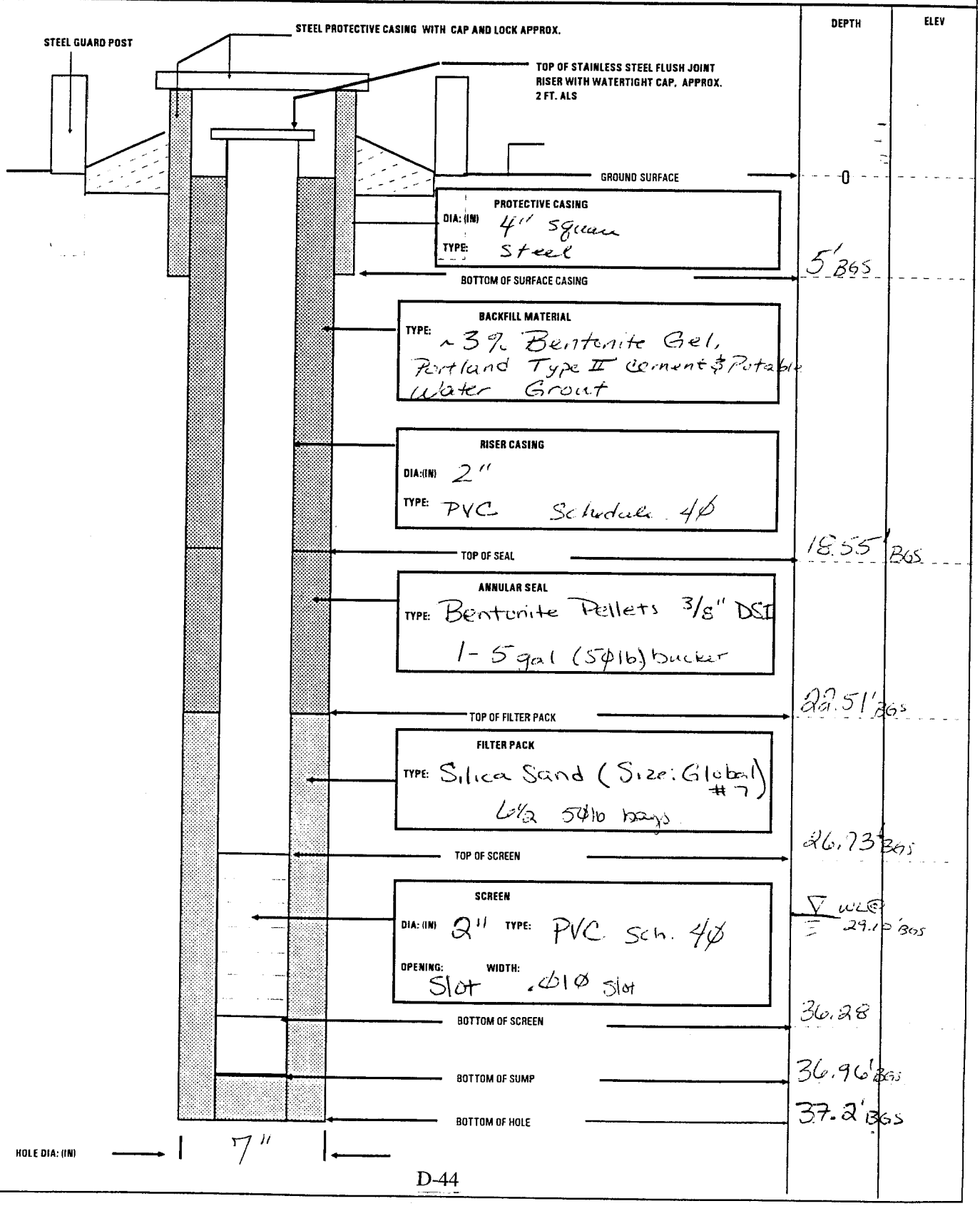
MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: LL/mw084	**BEGIN:** 03 27-99	**END:** 03 27-99
COORDINATES: N: 563160.442 E: 2377316.02	**REFERENCE POINT:** TOC	**ELEVATION:** 198.73 MSL FT.



HTRW DRILLING LOG

1 COMPANY NAME: SAIC	DISTRICT: Louisville	HOLE NUMBER: MW-85
2 DRILL SUBCONTRACTOR: Miller Drilling Co.		SHEET 1 OF 5 SHEETS
3 PROJECT: RVAAP, LL1, Phase II RI	4 LOCATION: RVAAP, LL1, Ravenna Ohio	
5 NAME OF DRILLER: P. Brown.	6 MANUFACTURERS DESIGNATION OF DRILL: CME-75	
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 2" Spl. + Spoon (steel) 4¼" ID HSA, 6" PVC casing, HQ wireline core barrel & bit, 6¾" tricone roller bit, D375Q John Deere (Sullivan) air compressor w/ oil/air separator	8 HOLE LOCATION: See Sketch Below	
	9 SURFACE ELEVATION:	
	10 DATE STARTED: 08/17/99	11 DATE COMPLETED: 08/21/99
12 OVERBURDEN THICKNESS: 6.1' BGS	15 DEPTH GROUNDWATER ENCOUNTERED: Using water to core, would not identify where groundwater first encountered	
13 DEPTH DRILLED INTO ROCK: 38.9 'BGS Total (6.1'-45.0' BGS)	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 35.5' BGS after 1hr / 35.5' after 24 hrs.	
14 TOTAL DEPTH OF HOLE: 45.0 'BGS	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

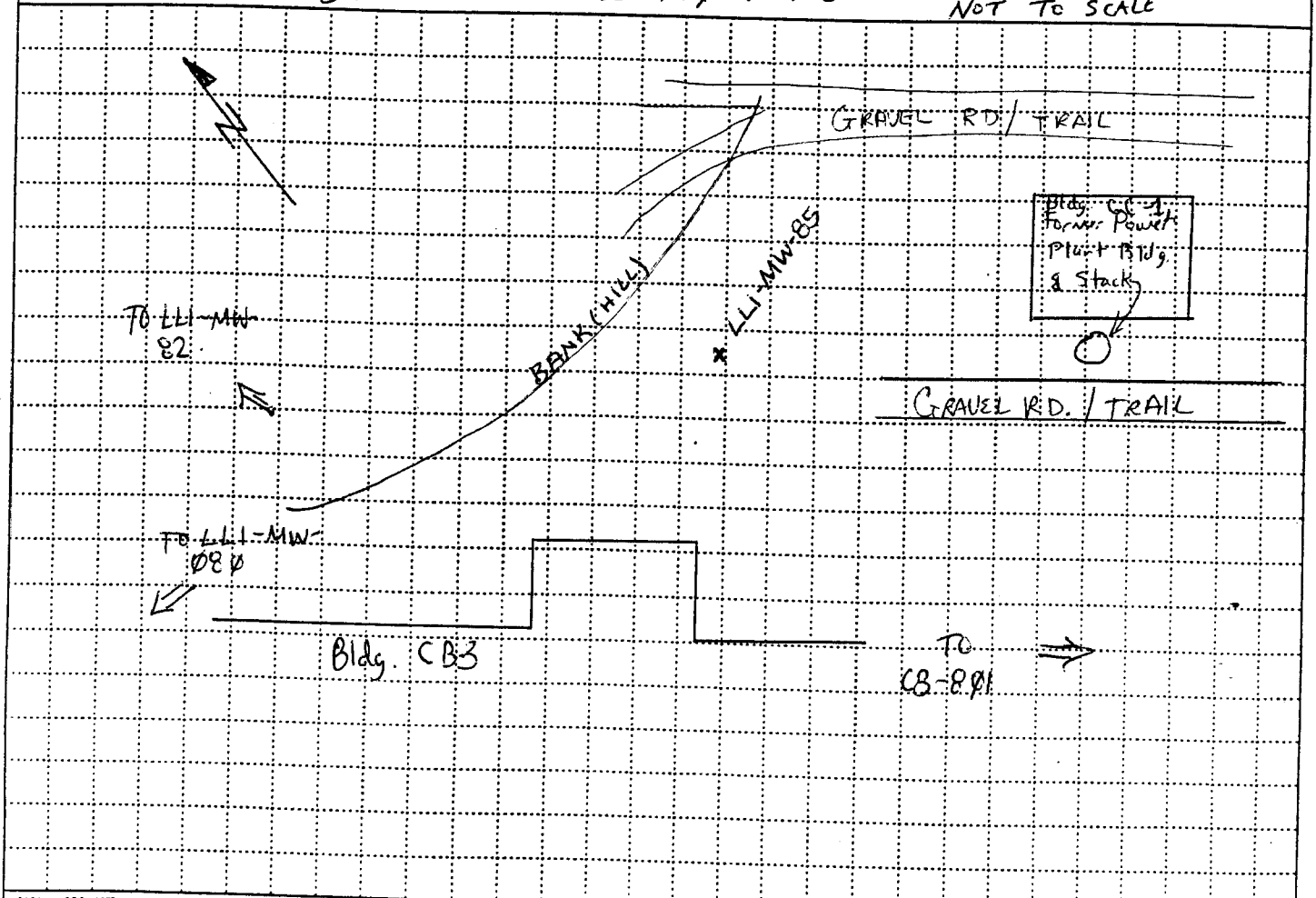
18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
15.3 ft of core / Shelby Tubes	N/A	Shelby Tubes	4

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY %
None	N/A	N/A	N/A	N/A	N/A	98%

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
installed well	N/A	2" PVC	N/A	Matthew B. Vest

LOCATION SKETCH/COMMENTS: N 562046.245 E 2377646.938 (2)

SCALE: NOT TO SCALE



PROJECT: RVAAP LL1, Phase II RI

HOLE NO: LL1-MW-85

ENG FORM 5056-R, AUG 94

(Proponent CECW-EG)

DRILLING LOG

PROJECT: RVAAP, LL1, Phase II RI | INSPECTOR: M. Vest | HOLE NUMBER: LL1-MW-~~01~~ 85 | SHEET 2 of 5

5

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)
		Top soil w/ grass roots & rock fragments.	Ø.Ø ppm		N/A	sample w/ 2" split spoon Ø' to Ø.3' Refusal. Auger Ø.3' - 2 Ø' BGS. Ran Ø.3' Rec Ø.3'
	1.Ø	No Sample Taken.				
		2.Ø				
	2.Ø	SILTY SAND, 10YR 4/2 v. pale brown, loose, non-plas., f. gr., dry, w/ ~15% rock fragments (SS) up to 2" dia.	Ø.Ø ppm		N/A	Push / Drive spoon 2.Ø' - 4.Ø' BGS. Ran 2.Ø Rec 1.Ø
		3.Ø				
	3.Ø	No Recovery.				No recovery 3.Ø' - 4.Ø' BGS due to spoon shoe plugged w/ rock fragments.
		4Ø				
	4.Ø	SILTY SAND, 10YR 6/2, v. pale br., med. to hard, non-plas., v. f. gr., dry w/ ~45% rock fragments (sandstone) up to 2" dia.	Ø.Ø ppm		N/A	Push/Drive spoon 4.Ø' - 6.Ø' BGS. Ran 2.Ø' Rec 1.2'
	5.Ø					
		5.2				
		No Recovery				No recovery 5.2' to 6.Ø BGS due to spoon shoe plugged w/ rock fragment
		6.Ø				
	6.Ø	Same as above 6.1		6.1	N/A	Spoon refusal @ 6.1' BGS. Begin coring @ 6.1' BGS
		SANDSTONE, thin bedded, 2.5Y 7/2 light gray, hard, mod. cemented, m. gr., horizontal bedding, weathered moderately, breaks continuously (weathered), loss	Ø.Ø ppm	Box 1 of 4		Loss of circulation within Ø.5 ft into rock (6.6' BGS)
	7.Ø					Cored 5.Ø' (6.1' - 11.1' BGS) Rec 3.4' Loss 1.6' RQD = Ø Fractures occur every Ø.1 - Ø.4' throughout core.
	8.Ø		Ø.Ø ppm		N/A	
		8.8				
	9.Ø	SANDSTONE w/ silt, thin bedded, shale lens, 7/1 10Y lt. gr. gray, medium hardness, moderately cemented, f. gr., sl. wea., breaks common (weathered). 9.3	Ø.Ø ppm		N/A	
	10.Ø	SHALE, thin bedded, 5/1 10Y greenish gray, soft, horiz. bedding, highly wea., core loss from (cont)				

PROJECT: RVAAP, LL1, Phase II RI | HOLE NO: LL1-MW-~~01~~ 85

DRILLING LOG

HOLE NUMBER LLI-MW-85

PROJECT RVAAP, LLI, Phase II RI | INSPECTOR M Vest | SHEET 3 of 5

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)
		~~Red/Brn~~ 9.5' to 11.1' BGS. Bottom of shale interval (9.5' BGS) weathered to a clay. 9.5	Φ.Φ ppm	Box 1 of 4 (cont)	N/A	Loss of core from 9.5' - 11.1' BGS. Probable weathered shale interval too soft to core. Bottom Φ.1 ft of recovered core (9.5' BGS) is highly wea. shale.
	11.Φ	No Recovery 11Φ		11.1		
		SANDSTONE, thin bedded, 7/N lt. gray, hard, mod. cemented, f-m gr., 10° from horiz. bedding, unwea., breaks common w/ wea. staining on 11.4' BGS break, shale partings common less than Φ.ΦΦ1' thick.		Box 2 of 4		Cored 5.3' (11.1'-16.4' BGS) Rec 5.3' Loss Φ.Φ' ~~Picked pieces~~ RQD = 1.4/5.3 = .264
	12.Φ		Φ.Φ ppm		N/A	
	13.Φ					
	14.Φ		Φ.Φ ppm		N/A	
	15.Φ					
	16.Φ		Φ Φ ppm	16.4 Box 3 of 4	N/A	
		16.4 ~~Light~~				
	17.Φ	SANDSTONE, thin bedded, 7/N lt. gray, hard, mod cemented, m. gr., 1Φ° from horiz. bedding, unwea, breaks common, shale parting common < Φ.ΦΦ1' thick.				Cored 5.Φ' (16.4'-21.4' BGS Rec 5.Φ' Loss Φ.Φ' RQD = 2.1/5.0 = .42
	18.Φ		Φ.Φ ppm		N/A	
	19.Φ					
	20.0		Φ.Φ ppm		N/A	

PROJECT RVAAP, LLI, Phase II R.I | HOLE NO LLI-MW-85

DRILLING LOG

PROJECT: RVAAP, LL1, Phase II RI | INSPECTOR: MiVest | HOLE NUMBER: LL-MW-85 | SHEET: 4 of 5

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)
		Same as above.	0.0 ppm	Box 3 of 4 (Cont.)	N/A	Roller bit borehole to ~7" dia using water to dr. 11. (WL @ 12.3' BGS after pumping ~~drill~~ casing water out of hole & waiting 15 min. prior to roller bit dr. 11ing)
	21.0			21.0		
				Box 4 of 4		
		21.4		21.4		
		End coring @ 21.4' BGS				
	22.0	Sandstone, f-m grained, 7/N lt gray, dry.	0.0 ppm	N/A	N/A	Water w/ roller bit not working due to no circulation. Begin air rotary to ream out borehole on 08/24/99.
	23.0					Rig breakdown 08/24/99 @ 1600 @ 32' BGS.
						Cont. air rotary after rig repair. 10/21/99 @ 1345. Cont. @ 32.0' BGS.
	24.0		0.0 ppm	N/A	N/A	Air rotary through ~~after~~ uncored rock advancing ~ 1' per 10 min.
	25.0					
	26.0		0.0 ppm	N/A	N/A	
	27.0					
	28.0		0.0 ppm	N/A	N/A	
	28.5					
	29.0					
	30.0		0.0 ppm	N/A	N/A	

PROJECT: RVAAP, LL1 Phase II RI | HOLE NO: LL-MW-85

DRILLING LOG

PROJECT: RVAAP, LLI, Phase II RI | INSPECTOR: M. Vest | HOLE NUMBER: LLI-mw-85 | SHEET: 5 of 5

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)
	31.0	Sandstone, f-m gr., 7/N lt. gray, dry to moist.	0.0 ppm	N/A	N/A	Cont. air rotary @ 32.0' BGS on 08/21/99. No water blown w/ air w.c. prior to drilling @ 31.7' BGS.
	32.0		0.0 ppm	N/A	N/A	
	33.0					
	34.0		0.0 ppm	N/A	N/A	
	35.0					
	36.0		0.0 ppm	N/A	N/A	
	37.0					
	38.0		0.0 ppm	N/A	N/A	
	39.0					
	40.0	Cuttings wet below ~40.0' BGS, when cuttings return is present.	0.0 ppm	N/A	N/A	At 40.0' BGS can hear water in borehole being blown by air. No wet cuttings or water @ surface from air return.
	41.0					
	42.7		0.0 ppm	N/A	N/A	WL @ 35.5' BGS.
	43.0					
	44.0		0.0 ppm	N/A	N/A	
	45.0	45.0				
		End drilling @ 45.0' BGS				End air rotary @ 45.0' BGS. Total amount of water ~~injected/used~~ used for coring/drilling was ~~N/A~~ 0 gal. N 562046.245 E 2377246.938

PROJECT: RVAAP, LLI, Phase II, RI | HOLE NO: LLI-mw-85

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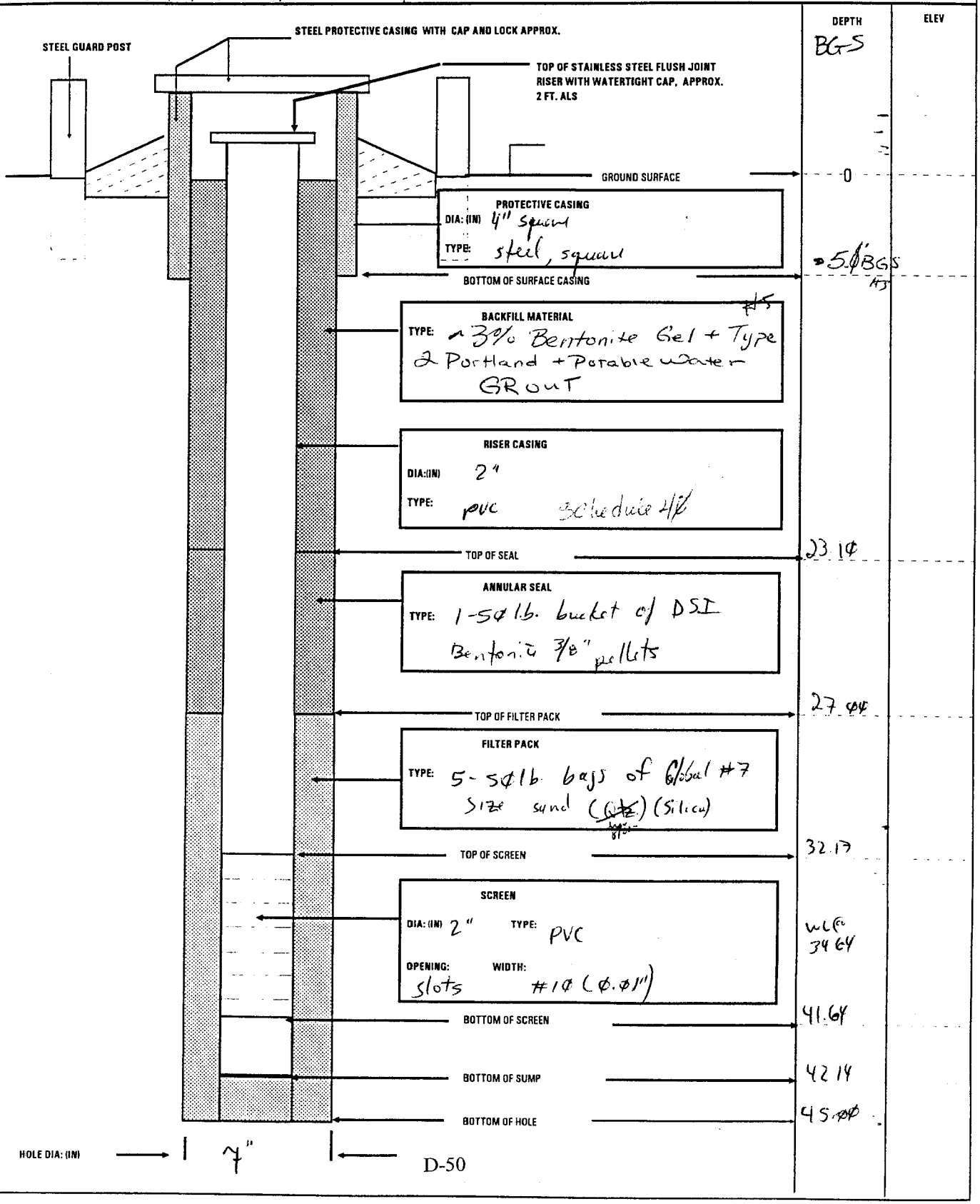
MONITORING WELL

PROJECT NAME: Load Line 1 Phase II RI **DELIVERY ORDER NO:** 003

WELL NUMBER: ~~LL1-MW-85~~ LL1-MW-85	**BEGIN:** 08/23/99	**END:** 08/23/99
COORDINATES: N: 562046.245 E: 237246.938	**REFERENCE POINT:** TOC	**ELEVATION:** 996.94 MSL Ft



Load Line 1 Phase II RI
Monitoring Well Installation Logs

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HTRW DRILLING LOG

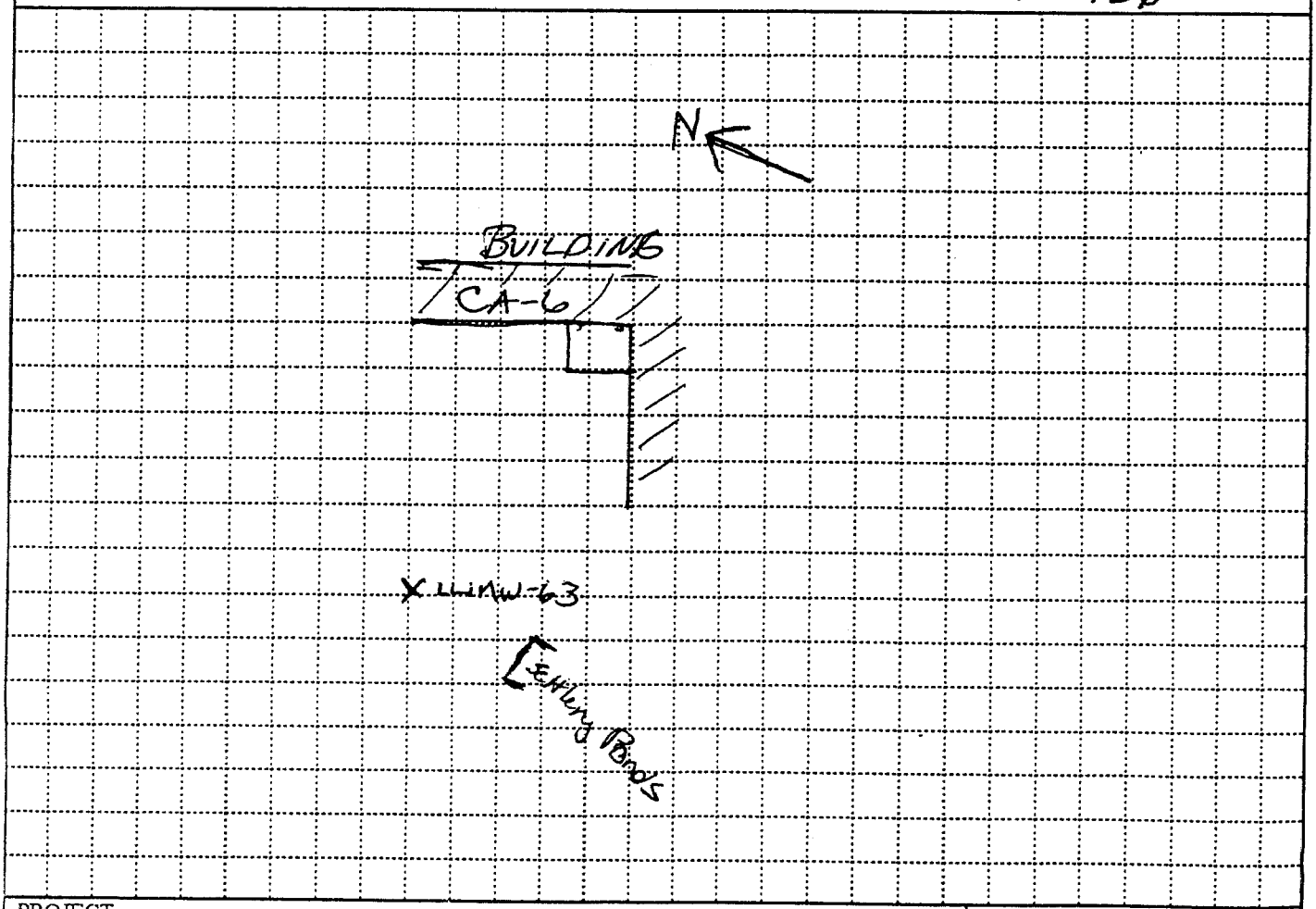
DISTRICT: Nashville		HOLE NUMBER: LLIMW-63
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Alliance Environmental	SHEET 1 OF 4
3. PROJECT: RVAAP	4. LOCATION: Load Line 1 - RVAAP	
5. NAME OF DRILLER: Dave Newman	6. MANUFACTURERS DESIGNATION OF DRILL: CME-55	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: CME 55 ATV 6¼ in ID Hollow stem augers w/ 2¼ log / 2in diameter split spoon — 6¼ in diameter tricone bit for air rotary using an Ingersol Rand 375 air compressor	8. HOLE LOCATION: SEE SKETCH BELOW	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 7/27/96	11. DATE COMPLETED: 7/30/96
12. OVERBURDEN THICKNESS: 3.1 ft BGS	15. DEPTH GROUNDWATER ENCOUNTERED: 19 ft	
13. DEPTH DRILLED INTO ROCK: 27.4 ft BGS	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 19.88 ft BGS on 7/31/96 @ 1000	
14. TOTAL DEPTH OF HOLE: 27.4 ft BGS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
NA	NA	NA	NA	NA	NA	100

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Monitoring well	NO	LLIMW-63	NO	Susan J Alston

LOCATION SKETCH/COMMENTS — SCALE: 1" = 100'



PROJECT	HOLE NO.
RVAAP 00 #0022	LLIMW-63

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: LLIMW-63

PROJECT: RVAAP DO# 0022 | INSPECTOR: S.L. Abston | SHEET: 2 of 4

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D) OVM	BLOW COUNTS (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)	
							0
	0.3	CL, sandy silty clay, med plastic soft, dry, 2.5Y 4/2 dark grayish brown topsoil		3	3	Recovery @ 1633 1.0 ft/2.0 ft	
	0.5	SW, sand, loose, dry, 10YR 6/4 light yellowish brown w/ sandstone frag.	0.0	12			
		SW, Sand w/ rock frag + gravel, loose, dry, 7.5YR 3/1 very dark grey, Rocks consist of sandstone and slag frag. Poss. 1.0 loss		14 / 13 / 7	SW 7/12/96 NA / 7		
		CL, silty (~30%) clay med. plastic, very stiff 10YR 6/1, gray mottled with 10YR 4/4 dark yellowish brown, dry		5		Split Spoon Refusal at 3.1 ft BGS	2
		Weathered fine to med grain sandstone, SW 7.5YR 6/2 pinkish grey to 10YR 6/4 light yellowish brown	0.0 ppm	11 / 50/2		Recovery @ 1715 1.1 ft/1.1 ft	
						Augering w/ center stem, no split spoon	
				NA	NA	Augering through weathered sandstone	4
				↓	↓	Auger Refusal at 4.5 ft BGS. Adding 6¼ in tricone bit to air rotary sandstone	
		Fine grain, well graded sand SW, dry, softer than above		↓	↓		
		Fine grain, SP sandstone, sand dry, 10YR 6/4 light yellowish brown mottled w/ 10YR 6/6 brownish yellow, Not uniform sizes - may be weathered or fractured	0.0 ppm	↓	↓	Add another rod	7.0

PROJECT: RVAAP | HOLE NO. LLIMW-63

HTRW DRILLING LOG

HOLE NUMBER LLMW-63

PROJECT RVAAP | INSPECTOR S.L.Absten. | SHEET 3 of 4

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS OVA (D)	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
			0.0 ppm	NA	NA	
	1		0.0 ppm			
	15	SW, fine grain, some gravel, slightly damp, 10YR/5/6 yellowish brown with some larger rock fragments Prob weathered fractured zone				Rattly drilling
	16	Returned to c SP, fine grain sand, dry 10YR 6/4 light yellowish brown	0.0 ppm			
	17.2	SW, fine grain sand, slightly damp, 10YR6/8 brownish yellow with weathered, angular sandstone frag.				Auger Cuttings Resist layer
	17.9	SP, fine grain sand, 10YR6/4 light yellowish brown				Less resistant drilling
						Water stabilized at 19 ft BGS

PROJECT RVAAP | HOLE NO. LLMW-63

HTRW DRILLING LOG

HOLE NUMBER LL1MW-63
SHEET 4 of 4

PROJECT RVAAP DO #0022 INSPECTOR S.L. Abbott

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D) OVA	GEOTECH SAMPLE OR CORE BOX NO (E)	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		same as above	0.0 ppm		NA	Adding rod at 22 ft BGS. * pulling up to let borehole set open to check for water (241)
	22	Fine to med. grained sandstone, moist, 10YR 7/4 very pale brown w/ mercasing fragments of 2 7/1 light brown grey sand, weathered	0.0 ppm			At 0639 7/29/96 3.17 ft of water in borehole. Drilling an additional 5 ft Rotty drilling
	22.5	same as above w/ less larger fragment				
	26	Increase in larger fragments	0.0 ppm			Rotty drilling
						Stop drilling @ 27.4 ft BGS to set well
						Field Reading with Mini Rae # 000617 and MX 251 LEL/ O2 meter #2330 (Hazco

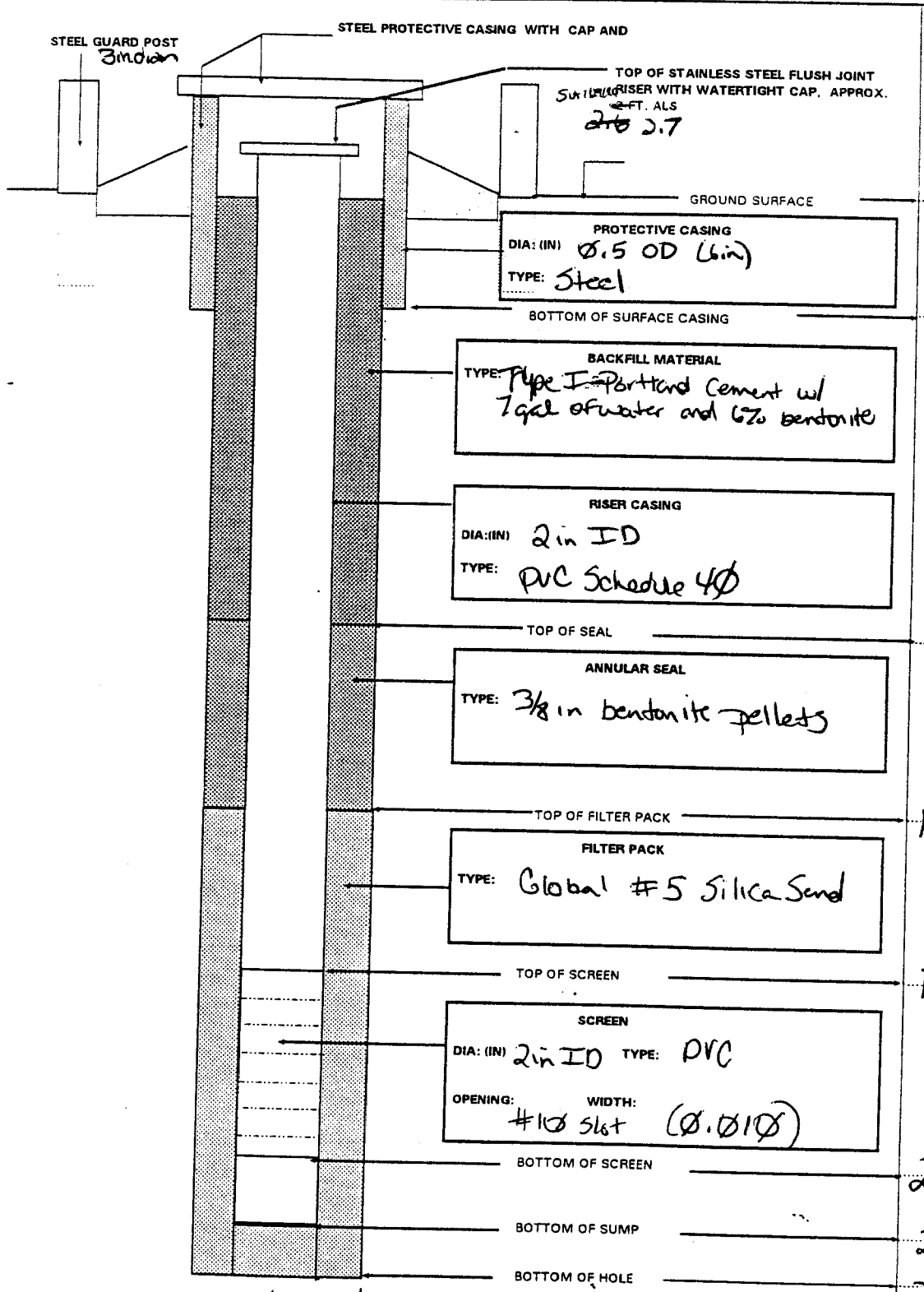
PROJECT RVAAP HOLE NO. LL1MW-63

MONITORING WELL

PROJECT NAME: RVAAP

DELIVERY ORDER NO: 0022

WELL NUMBER: LLI MW-63	BEGIN: 7/29/96	END: 7/29/96
COORDINATES: N: E:	REFERENCE POINT: MSL	ELEVATION:



	DEPTH	ELEV
GROUND SURFACE	0	
BOTTOM OF SURFACE CASING	5.Ø	
TOP OF SEAL	8.9	
TOP OF FILTER PACK	12.9	
TOP OF SCREEN	17.1	
BOTTOM OF SCREEN	27.1	
BOTTOM OF SUMP	27.4	
BOTTOM OF HOLE	27.4	

HTRW DRILLING LOG

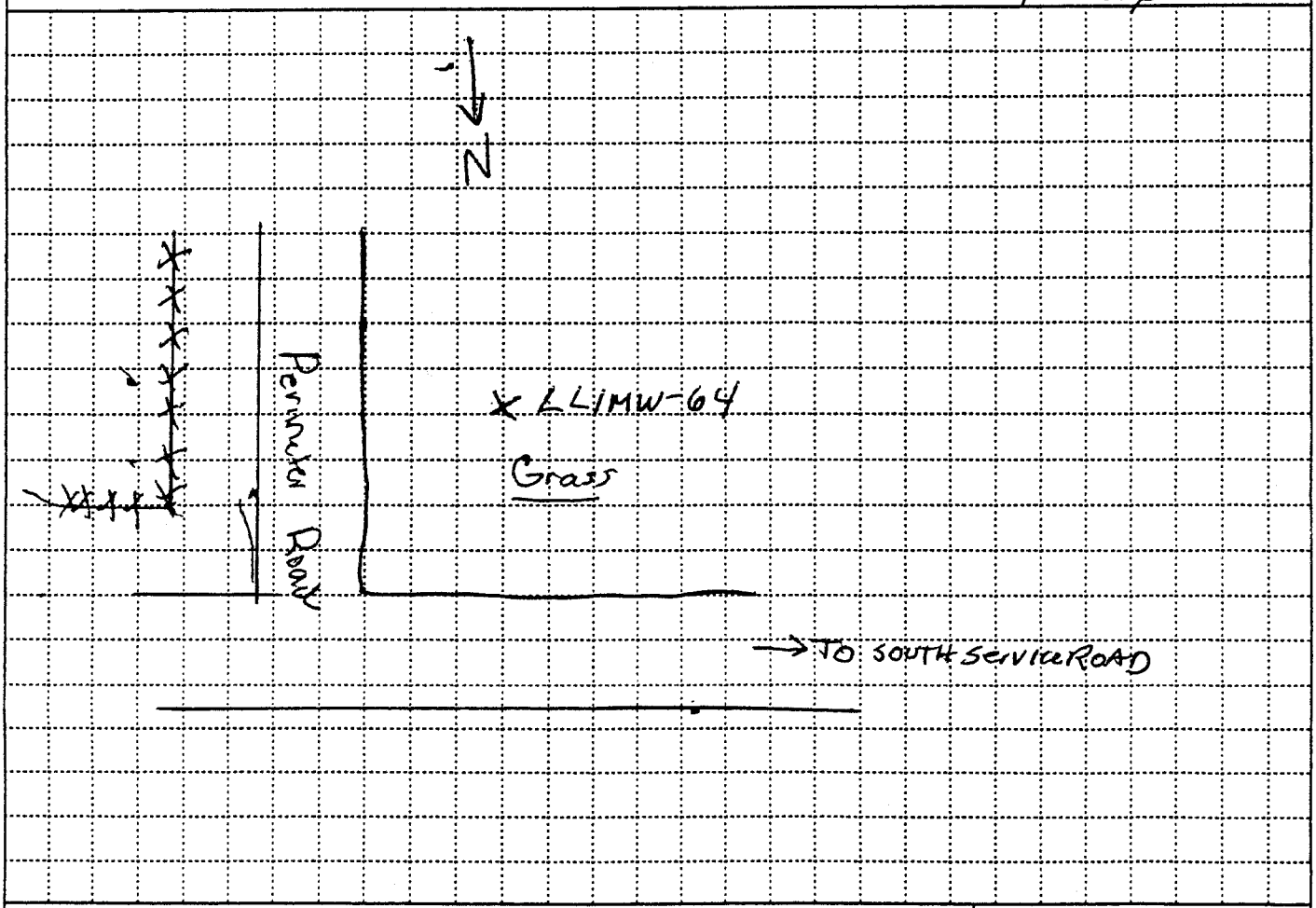
1. COMPANY NAME: SAIC	DISTRICT: NASHVILLE	HOLE NUMBER: LL/MW-64
2. DRILL SUBCONTRACTOR: Alliance Environmental		SHEET 1 OF 3 SHEETS
3. PROJECT: 3rd 123rd RAA · RVAAP	4. LOCATION: Load Line 1 Ravenna Army Ammo. Plant	
5. NAME OF DRILLER: James Bennett	6. MANUFACTURERS DESIGNATION OF DRILL: CME-55	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: CME 55, 6 5/8" ID Hollow stem Augers w/ 2 ft. 3in diameter split spoons	8. HOLE LOCATION: SEE SKETCH BELOW	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 7/23/96	11. DATE COMPLETED: 7/23/96
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 6.3 ft BGS	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 3.03 BTOC 7/29/96 @ 1335	
14. TOTAL DEPTH OF HOLE: 18 ft	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 3.02 BTOC 7/30/96 @ 1321	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
NA	NA	NA	NA	NA	NA	79

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
M.W. Installed	NA	7/23/96	NA	Duskin J Clayton

LOCATION SKETCH/COMMENTS — SCALE: 1" = 20'



PROJECT	HOLE NO.
RVAAP 00#0022	LL/MW-64

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER LLMW-064
SHEET 2 of 3

PROJECT RVAAP | INSPECTOR SLA 7/23/94 SLA Osten

ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D) PVA	GEOTECH SAMPLE OR CORE BOX NO ~~or RT~~	ANALYTICAL SAMPLE NO (F)	REMARKS (G)
		SC, Silty Sand, loose, topsoil 10YR 4/2 dark grey with brown, dry 0.4	0.0 ppm	Blow Counts	NA	Rec: 1.5 ft / 2.0 ft
		SM, Gravelly sand, med grain size medium dense, dry 2.5Y 7/4 pale yellow mottled with 10YR 7/4 very pale brown 1.6		3-13-11-7		NO SAMPLES COLLECTED FROM BOREHOLE
		CL, sandy clay, medium plastic, soft, 10YR 4/1 dark grey mottled w/ 10YR 4/3 brown				2.0 Rec = 1.6 ft / 2.0 ft
		Clay - CL, high plastic, dry soft, 10YR 5/1 grey mottled with 10YR 4/3	0.0 ppm	~~3-5-9-12~~ SLA 4-4-6-10	NA	SLA 7/23/94
			0.0 ppm	3-5-9-12	NA	4.0 Rec 1.4 ft / 2.0 ft
		CL, Sandy clay, low plastic soft, damp, 10YR 5/2 greyish brown mottled with 10YR 5/4 yellowish brown with subrounded pebbles 5.6				6.0
		SM Gravelly sand with silt, coarse grain, loose, wet 10YR 5/2 greyish brown	0.0 ppm	5-6-6-8	NA	Rec 1.3 ft / 2.0 ft WATER at ≈ 6.3 ft BGS (0.7 ft of last recovery probably out of bottom of spoon)
		CL, clay, high plastic very stiff, dry, 10YR 4/1 dark grey 8.2	0.0	4-7-11-18	NA	8.0 Rec 1.4 ft / 2.0 ft
						10.0

PROJECT RVAAP | HOLE NO. LLMW-064

HTRW DRILLING LOG

HOLE NUMBER LLMW-064
SHEET 3 of 3

PROJECT RVAAP
INSPECTOR S. Alston

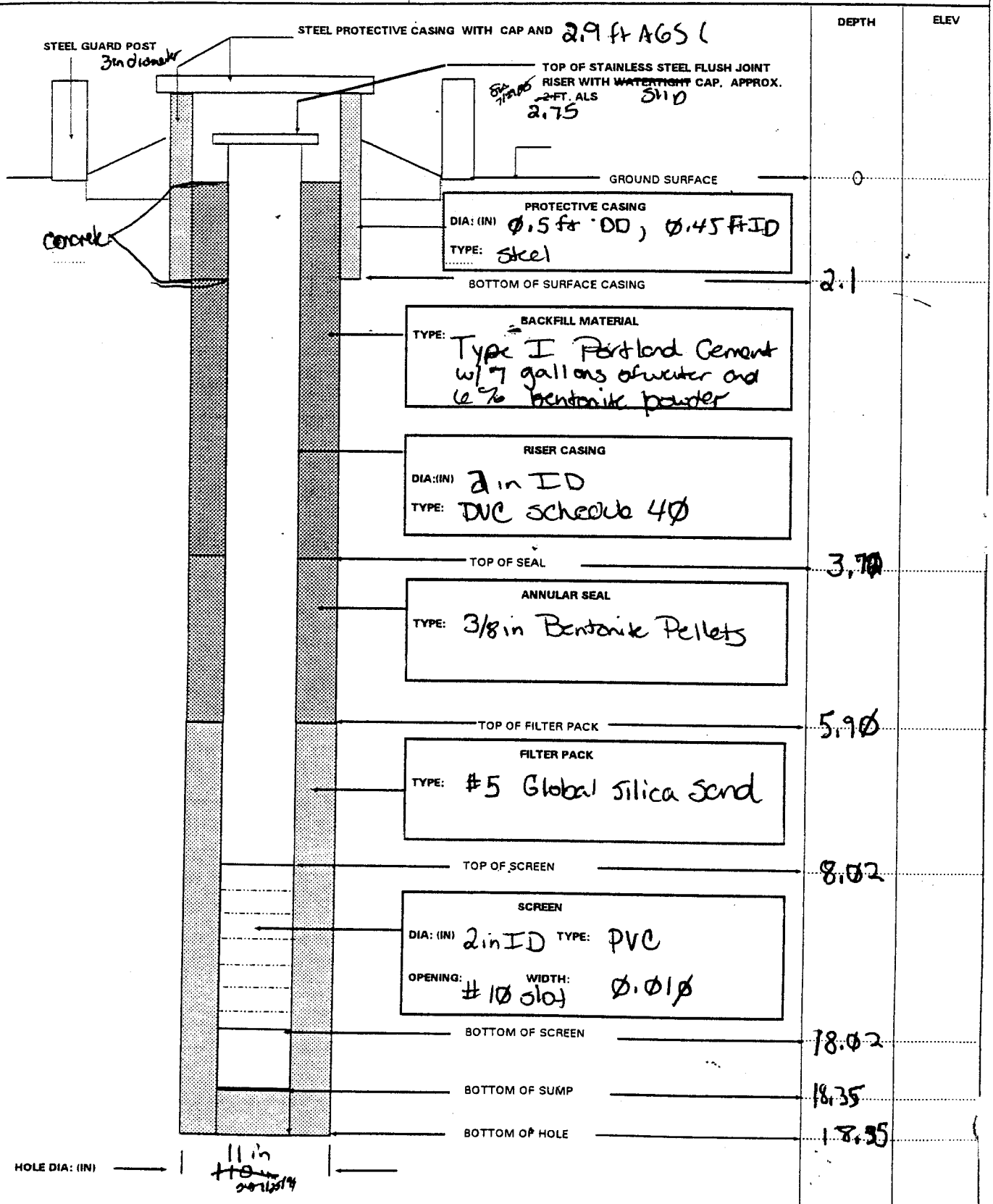
ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
		SP, fine grain sand, loose, saturated, 10YR5/1 grey	OVA	Blow counts	NA	Recovery: 1.8 ft/2.0 ft
		BG SW Grades to a coarse grain sand, saturated	0.0 ppm	1-3-6-8		
			0.0 ppm	4-3-4-9	NA	12.0 Recovery: 1.4 ft/2.0 ft
		CL, clay, high plastic, very stiff, damp, 10YR5/1 grey	0.0 ppm	5-8-11-14	NA	14.0 Recovery 1.8 ft/2.0 ft
		SP, Fine to med grained sand, loose, saturated 10 YR5/1 grey				
			0.0 ppm 0.7 (from auger) ppm	3-5-7-12	NA	16.0 Recovery 2.0 ft/2.0 ft Having trouble w/ sands coming up in the augers
		CL, Clay, high plasticity, very stiff, 10YR5/1 Grey, lense				18.0
						Stopped drilling at 18 ft BGS - Setting well Field Readings with Mini Rae # 000617 and MX 251 LEL/O2 meter # 2330 (Hazco)

PROJECT RVAAP D.O. # 0022
HOLE NO. LLMW-064

MONITORING WELL

PROJECT NAME: RVAAP | DELIVERY ORDER NO: 0022

WELL NUMBER: LL1 MW-Ø64	BEGIN: 7/23/96	END: 7/25/96
COORDINATES: N: E:	REFERENCE POINT: MSL	ELEVATION:



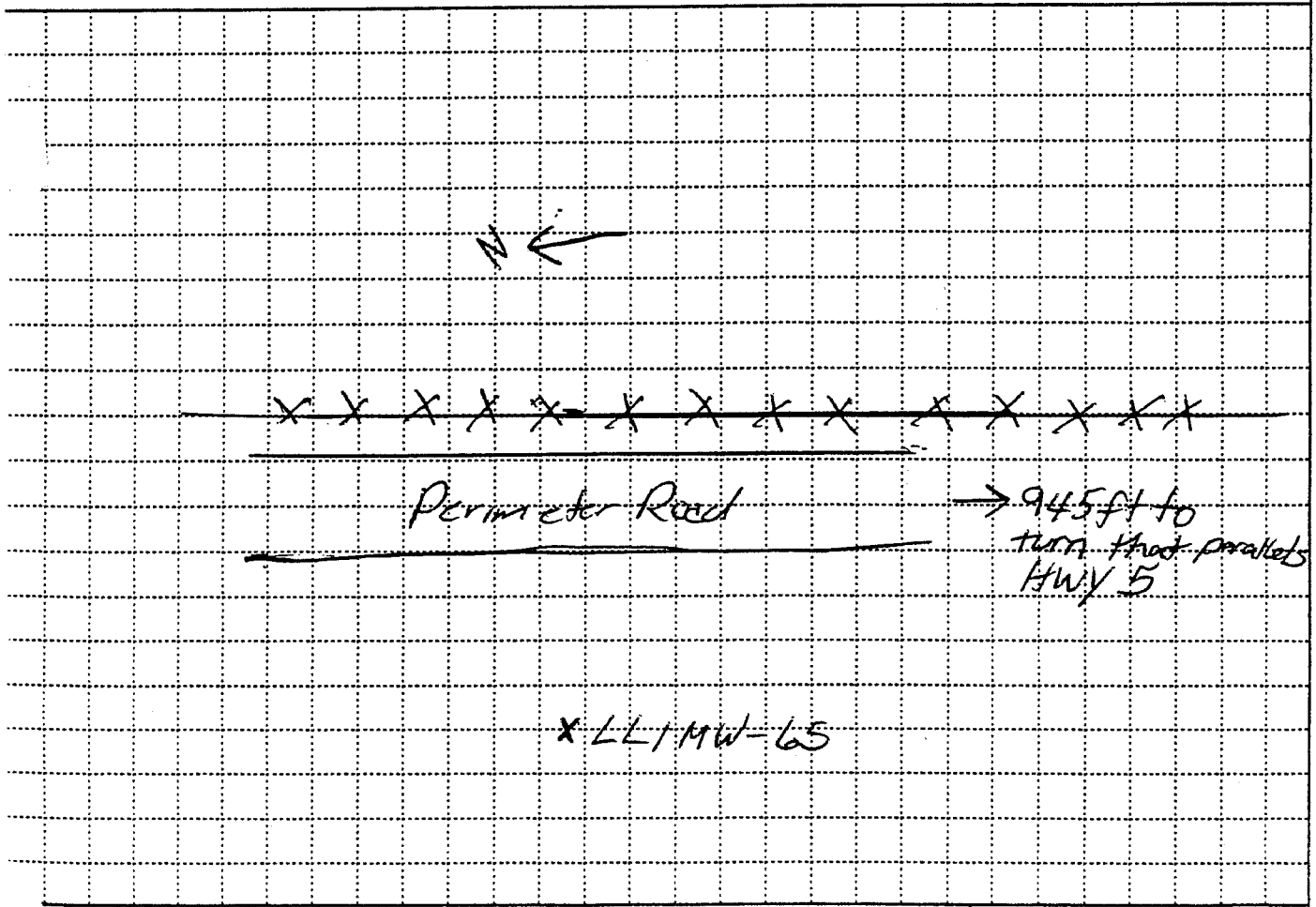
DEPTH | ELEV

HTRW DRILLING LOG

DISTRICT: Nashville		HOLE NUMBER: LL1 MW-065
1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: Allidnee Environmental	SHEET 1 OF 3
3. PROJECT: RVAAP	4. LOCATION: Load Line 1, RVAAP	
5. NAME OF DRILLER: James Bennett	6. MANUFACTURERS DESIGNATION OF DRILL: CME 55	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: CME 55, 6 5/8 in ID Hollow Stem Augers with 2 ft - 2 in diameter split spoons	8. HOLE LOCATION: See Sketch Below	
	9. SURFACE ELEVATION	
	10. DATE STARTED: 7/24/96	11. DATE COMPLETED: ~~7/24~~ 7/24/96
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 14.2	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 10.28 (7/28/96) ft BGS	
14. TOTAL DEPTH OF HOLE: 20.5	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): 10.33 ft BGS 7/30/96 @ 1629	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES			
NA	NA	NA	NA			
20. SAMPLES FOR CHEMICAL ANALYSIS	**VOC**	**METALS**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**OTHER (SPECIFY)**	**21. TOTAL CORE RECOVERY %**
NA	NA	NA	NA	NA	NA	95
22. DISPOSITION OF HOLE	**BACKFILLED**	**MONITORING WELL**	**OTHER (SPECIFY)**	**23. SIGNATURE OF INSPECTOR**		
NA	NA	NA	NA	Susan J Alston		

LOCATION SKETCH/COMMENTS — SCALE:



DJECT	HOLE NO.
RVAAP	LL1 MW-065

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: LL1 MW-Ø65
SHEET: 2 of 3

PROJECT: RVAAP
INSPECTOR: S.L. Abston 5 or 7/24/96

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)
	Ø.3	3D, Silty/c/g fine grained sand, med brnsh, 10YR4/2 dark grayish brown with rootlets (Top soil)	1.7 ppm	BLOW COUNTS: 3, 11, 4, 11	NA	Recovery 1.3 ft / 2.Ø ft Field readings with Mini Rae ## ØØ ØL67 and MX251 LEL/O2 meter #2330 CHemco
		CL - sandy clay, low plastic, firm, 10YR6/3 pale brown mottled with 7.5YR6/8 reddish yellow dry prob. Ø.7 loss				
		same as above but also mottled w/ 10YR6/3 pale brown, dry	3.8 ppm	8, 14, 17, 19	NA	Recovery 1.1 ft / 2.Ø ft 2.6 At 2.Ø BGS Borehole reading of 17.8 ppm Breathing zone of 2.7 ppm At 4.Ø BGS Borehole reading of Ø.7 ppm and Breathing zone of Ø.1 ppm
		prob. Ø.9 loss				
	4.Ø	- gradational - - -				4.Ø
		CL - silty clay, low plastic, hard 10YR6/3 pale brown mottled with 10YR6/3 pale brown with small small rock frag. dry	Ø.Ø ppm	6, 15, 21, 24	NA	At 2.Ø BGS 7/24/96 Borehole reading of 17.8. Breathing zone reading of 2.7 ppm Breathing zone Ø.1 ppm at 4-6 ft BGS Recovery 1.2 ft / 2.Ø ft
		prob Ø.8 loss				
	6.Ø					6.Ø
		becoming mottled w/ 7.5YR 5/6 strong brown iron	Ø.Ø ppm	9, 17, 26, 45	NA	Recovery 1.4 ft / 2.Ø ft Inside Auger OVA reading of 33 ppm Breathing Zone Ø.1 ppm At 6.Ø BGS
		prob Ø.6 ft loss				
	8.Ø	- - Gradational - - -				8.Ø
		CL, mod to high plastic, hard, dry, 10YR5/3 brown with <1% small sub angular rock fragments	Ø.Ø ppm	8, 16, 26, 32	NA	Recovery 2.0 ft / 2.Ø ft
						10.Ø

PROJECT: RVA AP
HOLE NO.: LL1 MW-Ø65

HTRW DRILLING LOG

HOLE NUMBER: LLMW-65
PROJECT: RVAAP
INSPECTOR: Blowcounts S.L. Hostetter
SHEET: Pg 3 of 3

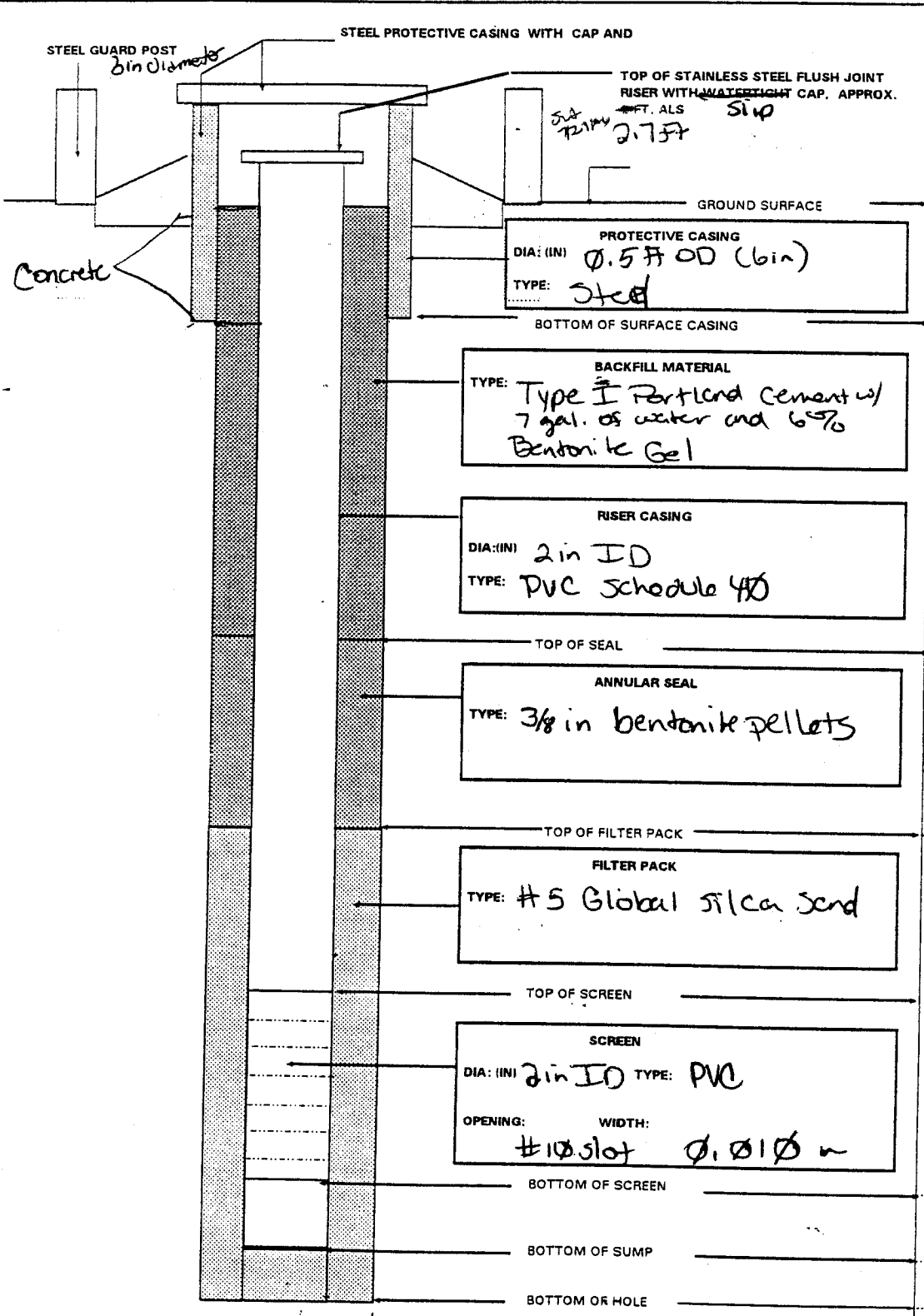
ELEV (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GEOTECH SAMPLE OR CORE-BOX NO. (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
			ØNA	Sta 7/29/96		
				17		Recovery 2.Ø / 2.Ø
			Ø.Ø ppm	14	NA	
				19		
	11.3	CL, clay, high plastic, firm, slightly damp 10YR5/1 grey		19		
			Ø.Ø ppm	2	NA	Recovery 2.Ø/2.Ø
				4		
				4		
				7		
		SP, Silty, fine grain, loose, wet sand, loose, 10YR5/4 yellowish brown				
	14.2					
		SW, med. grained, loose, saturated sand 10YR5/3 brown		4		Recovery 2.Øft/2.Øft
			Ø.Ø ppm	2	NA	Water at 14.2 ft BGS
				32		1.5 ft of sand comes into the auger
				63		
				1		> at 16.Ø ft BGS
			Ø.Ø ppm at borehole	2	NA	Recovery Øft/2.Ø
				3		2.5 ft of sand in auger when preparing to drive the 18-20 ft spoon Pulling spoon auger to flush sand
				6		
				3		1.9ft/2.Øft Recovery
			Ø.Ø	3		
				2		
		SW, fine to med grained loose sand, saturated, 10YR5/1, grey		3		Boring terminated at 2Ø ft to install monitoring well
		▽ poss. lost Ø.1 ft				Tagged at 20.5 ft BGS

PROJECT: RVAAP
HOLE NO.: LLMW-65

MONITORING WELL

PROJECT NAME: RVAAP **DELIVERY ORDER NO:** 0022

WELL NUMBER: LL1MW65	BEGIN: 7/24/96	END: 7/25/96
COORDINATES: N: E:	REFERENCE POINT: MSL	ELEVATION:



HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DRILL SUBCONTRACTOR: AEI	DISTRICT: NASHVILLE
		HOLE NUMBER: LL1MW67
		SHEET 1 OF 4 SHEETS

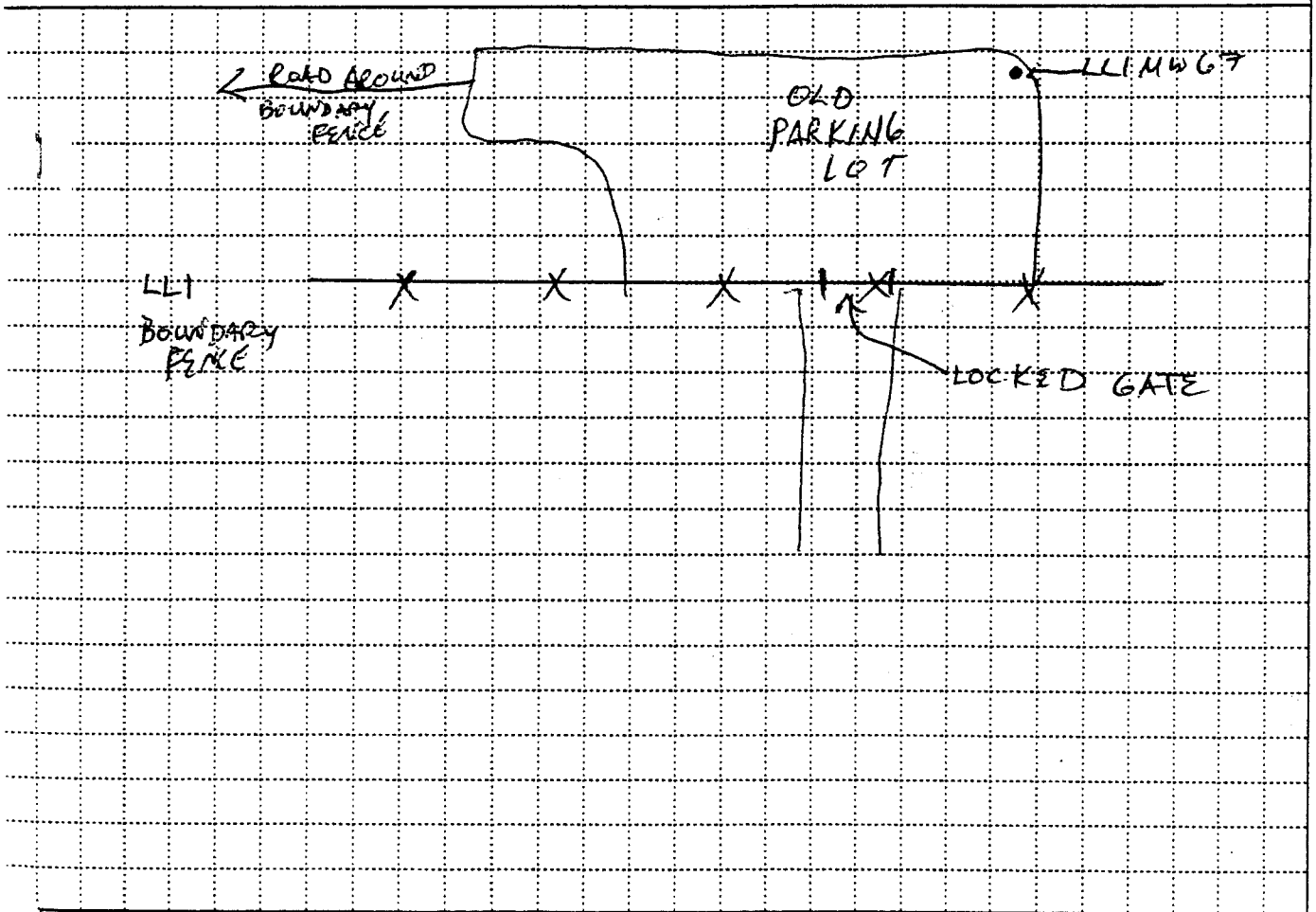
3. PROJECT: RVAAP	4. LOCATION: LL1 AREA @ RVAAP Ravenna, OH.
5. NAME OF DRILLER: DAVE NEWMAN	6. MANUFACTURERS DESIGNATION OF DRILL: MOBILE B-61 HDX
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Mobile B-61 HDX, 5 7/8" tri-cone roller bit, 6 5/8 in HS Augers, Ingersoll Rand 375 Air Compressor, 2" steel split spoons, & safety driving hammer.	8. HOLE LOCATION: LL1 OUTSIDE OF FENCE.
	9. SURFACE ELEVATION:
	10. DATE STARTED: 12 AUG 96 / 11. DATE COMPLETED: 13 AUG 96
12. OVERBURDEN THICKNESS: 5.7 FT BGS	15. DEPTH GROUNDWATER ENCOUNTERED: 18.4 FT BGS
13. DEPTH DRILLED INTO ROCK: 17.7 FT BGS	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED:
14. TOTAL DEPTH OF HOLE: 23.4 FT BGS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
NA	NA	NA	NA	NA	NA	NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
MW INSTALLED	NA	INSTALLED	NA	Matthew B. Vest

LOCATION SKETCH/COMMENTS — SCALE: NOT TO SCALE



PROJECT	HOLE NO.
RVAAP	LL1MW67

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

LL1 MW67

RVAAP | Inspector: Matthew B. Vest | Sheet 2 of 4

	Depth	Description of Materials	Field Screening Results	Blow Counts	Analytical Sample No.	Remarks
	0.7	TOPSOIL w/ ROOTS	0.0 ppm	4 50/2	NA	0.7' Rec out of 0.7 Breathing Zone (BZ) 0.0 ppm Borehole 0.0 ppm @ 0.7
	2.5	f.-m. grained SANDSTONE, ~~dry~~ very slightly damp, 10YR 6/8 brownish yellow, weathered & broken up. NO SAMPLE TAKEN, ONLY DRILL CUTTINGS.	NA	NA	NA	Spoon Refusal @ 0.7' BZ 0.0 ppm Borehole 0.0 ppm Auger without Sampling to 2.5 ft BGS. ~~Spoon Refusal @ 2.5~~ Auger @ 2.5
	3.2	ML, SILT w/ CLAY, low plasticity, loose, ~~dry~~ very slightly damp, dry, 2.5 Y 4/4 olive brown, mottled w/ 2.5 Y 5/1 gray, w/ occasional black organic specs	5.7 ppm very slightly elevated NA	3 6 50/2	NA	0.7' Rec out of 0.7' BZ 0.0 ppm Borehole 0.0 ppm 3.2
	4.0	NO SAMPLE TAKEN	NA	NA	NA	Spoon Refusal @ 3.2' Auger, No Sampling. 4.0
	5.7	WEA. f. to Med. grained SANDSTONE, interbedded w/ ~~silty~~ very slightly clayey SILT, low plasticity, loose, dry, 2.5 Y 4/4 olive brown. Loss of 1.2 FT.	0.0 ppm	34 42 38 50/2	NA	0.5' Rec out of 1.7' BZ @ 0.0 ppm Borehole @ 0.0 ppm 5.7
	10.0	TOP OF ROCK @ 5.7 FT BGS f.-m. grained SANDSTONE, 10YR 7/4 v. pale brown, sl. damp.	0.0 ppm	NA	NA	Spoon Refusal @ 5.7' Auger to 5.5 FT BGS & Begin Air Rotary @ 5.5 FT BGS. Checking BZ & Borehole w/ Mini Rae Model PGM-75 Serial # 200 167 & O_2 LEL MX25 Serial # O_2 @ 600 3-160 Driller feels that @ competant rock @ 5.7 FT BGS. had 15 000 lbs trying to drill deeper. BZ ~~& Borehole~~ @ 0.0 ppm. 10.0

PROJECT: RVAAP | HOLE NO: LL1MW67

64

HTRW DRILLING LOG

LL MW67

RVAAP | INSPECTOR MATTHEW B. VEST | SHEET 3 of 4

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS	FIELD SCREENING RESULTS	OVM TYPE AND READINGS (IN BREATHING ZONE)	ANALYTICAL SAMPLE NO.	REMARKS
	10.0					10.0
		SAME AS ABOVE	0.0 ppm	NA	NA	BZ @ 0.0 ppm
12.0						
		SANDSTONE, f-m. grained, 10YR 7/4 V. pale brown, damp.	0.0 ppm			BZ @ 0.0 ppm
			0.0 ppm			BZ @ 0.0 ppm
			0.0 ppm			BZ @ 0.0 ppm
18.4						
		SANDSTONE, f-m. grained, 10YR 7/4 V. pale brown, wet.	0.0 ppm			Hit first WATER @ 18.4 FT BGS
						BZ @ 0.0 ppm
20.0						20.0

PROJECT RVAAP | HOLE NO. LL/MW67

65

HTRW DRILLING LOG

PROJECT RVAAP	INSPECTOR MATHEW B. VEST	HOLE NO. LLIMW67	SHEET 4 of 4

FILE	DEPTH	DESCRIPTION OF MATERIALS	FIELD SCREENING RESULTS	GEOTHERMOMETER BLOWECLIND	ANALYTICAL SAMPLE NO.	REMARKS
	20.4					20.4
		SAME AS ABOVE	Ø.ØppM	NA	NA	BZ. @ Ø.Ø ppm
	23.4					23.4
		END OF DRILLING @ 23.4 FT BGS.				STOP DRILLING @ 23.4 FT BGS TO SEE IF BOREHOLE MAKES ENOUGH WATER.

PROJECT RVAAP

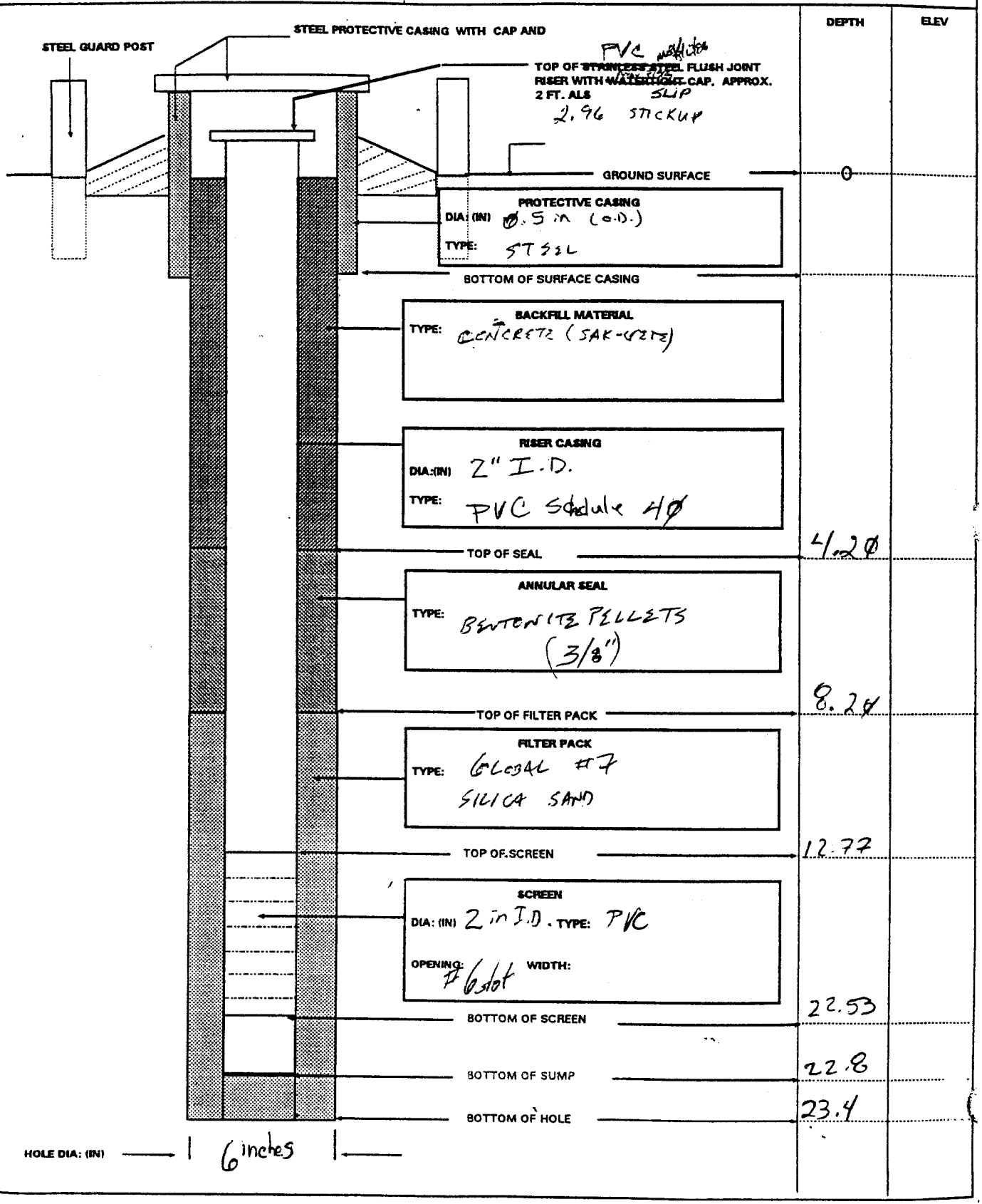
HOLE NO. LLIMW67

66

MONITORING WELL

PROJECT NAME: RVAAP DELIVERY ORDER NO: 0022

WELL NUMBER: LLI MW67	BEGIN: 12 AUG 96	END: 13 AUG 96
COORDINATES: N: E:	REFERENCE POINT: MSL	ELEVATION:



HTRW DRILLING LOG

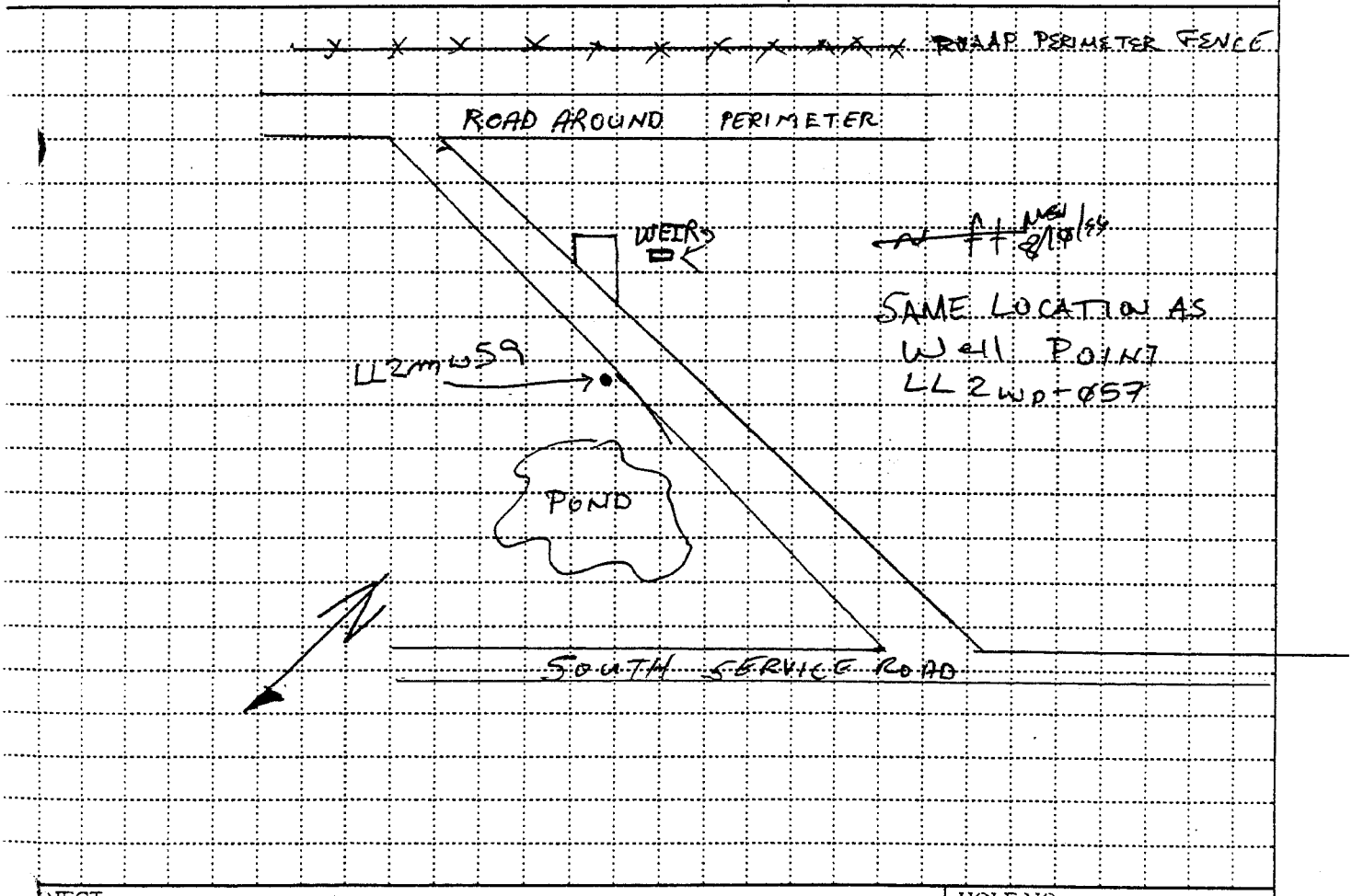
1. COMPANY NAME: SAIC	2. DISTRICT: NASHVILLE / 2. DRILL SUBCONTRACTOR: ALLIANCE ENVIRONMENTAL, INC	HOLE NUMBER: LL2mw59 / SHEET 1 OF 4
3. PROJECT: RVAAP	4. LOCATION: LL2 Area @ RVAAP, Ravenna, OH.	
5. NAME OF DRILLER: ~~ED ALLGER~~ Nov 8th '94 DAVE NEWMAN	6. MANUFACTURER'S DESIGNATION OF DRILL: MOBILE B-61 HDX	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 6 5/8 in HSA, Mobile B-61 HDX, 5 7/8 in Tri-Cone roller bit, air compressor; 2" steel split spoons, & Safety driving hammer.	8. HOLE LOCATION: S. of KELLY'S POND along rd. @ Well Pt. location LL2wp-057.	
	9. SURFACE ELEVATION:	
	10. DATE STARTED: 10 AUG 96	11. DATE COMPLETED: 11 AUG 96
12. OVERBURDEN THICKNESS: 7.7 FT BGS	15. DEPTH GROUNDWATER ENCOUNTERED: 14.5 FT BGS.	
13. DEPTH DRILLED INTO ROCK: 15.2 FT BGS.	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 1 hr @ 0 min later WL @ 10.2 FT BGS	
14. TOTAL DEPTH OF HOLE: 22.9 FT BGS	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	~~NA~~

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
NA	NA	NA	NA	NA	NA	NA

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
M.W. Installed.	NA	INSTALLED	NA	Matthew B. Vest

LOCATION SKETCH/COMMENTS: SAME LOCATION AS WELL PT., LL2 wp-057 SCALE: NOT TO SCALE



PROJECT	HOLE NO.
RVAAP	LL2mw59

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NO. LL2MW59

PROJECT RVAAP | INSPECTOR Matthew B Vest | SHEET 2 of 4

DEPTH	DESCRIPTION OF MATERIALS	FIELD SCREENING RESULTS	BLOW COUNTS	ANALYTICAL SAMPLE NO.	REMARKS
	TOPSOIL W/ ROOTS 0.4	0 0 ppm	4	NA	REC 1.4' out of 2.0'
	ML, SANDY SILT, low plasticity, loose, sl. damp, 10YR 5/4 yellowish brown.		6		Breathing zone (bz) 0-0 ppm. Borehole 0.0 ppm
			9		USING MINIRAE MODEL PGM-75 SERIAL #008167 & O_2 LEL 111X251 Serial # 9206083-160.
	probable loss of 0.6'				
2.0			4		2.0
	SM, SILTY SAND, low plas., loose, moist, 10YR 5/4 yellowish brown, w/ small rock fragments & sand grains up to 1/10 in. dia.	0.0 ppm	2	NA	REC 1.5' out of 2.0'
			3		Breathing zone (bz) 0.0 ppm
			4		Borehole 0.0 ppm.
	PROBABLE LOSS of 0.5'		11		
4.0					4.0
	4.9	0.0 ppm	4	NA	REC 1.5' out of 2.0'
	ML, CLAYEY SILT W/ SAND, low plas., medium density, sl. damp, 10YR 5/2 grayish brown, w specs of black organic material throughout.		11		BZ 0.0 ppm
			24		BOREHOLE 0.0 PPM
			23		
6.0	6.3				6.0
	SAME AS ABOVE, BUT NO BLACK ORGANIC SPECS.	0.0 ppm	6	NA	REC 1.7' out of 1.7'
			12		BZ 0.0 ppm
					BOREHOLE 0.0 ppm
	7.2		30		SPLITSPOON REFUSAL @ 7.7 FT BGS.
	fine to med. grained SANDSTONE, 10YR 6/2 lt. brownish gray, sl. damp, fractured. 7.7		42/0.2'		
8.0	NO RECOVERY / SPOON REFUSAL @ 7.7 FT BGS 8.0				8.0
	TOP OF ROCK @ 7.7 FT BGS.	NA	NA	NA	TRIED ANOTHER SPOON 8-10 FT BGS BUT REFUSAL @ 8 FT BGS. MINI RAE 0 ABOVE BACKGND.
	fine to med. gr. SANDSTONE, 10YR 6/2 brownish yellow, sl. damp.				AUGER WITHOUT SPOONS TO 10.0 FT BGS.
					VERY HARD & SLOW DRILLING. DRILLER THINKS WE ARE ON BEDROCK.
	END AUGERING @ 10.0 FT SWITCHING TO ROLLER BIT BGS.				10.0
10.0					

PROJECT RVAAP | HOLE NO. LL2MW59

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HTRW DRILLING LOG

LL2 mw 59

FROM: RVAAP | INSPECTOR: MATTHEW J. WEST | SHEET: 3 of 4

FT	DEPTH IN FT	DESCRIPTION OF MATERIALS	FIELD SCREENING RESULTS	GROUNDWATER ENCOUNTERED / WELL CONSTRUCTION COMMENTS	ANALYTICAL SAMPLE NO.	REMARKS
	10.0	fine to med. gr. SANDSTONE, 10YR6 Brownish yellow, sl. damp.	0.0 ppm	NA	NA	BEGIN DRILLING W/ TRI-CONE ROLLER BIT & AIR COMPRESSOR (AIR ROTARY) @ 10.0 FT BGS. BZ & HOLE @ 0.0 ppm
	14.5		14.5			14.5
		fine to med. gr. SANDSTONE 10YR 6/6 brownish yellow, wet.	0.0 ppm	NA	NA	HIT SOME WATER @ 14.5 FT BGS. Not large amount of water. BZ & HOLE @ 0.0 ppm
						Below 19.3 ft BGS DRILLING IS SLOWER, POSSIBLY HARDER ROCK BZ & HOLE @ 0.0 ppm
						19.3
						Water ~~was~~ more prevelant @ 19.3 FT BGS Good water @ this depth.
	20.0					20.0

PROJECT: RVAAP | HOLE NO.: LL2 mw 59

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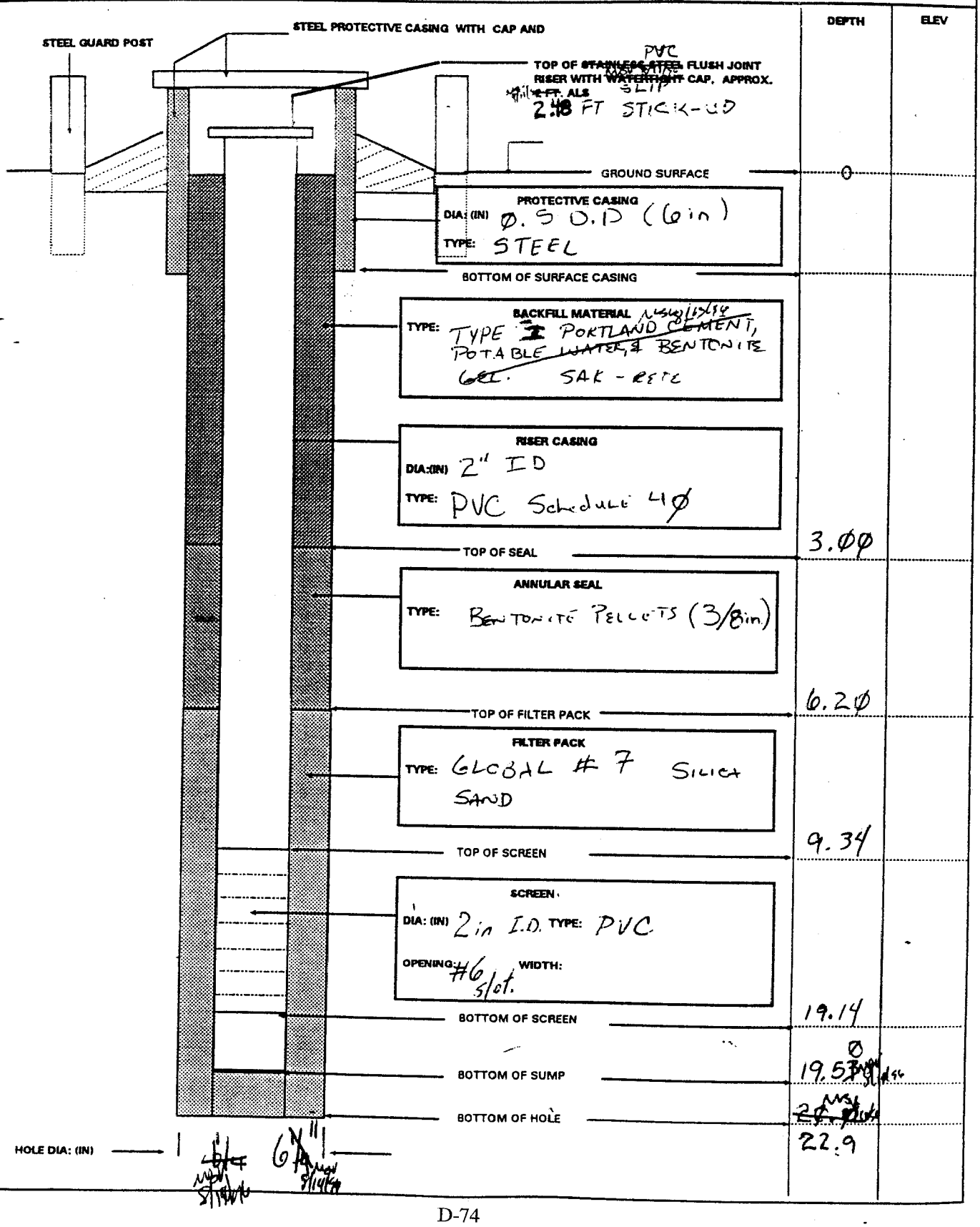
MONITORING WELL

PROJECT NAME: RVAAP | DELIVERY ORDER NO: 0022

WELL NUMBER: LL2mw59	BEGIN: 10 AUG. 96	END: 11 AUG. 96
COORDINATES: N: E:	REFERENCE POINT: MSL	ELEVATION:



HTRW DRILLING LOG

1. COMPANY NAME: SAIC	2. DISTRICT: NASHVILLE	HOLE NUMBER: LL2mw68
	3. DRILL SUBCONTRACTOR: ALLIANCE ENVIRONMENTAL, INC.	SHEET 1 OF 3 SHEETS

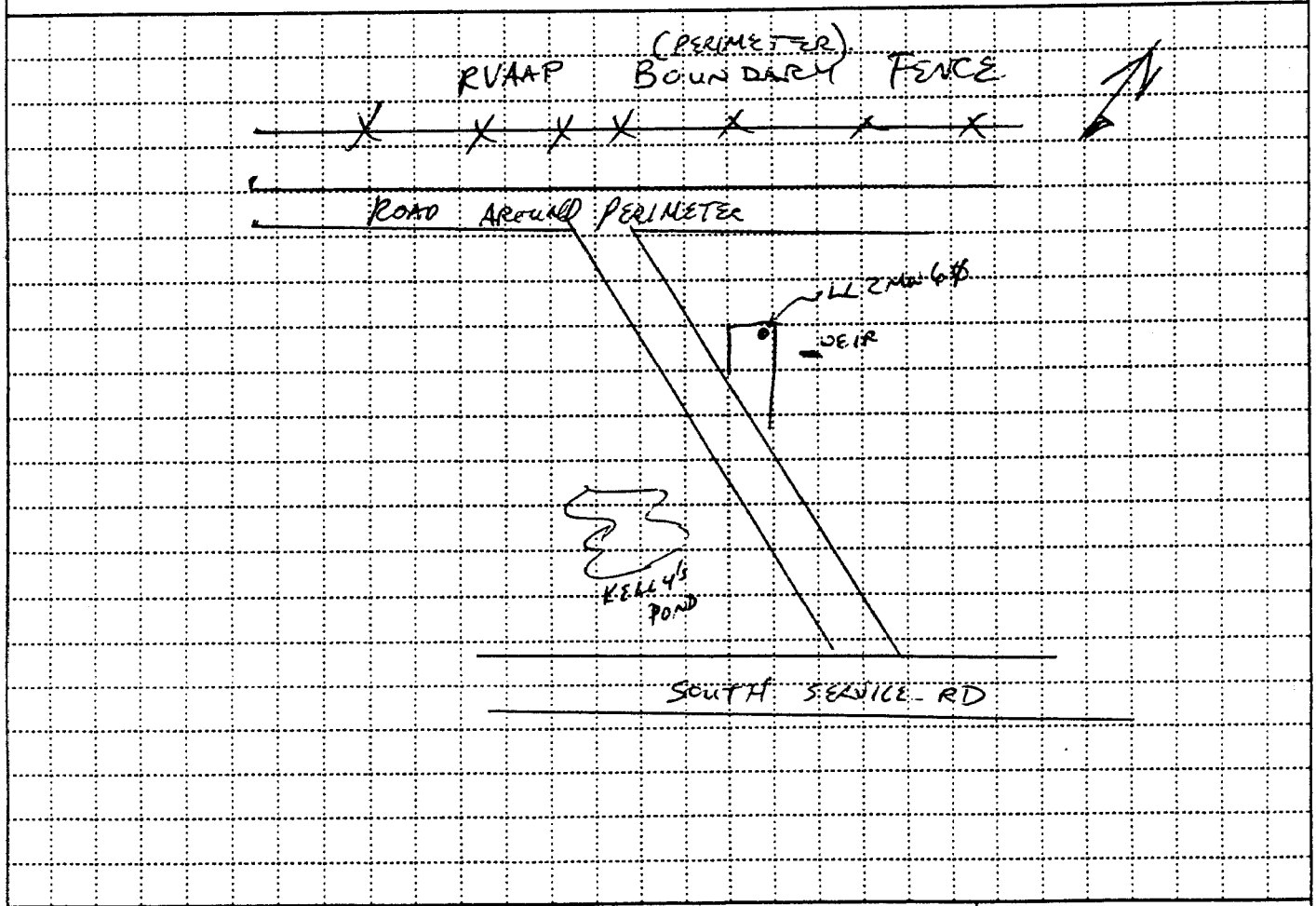
4. PROJECT: RVAAP	5. LOCATION: LL2 Area @ RVAAP, Ravenna, OH
6. NAME OF DRILLER: DAVE NEWMAN	7. MANUFACTURER'S DESIGNATION OF DRILL: MOBILE B-61 HDX
8. SIZE AND TYPE OF DRILLING AND SAMPLING EQUIPMENT: 4¼" (6 5/8 in HSA, 2" split Spoons, tri-cone roller bit (5⅞") Mobile B-61 HDX, air compressor, 2" skel split spoon, & safety driving hammer.	9. HOLE LOCATION: Beside of weir, along rd., S. of Kelly's Pond.
	10. SURFACE ELEVATION:
11. DATE STARTED: 11 AUG. 96	12. DATE COMPLETED: 12 AUG. 96
13. OVERBURDEN THICKNESS: 7.9 FT BGS	14. DEPTH GROUNDWATER ENCOUNTERED: 13.2 FT BGS
15. DEPTH DRILLED INTO ROCK: 11.3 FT BGS	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 1 HR. 15 MIN @ 7.5 FT BGS.
17. TOTAL DEPTH OF HOLE: 19.2 FT BGS	18. OTHER WATER LEVEL MEASUREMENTS (SPECIFY):

19. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	20. TOTAL NUMBER OF CORE BOXES
NA	NA	NA	NA

21. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	22. TOTAL CORE RECOVERY %
NA	NA	NA	NA	NA	NA	NA

23. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	24. SIGNATURE OF INSPECTOR
MW. INSTALLED	NA	INSTALLED	NA	Matthew B. Vest.

LOCATION SKETCH/COMMENTS — SCALE: NOT TO SCALE



PROJECT	HOLE NO.
RVAAP	LL2mw68

ENG FORM 5056-R, AUG 94 (Proponent: CECW-EG)

HTRW DRILLING LOG

HOLE NUMBER: LL2mw6Ø
SHEET: 2 of 3

PROJECT: RVAAP
INSPECTOR: Matthew B. Vest

ELEV.	DEPTH	DESCRIPTION OF MATERIALS	FIELD SCREENING RESULTS	GEOTECH TESTING / BLOW COUNTS	ANALYTICAL SAMPLE NO.	REMARKS
		TOPSOIL W/ Roots. Ø.4	Ø.4 ppm	4 12 12 16	NA	REC 1.4 out of 2.Ø Breathing Zone (BZ) @ Ø.4 ppm Borehole @ Ø.Ø ppm Using MiniRae & Dräger LEL. MIX 251 Serial # Ø12Ø6Ø83-16Ø. (MiniRae 7# ØPØ167) to monitor. 2.Ø
	2.Ø	ML SILT w/ sand, low plasticity, medium density, sl. damp, 10YR 5/3 brown mottled w/ lt/w gray & 5YR 4/6 yellowish red, w/ occasional sand grains up to Ø.1 in. dia. & chert frags, conquidally fractured, up to Ø.3 in., roots common & wood fragments occur occasionally probable loss of Ø.6 ft.	Ø.Ø ppm	9 1Ø 12 15	NA	REC 1.4 out of 2Ø BZ Ø.Ø ppm Borehole Ø.Ø ppm. 4.Ø
	4.Ø	Probable loss of Ø.6 ft.				
		ML CLAYEY SILT, low plasticity, loose, sl. damp, 10YR 4/1 dark gray mottled w/ 5YR 3/3 dark reddish brown, w/ occasional frags of f-m grained sandstone.	Ø.Ø ppm	5 8 1Ø 11	NA	REC 1.3 out of 2.ØØ BZ ØØØppm Borehole Ø.Ø ppm 6.Ø
	6.Ø	Probable loss of Ø.7ft				
		6.5 ML SILT w/ SAND, low plas, med. density, damp, 7.5YR 4/6 strong brown w/ black flakes of organic matter. 7.8 SM SILTY SAND, low plasticity, med. density, moist, 2.5Y 5/3 lt. olive brown. 7.7 weathered f-m grained SANDSTONE FRAGMENTS 7.9	Ø.Ø ppm	3 9 2Ø 5Ø/5	NA	REC 1.9 out of 2.Ø ft. 1.9 BZ Ø.Ø ppm Borehole ppm Ø.Ø
	8.Ø	7.9FT BGS TOP OF COMPETENT ROCK.	NA	NA	NA	BZ Ø.Ø ppm Borehole Ø.Ø ppm AUGERED WITHOUT SAMPLING SPOONS TO 10.ØFTBGS IN ORDER TO HOOK UP AIR ROTARY SYSTEM DIVERTER. TOP OF ROCK @ 7.9FT BGS (COMPETENT)
	1Ø.Ø					1Ø.Ø

PROJECT: RVAAP
HOLE NO: LL2 mw 6Ø

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HTRW DRILLING LOG

HOLE NUMBER: LL2mw60

PROJECT: RVAAP | INSPECTOR: Matthew S. West | SHEET: 3 of 3

ELEV. (A)	DEPTH (B)	DESCRIPTION OF MATERIALS (C)	FIELD SCREENING RESULTS (D)	GROUNDWATER ENCOUNTERED (E)	ANALYTICAL SAMPLE NO. (F)	REMARKS (G)
	10.0	fine to med grained SANDSTONE, 10 4R 4/6 brownish yellow, sl. damp	0.0 ppm	NA	NA	B2 0.0 ppm USING AIR ROTARY, DRILLING W/ TRI-CONE ROLLER BIT.
	13.2					13.2
		fine to med gr. SANDSTONE, 10YR 6/6 brownish yellow, wet	0.0 ppm	NA	NA	B3 0.0 ppm Hit first water @ 13.2 ft BGS.
	19.2					19.2
		STOP AIR ROTARY @ 19.2 FT BGS.				STOP DRILLING @ 19.2 FT BGS.

PROJECT: RVAAP | HOLE NO.: LL2mw60

94

MONITORING WELL

PROJECT NAME: RVAAP DELIVERY ORDER NO: 0022

WELL NUMBER: LL2mw 60	BEGIN: 11/AUG/96	END:
COORDINATES: N: E:	REFERENCE POINT: MSL	ELEVATION: