APPENDIX A

BORING LOGS AND WELL CONSTRUCTION LOGS

BORING LOGS

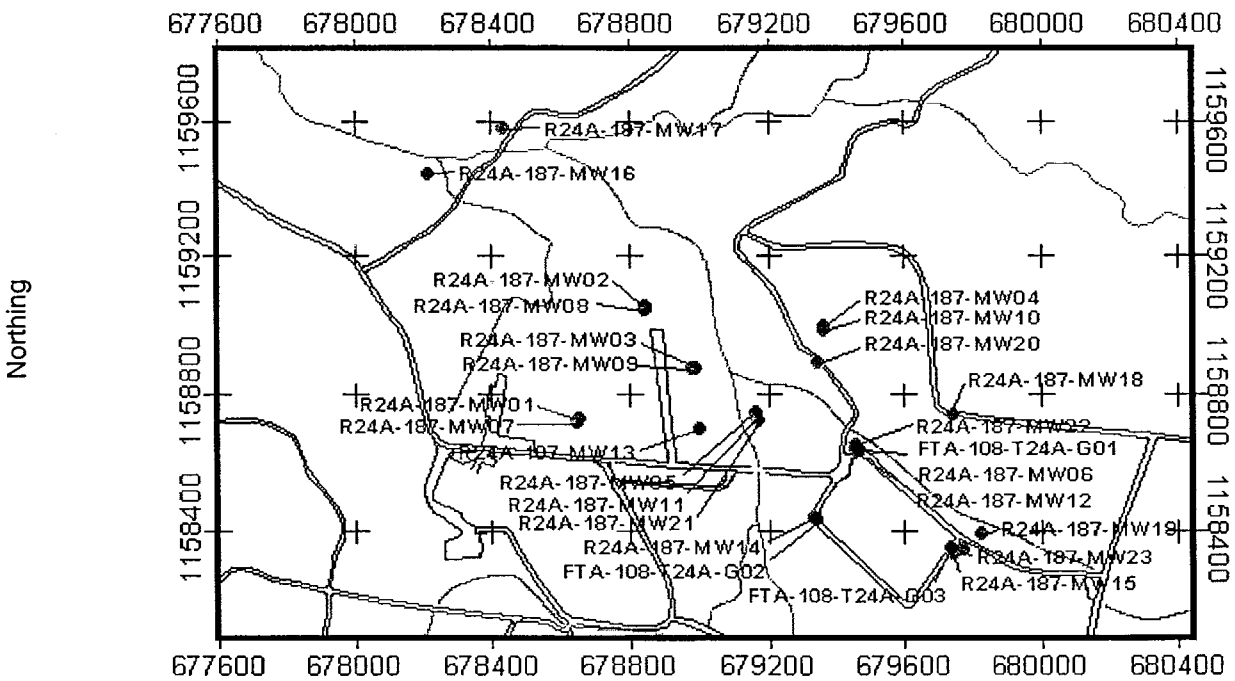
HTRW DRILLING LOG

	District: **Mobile USACE**	HOLE NUMBER R24A-187-MW01
1. Company name: **IT Corporation**	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 6 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel, Steven Gautney	6. Mfr. designation of drill: Thunder Probe, 75 CME
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 2'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 999.72 10. Date started: 10/04/00 — 11. Date completed: 10/19/00
12. Overburden thickness (feet bgs): >45	15. Depth groundwater encountered (feet bgs): 25
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 17.7 after 24 hours
14. Total depth of hole (feet bgs): 45	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	X	X	CWM Breakdown Products	Nitroaromatics	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		Leslie O'Hare/Dennis Mayton		

LOCATION SKETCH/COMMENTS:



Project: Fort McClellan	bgs= below ground surface CD= Corrected Depth HP= Hydraulic Pressure	NA =Not applicable psi= pounds per square inch WP= Water Pressure	Hole no.: R24A-187-MW01

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW01

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 2 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Dry, light brown to yellowish orange SILT, trace quartz, quartz-rich subrounded gravel, trace subrounded fine Sand, trace roots.	ml		Organic Vapor = 0.0ppm		JG0001		Rec 1.0'/1.0' (0-1' bgs)
	1	ml: Dry, yellowish orange SILT, little subrounded fine Sand, little quartz rich subangular fine Gravel.	ml		Organic Vapor = 0.0ppm				Rec 3.0'/3.0' (1-4' bgs)
	2								
	3								
	4	cl: Moist, yellowish orange stiff CLAY, some subrounded fine Sand, little quartz rich subangular Gravel.	cl		Organic Vapor = 0.0ppm				Rec 4.0'/4.0' (4-8' bgs)
995	5								
	6								
	7						JG0002		
	8	NA: No sample collected for lithologic description.	NA		Organic Vapor = 0.0ppm				Direct push refusal at 8', begin HSA
	9								
990	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW01

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 3 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		cl: Yellowish orange stiff CLAY, little Silt, little subangular quartz-rich coarse to fine Gravel.	cl		Organic Vapor = 0.0ppm			3 11 32 21	Rec 1.7'/2.0" (10-12' bgs)
	11	sh: Yellowish orange to light gray highly weathered SHALE, some coarse quartz Sand, little fine to coarse quartz-rich subrounded to subangular Gravel.	sh						
		NA: No recovery.	NA						
	12	NA: No sample collected for lithologic description.							
	13								
			NA						
	14								
985									
	15	ml: Yellowish orange to light gray moist SILT, some Sand, orange oxidation stains.			Organic Vapor = 0.0ppm			1 8 17 28	Rec 1.8'/2.0' (15-17' bgs)
	16		ml						
		NA: No recovery.	NA						
	17	NA: No sample collected for lithologic description.							
	18								
			NA						
	19								
980									
	20	ml: Tan to light gray to black moist SILT, some			Organic			24 33	Rec 1.5'/1.8' (20-21.8' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW01

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 4 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21	Clay, some Sand.	ml		Vapor = 0.0ppm			43 50/0.3'	
		NA: No recovery.	NA						
	22	NA: No sample collected for lithologic description.							
	23		NA						
	24								
975	25	NA: No recovery.						31 17 19 22	Rec 0.0'/2.0' (25-27' bgs) No recovery, split spoon taken again between 27 and 29' bgs) Groundwater encountered at 25' bgs
	26		NA						
	27	ml: Light gray to yellowish orange SILT, some Clay, little fine Sand.			Organic Vapor = 0.0ppm			5 15 24 20	Rec 2.0'/2.0' (27-29' bgs)
	28		ml						
	29	cl-ml: Wet, yellowish orange SILT and CLAY, little Sand.							
970	30								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW01

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 5 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31								
	32								
	33								
	34								
965	35								
	36								
	37		cl-ml						
	38								
	39								
960	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW01

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 6 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41								41
	42		cl-ml						42
	43								43
	44								44
955	45								Bottom of borehole at 45' bg

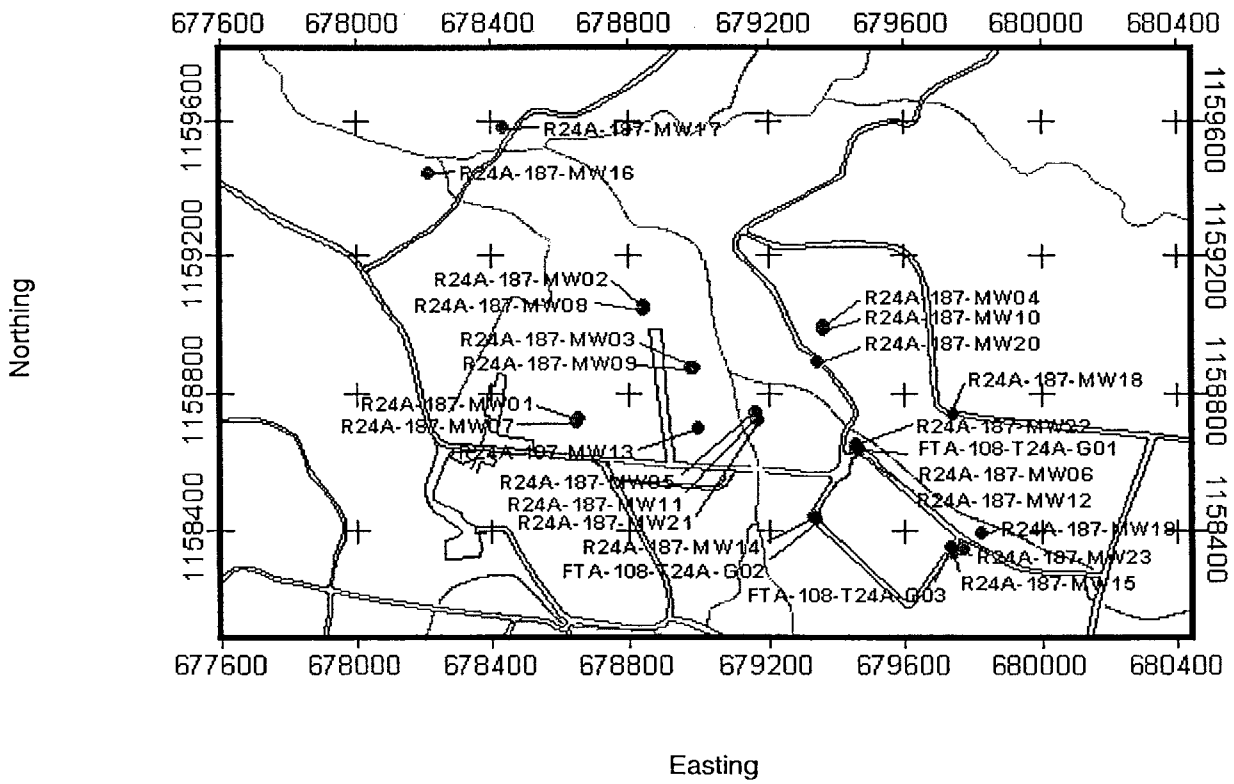
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** R24A-187-MW02
1. Company name: **IT Corporation**	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 6 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel, Red McNeil	6. Mfr. designation of drill: Thunder Probe, Schramm T450W
7. Sizes and types of drilling and sampling equipment: Direct Push, Air Rotary Casing Hammer DP - 2"x24" Acetate-Lined Sampler AR - 7 7/8" Hammer Bit	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 973.36 10. Date started: 10/04/00 — 11. Date completed: 11/02/00
12. Overburden thickness (feet bgs): >45	15. Depth groundwater encountered (feet bgs): 35
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 24 after 45 mins
14. Total depth of hole (feet bgs): 45	17. Other water level measurements (specify): 15.2 after 24 hours

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	X	X	CWM Breakdown Products	Nitroaromatics	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		James Bond/Dennis Mayton		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW02

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 2 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Dry, yellowish orange SILT, little quartz rich subangular coarse Gravel, trace roots, trace Clay.	ml		Organic Vapor = 0.0ppm		JG0003		Rec 3.0'/4.0' (0-4' bgs)
	4	ml: Dry, yellowish orange SILT, some quartz rich subrounded coarse Gravel, some subrounded medium Sand, trace Clay.	ml		Organic Vapor = 0.0ppm		JG0004		Rec 2.0'/2.0' (4-6' bgs)
970	6	qrtzt-sh: QUARTZITE and CLAY (shale?), quartzite is fine angular gravel, reddish brown and grayish brown; clay (shale?) is reddish brown, dry.	qrtzt-sh						Direct push refusal at 6', begin air rotary Descriptions are from air rotary cutting returns
965	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW02

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 3 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	11		qrtzt-sh						
	12								
960	13								
	14								
	15								
	16								
	17								
	18	sh: Dry, reddish brown, SHALE.	sh						
955	19	qrtzt-sh: Interbedded fine angular reddish brown and grayish brown QUARTZITE gravel and reddish brown CLAY (shale?).							Formation drills like quartzite that is interbedded with shale
	20								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW02

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 4 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21								
	22								
	23								
950									
	24								
	25		qrtzt-sh						
	26								
	27								
	28								
945									
	29								
	30								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW02

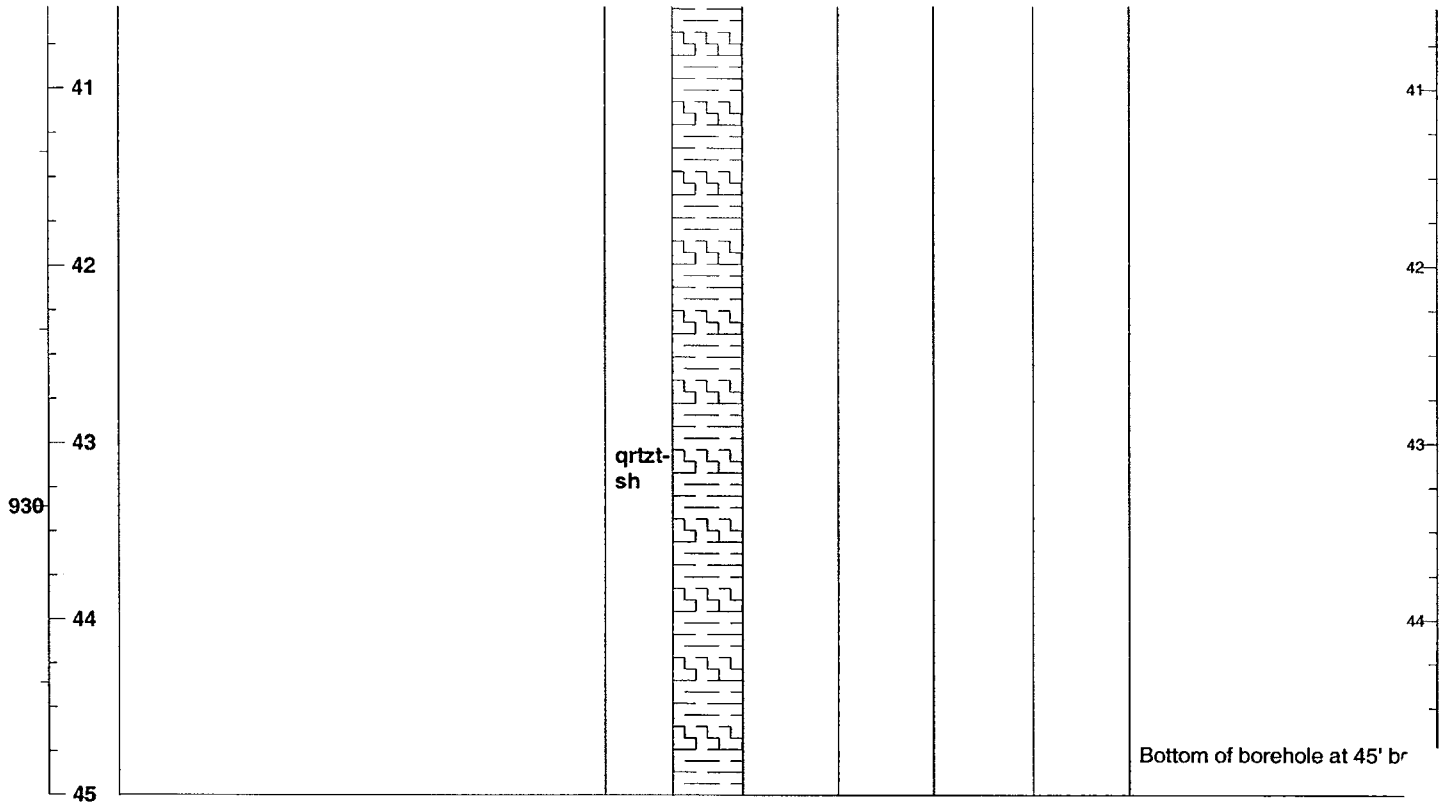
Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 5 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31								
	32								
	33								
940									
	34								
	35								Groundwater encountered at 35' bgs
	36		qrtzt-sh						
	37								
	38								
935									
	39								
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW02

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 6 of 6 sheets



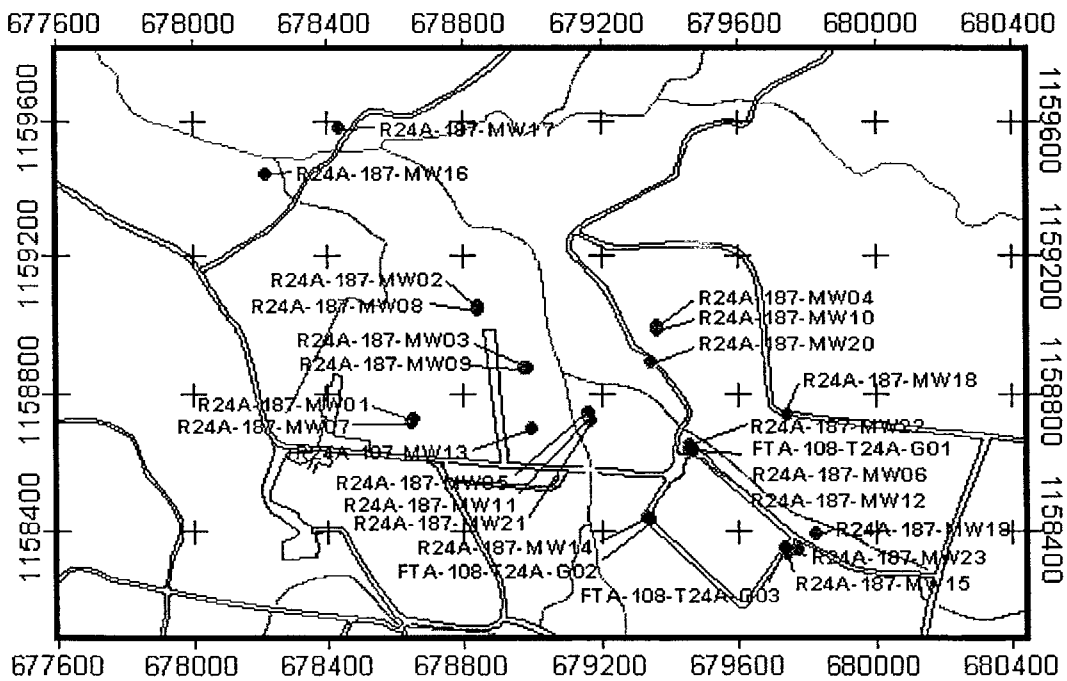
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** R24A-187-MW03
1. Company name: **IT Corporation**	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 6 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel, Steven Gautney	6. Mfr. designation of drill: Thunder Probe, 75 CME
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 24"x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 978.02 10. Date started: 10/04/00 — 11. Date completed: 10/23/00
12. Overburden thickness (feet bgs): >44	15. Depth groundwater encountered (feet bgs): 32
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 20.3 after 24 hours
14. Total depth of hole (feet bgs): 44	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	X	X	CWM Breakdown Products	Nitroaromatics	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		Dennis Mayton/Leslie O'Hare		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW03

Project: Fort McClellan | Geologist: Dennis Mayton/Leslie O'Hare | Sheet 2 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Dry, yellowish orange to light brown SILT, some quartz-rich subangular Gravel, trace roots.	ml		Organic Vapor = 0.0ppm		JG0005		Rec 1.0'/1.0' (0-1' bgs)
	1	ml: Dry, yellowish orange to light brown SILT, little subrounded quartz-rich fine Gravel, trace subrounded fine Sand.	ml		Organic Vapor = 0.0ppm				Rec 1.5'/3.0' (1-4' bgs)
	2								
975	3								
	4	ml: Yellowish orange to light gray SILT, some Clay, trace quartz Gravel, trace subrounded fine Sand.	ml		Organic Vapor = 0.0ppm		JG0006	7 7 4 6	DP - Rec 1.0'/1.0' (4-5' bgs). HSA - Rec 1.0'/2.0' (4-6' bg
	5	ml: Yellowish orange to light gray SILT, some fine to medium Sand, little Gravel (fine weathered black shale fragments and fine to coarse quartz-rich subangular sandstone.)	ml						
	6	NA: No sample collected for lithlogic description.	NA						
	7								
970	8	ml: Yellowish orange to light gray SILT, some fine Sand, Orange oxidation stains.	ml		Organic Vapor = 0.0ppm			49 12 16 13	Rec 1.7'/2.0' (8-10' bgs)
	9								
	10	NA: No recovery.	NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW03

Project: Fort McClellan | Geologist: Dennis Mayton/Leslie O'Hare | Sheet 3 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		NA: No sample collected for lithologic description.							
	11								
	12		NA						
965	13								
	14	ml: Light gray to greenish gray moist SILT, little Clay.	ml		Organic Vapor = 0.0ppm			20 40 27 14	Rec 1.0'/2.0' (14-16' bgs)
		gp: Light gray to tan subangular coarse quartz-rich Gravel, some medium to coarse Sand.	gp						
	15	ml: Greenish gray to yellowish orange moist SILT, some fine Sand, little Clay.	ml						
		NA: No recovery.	NA						
	16	NA: No sample collected for lithologic description.							
	17								
			NA						
960	18								
	19	ml: Light gray to greenish gray moist SILT, some fine Sand, orange oxidation stains.			Organic Vapor = 0.0ppm			7 12 12 11	Rec 2.0'/2.0' (19-21' bgs)
	20		ml						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW03

Project: Fort McClellan | Geologist: Dennis Mayton/Leslie O'Hare | Sheet 4 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21	NA: No sample collected for lithologic description.							
	22		NA						
955	23								
	24	ml: Greenish gray moist SILT, little very fine quartz Sand, trace Clay, orange oxidation stains, white veins.			Organic Vapor = 0.0ppm			16 35 51 50/0.3'	Rec 1.8/1.8' (24-25.8' bgs)
	25		ml						
	26	NA: No sample collected for lithologic description.							
	27		NA						
950	28								
	29	ml: Greenish gray moist SILT, some fine Sand, orange oxidation stains.						19 30 50/0.4'	Rec 1.4'/1.4' (29-30.4' bgs)
	30		ml						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW03

Project: Fort McClellan | Geologist: Dennis Mayton/Leslie O'Hare | Sheet 5 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31	NA: No sample collected for lithologic description.							
	32		NA						Groundwater encountered at 32' bgs
945	33								
	34	ml: Yellowish orange SILT, little fine Sand.			Organic Vapor = 0.0ppm				Description from HSA drill cuttings
	35								
	36								
	37								
940	38								
	39		ml						
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW03

Project: Fort McClellan | Geologist: Dennis Mayton/Leslie O'Hare | Sheet 6 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41								41
	42		ml						42
935	43								43
	44								Bottom of borehole at 44' bgs 44

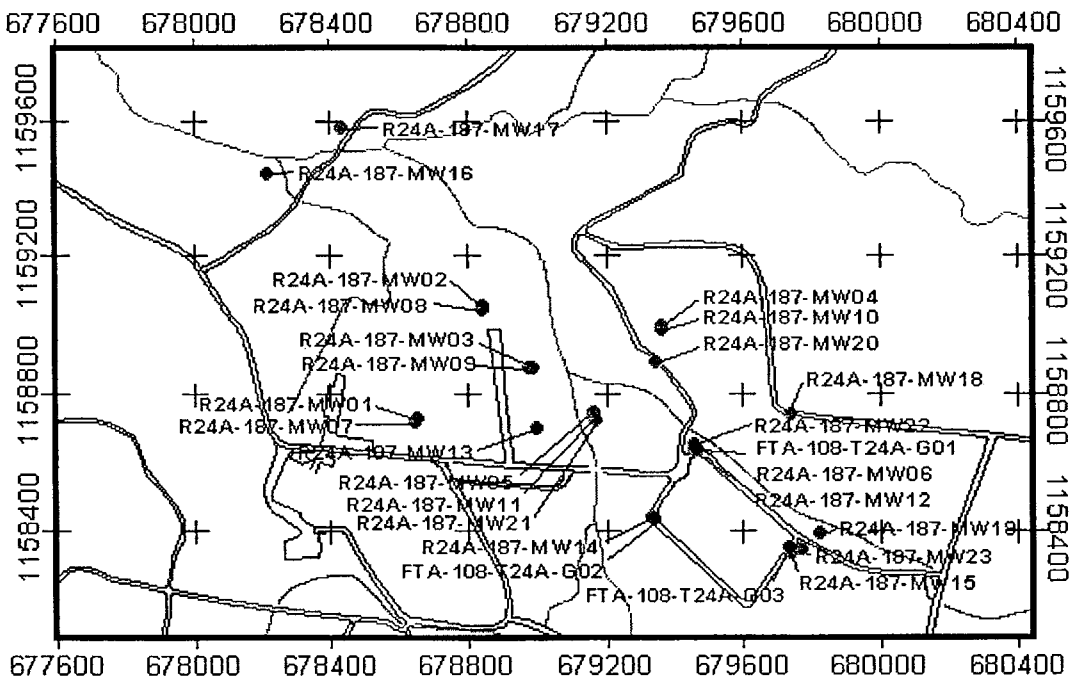
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** R24A-187-MW04
1. Company name: **IT Corporation**	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 8 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel, Ken Gobell	6. Mfr. designation of drill: Thunder Probe, CME-750
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 24"x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 24"x2" Steel Split Spoons	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 1012.29 10. Date started: 10/04/00 — 11. Date completed: 10/18/00
12. Overburden thickness (feet bgs): >62	15. Depth groundwater encountered (feet bgs): NA
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 24.1 on 10/02/00
14. Total depth of hole (feet bgs): 62	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	X	X	CWM Breakdown Products	Nitroaromatics	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist: Dennis Mayton		
		X				

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW04

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 2 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Dry yellowish orange to light brown SILT, some quartz-rich subangular Gravel, little roots.	ml		Organic Vapor = 0.0ppm		JG0007 JG0008 JG0009		Rec 4.0'/4.0' (0-4' bgs)
	1	ml: Dry yellowish orange SILT, some quartz-rich subangular fine Gravel.			Organic Vapor = 0.0ppm				
1010	2		ml						
	3						JG0010		
	4	NA: No sample collected for lithologic description.							Direct push refusal at 4'
	5								
	6		NA						
	7								
1005	8	sh: Dry yellowish orange to light tan SHALE, weathered.	sh		Organic Vapor = 0.0ppm			50/0.3'	Rec 0.3'/0.3' (8-8.3' bgs)
		NA: No sample collected for lithologic description.							
	9		NA						
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW04

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 3 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	11								
	12								
1000									
	13								
	14								
	15								
	16		NA						
	17								
995									
	18								
	19								
	20								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW04

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 4 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21								
990	22		NA						
	23								
	24	sh: Lightly moist dark gray SHALE.	sh		Organic Vapor = 0.0ppm			50/0.3'	Rec 0.2'/0.3' (24-24.3' bgs)
		NA: No sample collected for lithologic description.							
	25								
	26								
985	27		NA						
	28								
	29								
	30								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW04

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 5 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31								
	32								
980	33								
	34								
	35		NA						
	36								
	37								
975	38								
	39	sh: Dry yellowish orange to tan SHALE, weathered.	sh		Organic Vapor = 0.0ppm			50/0.2'	Rec 0.2'/0.2' (39-39.2' bgs)
		NA: No sample collected for lithologic description.							
	40		NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW04

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 6 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41								
	42								
970									
	43								
	44		NA						
	45								
	46								
	47								
965									
	48								
	49	sh: Moist dark gray SHALE.	sh		Organic Vapor = 0.0ppm			50/0.2'	Rec 0.2'/0.2' (49-49.2' bgs)
		sh: Dark gray SHALE.							Description from HSA drill cuttings
	50								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW04

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 7 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51								
	52								
960	53								
	54								
	55								
	56		sh						
	57								
955	58								
	59								
	60								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW04

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 8 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								61
			sh						Bottom of borehole at 62' bgs
	62								62

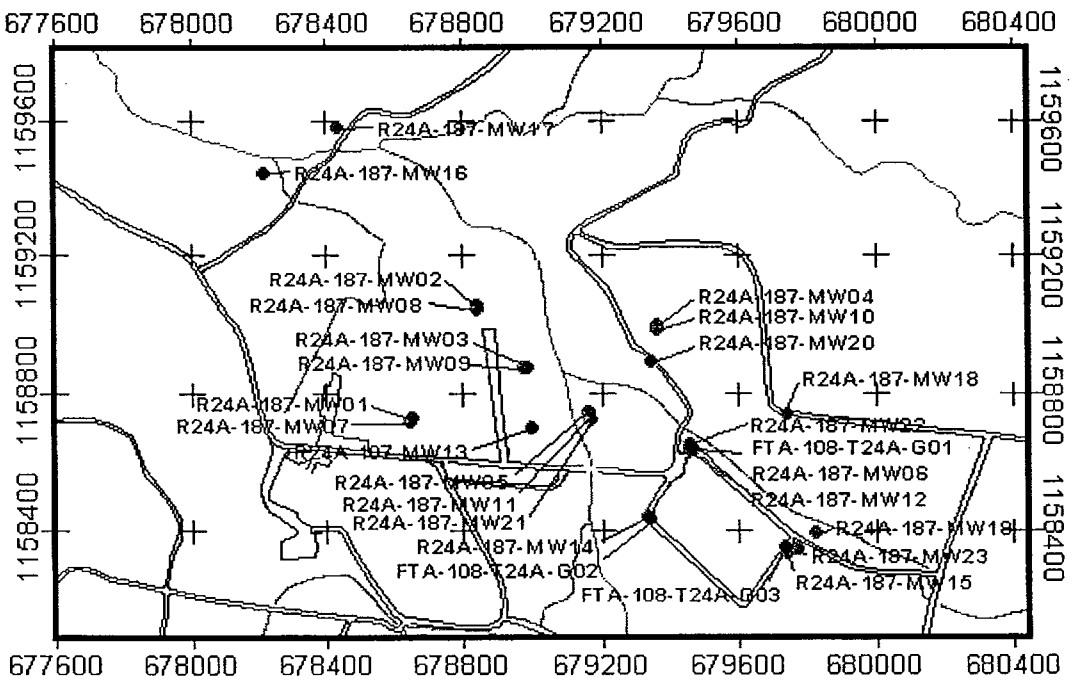
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** R24A-187-MW05
1. Company name: **IT Corporation**	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 6 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel, Ken Gobell	6. Mfr. designation of drill: Thunder Probe, CME-750
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 2'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 981.75 10. Date started: 10/05/00 — 11. Date completed: 10/27/00
12. Overburden thickness (feet bgs): >46	15. Depth groundwater encountered (feet bgs): ~38
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 15.3 on 10/30/00
14. Total depth of hole (feet bgs): 46	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA					
20. Samples for chemical analysis:	**VOC**	**Metals**	**Other (specify)**	**Other (specify)**	**Other (specify)**	**21. Total core recovery:**
	X	X				NA
22. Disposition of hole:	**Backfilled**	**Monitoring well**	**Other (specify)**	Geologist:		
		X		Leslie O'Hare/Dennis Mayton		

LOCATION SKETCH/COMMENTS:



Project: Fort McClellan

bgs= below ground surface
CD= Corrected Depth
HP= Hydraulic Pressure
NA =Not applicable
psi= pounds per square inch
WP= Water Pressure

Hole no.: R24A-187-MW05

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW05

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 2 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Brown SILT, little Sand, some coarse to fine quartz-rich Gravel, trace roots.	ml		Organic Vapor = 0.0ppm		JG0011		Rec 1.0'/1.0' (0-1' bgs)
	1	ml: Brown SILT, little Sand, little quartz-rich coarse angular gravel.							Rec 1.7'/2.0' (1-3' bgs)
980	2		ml		Organic Vapor = 0.0ppm		JG0012		
	3	NA: No sample collected for litholoigc description.							Direct push refusal at 3' bgs
	4	sh: Dry olive gray to yellowish orange SHALE.	sh		Organic Vapor = 0.0ppm			18 50/0.3'	Rec 0.8'/0.8' (4-4.8' bgs)
	5	NA: No sample collected for litholoigc description.	NA						
975	6								
	7								
	8								
	9	sh: Dry dark gray SHALE.	sh		Organic Vapor = 0.0ppm			31 50/0.4'	Rec 0.9'/0.9' (9-9.9' bgs)
	10	NA: No sample collected for litholoigc							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW05

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 3 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		description.							
	11		NA						
970	12								
	13								
	14	sh: Lightly moist dark gray SHALE.	sh		Organic Vapor = 0.0ppm			50/0.4'	Rec 0.4'/0.4' (14-14.4' bgs)
		NA: No sample collected for litholoigc description.							
	15								
	16								
965	17		NA						
	18								
	19	sh: Dry dark gray SHALE.	sh		Organic Vapor = 0.0ppm			27 50/0.5'	Rec 1.0'/1.0' (19-20' bgs)
	20	NA: No sample collected for litholoigc							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW05

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 4 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		description.							
	21								21
960	22								22
	23								23
	24								24
	25		NA						25
	26								26
955	27								27
	28								28
	29								29
	30								30

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW05

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 5 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31								
950	32								
	33								
	34								
	35		NA						
	36								
945	37								
	38								
	39	sh: Moist cuttings, dark gray SHALE.	sh					50/0.5'	Rec 0.5'/0.5' (39-39.5' bgs)
	40	NA: No sample collected for litholoigc description.	NA		Organic Vapor = 0.0ppm				

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW05

Project: Fort McClellan | Geologist: Leslie O'Hare/Dennis Mayton | Sheet 6 of 6 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
940	41								
	42		NA						
	43								
	44	sh: Moist dark gray SHALE.	sh		Organic Vapor = 0.0ppm			50/0.04'	Rec 0.04'/0.04' (44-44.04' bgs)
		sh: Moist dark gray SHALE.							Description from HSA drill cuttings
	45		sh						
									Bottom of borehole at 46' bgs
	46								

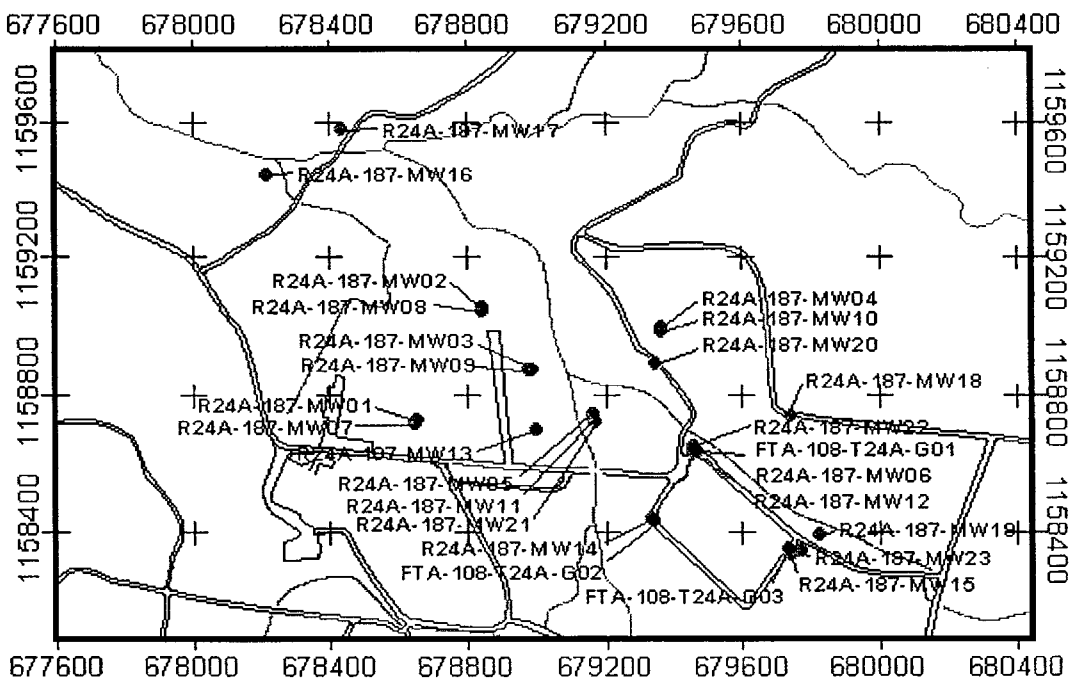
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** R24A-187-MW06
1. Company name: **IT Corporation**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 7 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Ken Gobell	6. Mfr. designation of drill: CME-750
7. Sizes and types of drilling and sampling equipment: Hollow Stem Auger HSA - 5'x4.25" ID Augers, 24"x2" Steel Split Spoons	8. Hole location: Training Area T-24A, Parcel 187
	9. Surface elevation (feet above mean sea level): 1005.77
	10. Date started: 10/19/00 — 11. Date completed: 10/20/00
12. Overburden thickness (feet bgs): >59	15. Depth groundwater encountered (feet bgs): Not encountered
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 24.1
14. Total depth of hole (feet bgs): 59	17. Other water level measurements (specify): 11.7 on 10/23/01

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA					
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)	Geologist:		
		X		Dennis Mayton		

LOCATION SKETCH/COMMENTS:



Project: Fort McClellan

bgs= below ground surface
CD= Corrected Depth
HP= Hydraulic Pressure
NA =Not applicable
psi= pounds per square inch
WP= Water Pressure

Hole no.: R24A-187-MW06

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW06

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 2 of 7 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
1005	0	NA: No sample collected for lithologic description.							
	1								
	2		NA						
	3								
	4	sh: Dry yellowish orange to tan SHALE, weathered.	sh					50/0.5'	Rec 0.2'/0.5' (4-4.5' bgs)
			NA		Organic Vapor = 0.0ppm				
		NA: No recovery.							
	5	NA: No sample collected for lithologic description.							
1000	6								
	7								
			NA						
	8								
	9								
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW06

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 3 of 7 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		sh: Dry medium gray SHALE.	sh		Organic Vapor = 0.0ppm			50/0.5'	Rec 0.3'/0.5' (10-10.5' bgs)
		NA: No recovery.	NA						
995	11	NA: No sample collected for lithologic description.							
	12								
	13								
	14								
	15		NA						
990	16								
	17								
	18								
	19								
	20								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW06

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 4 of 7 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
985	21								
	22								
	23								
	24								
	25		NA						
980	26								
	27								
	28								
	29								
	30	sh: Dry dark gray SHALE.	sh		Organic Vapor			50/0.1'	Rec 0.1'/0.1' (30-30-1' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW06

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 5 of 7 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		NA: No sample collected for lithologic description.			= 0.0ppm				
975	31								31
	32								32
	33								33
	34								34
	35		NA						35
970	36								36
	37								37
	38								38
	39								39
	40								40

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW06

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 6 of 7 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
965	41								
	42								
	43								
	44								
	45		NA						
960	46								
	47								
	48								
	49								
	50	sh: Dry dark gray SHALE.	sh		Organic Vapor = 0.0ppm			50/0.3'	Rec 0.1'/0.3' (50-50.3' bgs)
		NA: No recovery.	NA						Description from HSA drill cuttings

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW06

Project: Fort McClellan | Geologist: Dennis Mayton | Sheet 7 of 7 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
955	51	NA: No sample collected for lithologic description.	NA						
	52	sh: Dark gray SHALE.			Organic Vapor = 0.0ppm				
	53								
	54								
	55		sh						
950	56								
	57								
	58								
	59								Bottom of borehole at 59' bgs

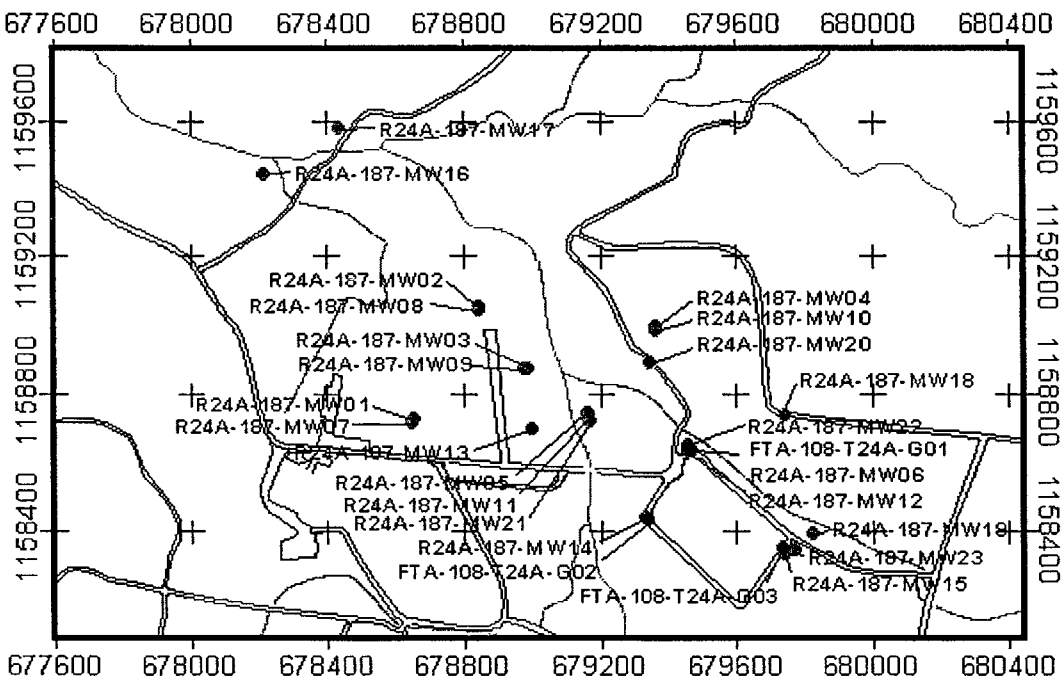
HTRW DRILLING LOG

	District: **Mobile USACE**	HOLE NUMBER R24A-187-MW07
1. Company name: **IT Corporation**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 10 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Schramm T450W, CME 750
7. Sizes and types of drilling and sampling equipment: Air Percussion and Air Rotary, PQ Rock Coring AR - 12.25" Rotary Bit and 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 1000.82 10. Date started: 11/01/00 — 11. Date completed: 11/29/00
12. Overburden thickness (feet bgs): 50	15. Depth groundwater encountered (feet bgs): NA
13. Depth drilled into rock (feet bgs): 40	16. Depth to water and elapsed time after drilling completed (feet bgs): 20.5 on 12/06/00
14. Total depth of hole (feet bgs): 90	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 4		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						31.3
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		J. Bond/D. Allan		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 2 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
1000	0	ml: Dry, light brown to yellowish orange SILT, trace quartz, quartz-rich subrounded gravel, trace subrounded fine Sand, trace roots.	ml						Lithologic description 0-45' bgs from R24A-187-MW01
	1	ml: Dry, yellowish orange SILT, little subrounded fine Sand, little quartz rich subangular fine Gravel.	ml						
	4	cl: Moist, yellowish orange stiff CLAY, some subrounded fine Sand, little quartz rich subangular Gravel.	cl						
995	8	NA: No sample collected for lithologic description.	NA						
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 3 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		cl: Yellowish orange stiff CLAY, little Silt, little subangular quartz-rich coarse to fine Gravel.	cl						
990	11	sh: Yellowish orange to light gray highly weathered SHALE, some coarse quartz Sand, little fine to coarse quartz-rich subrounded to subangular Gravel.	sh						
		NA: No recovery.	NA						
	12	NA: No sample collected for lithologic description.							
	13		NA						
	14								
	15	ml: Yellowish orange to light gray moist SILT, some Sand, orange oxidation stains.							
985	16		ml						
		NA: No recovery.	NA						
	17	NA: No sample collected for lithologic description.							
	18		NA						
	19								
	20	ml: Tan to light gray to black moist SILT, some							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 4 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21	Clay, some Sand.	ml						
		NA: No recovery.	NA						
	22	NA: No sample collected for lithologic description.							
	23		NA						
	24								
	25	NA: No recovery.							
975	26		NA						
	27	ml: Light gray to yellowish orange SILT, some Clay, little fine Sand.							
	28		ml						
	29	cl-ml: Wet, yellowish orange SILT and CLAY, little Sand.							
	30								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 5 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
970	31								
	32								
	33								
	34								
	35								
965	36								
	37		cl-ml						
	38								
	39								
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 6 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
960	41								
	42		cl-ml						
	43								
	44								
	45	NA: No sample collected for lithologic description.							
955	46								
	47		NA						
	48								
	49								
	50	sltst: SILTSTONE/MUDSTONE, moderately hard, moderately weathered (dark yellowish orange and light gray) no areas of swelling.	sltst			Box 1 of 4 (50 to 64'			Set 8" casing at 50' Run 1 (50-53' bgs) Ran 3.0' Rec 0.8' Loss 2.2' UL 2.2'

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 7 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
950	51	NA: No recovery.	NA			bgs)			Water used 200 gallons, rec 100%, light gray Time 2 mins RQD 0%
	52								
	53	sltst: SILTSTONE, moderately hard, slightly weathered, rounded grains, trace sand, iron staining, fracture faces with slickensides, parallel banding, grayish orange, no areas of swelling.	sltst						Run 2 (53-58' bgs) Ran 5.0' Rec 2.4' Loss 2.6' UL 2.6' Water used 200 gallons, rec 100%, light gray Time 3 mins RQD 0%
	54								
	55	sltst: MUDSTONE/SILTSTONE, slightly weathered, very soft, mottled, grayish orange and pale yellow.	sltst						
945	56	NA: No recovery.	NA						
	57								
	58	sltst: SILTSTONE, soft, slightly weathered, fracture zones at 58.5 to 58.7 ft (45 degree, fine to medium sized fragments in fracture), 59.8 to 60 ft (horizontal and 45 degree, fine to medium gravel sized fragments), 60.5 to 62.1 ft (vertical fracture), other closed fractures throughout, all with iron staining, horizontal banding pale greenish yellow and yellowish orange.	sltst						Run 3 (58-63' bgs) Ran 5.0' Rec 4.1' Loss 0.9' UL 0.9' Water used 200 gallons, rec 100%, grayish orange Time 13 mins RQD 28%
	59								
	60								
940									

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 8 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								61
	62	NA: No recovery.	NA						62
	63	sltst: SILTSTONE, slightly weathered, soft, lines of fracture throughout with iron staining along fractures, 64.7 to 65.3 ft bed of Mudstone, very soft, contains gravel sized fragments of Siltstone, pale greenish yellow and dark yellowish orange.							63 Run 4 (63-68' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used 200 gallons, rec 100%, grayish orange Time 11 mins RQD 56%
	64					Box 2 of 4 (64 to 74' bgs)			64
	65								65
935	66		sltst						66
	67								67
	68	sltst: SILTSTONE, slightly weathered, moderately hard, iron staining throughout along probable lines of fracture, pale greenish yellow and dark yellowish orange, small amount of Clay with Gravel fragments.							68 Run 5 (68-73' bgs) Ran 5.0' Rec 4.0' Loss 1.0' UL 1.0' Water used 200 gallons, rec 100%, grayish orange Time 23 mins RQD 60%
	69								69
	70		sltst						
930	71								71

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 9 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	72	NA: No recovery.	NA						
	73	sltst: SILTSTONE, slightly weathered, moderately hard, fractured throughout, iron staining, pale greenish yellow and dark yellowish orange.							Run 6 (73-78' bgs) Ran 5.0' Rec 3.0' Loss 2.0' UL 2.0' Water used 200 gallons, rec 100%, yellowish orange Time 60 mins RQD 0%
	74		sltst			Box 3 of 4 (74 to 85' bgs)			
	75								
925	76	mdst: Mudstone, moderately weathered, hard, fractured throughout, pale greenish yellow and dark yellowish orange.	mdst						
		NA: No recovery.							
	77		NA						
	78	sltst: SILTSTONE, slightly weathered in fracture zones, some iron staining, moderately hard to soft, pale greenish yellow, fractures at 80 ft (approximately 45 degees) 80.3 ft, (approximately 45 degees), 81.2 to 81.5 ft (horizontal and 60 degrees).							Run 7 (78-85' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used 200 gallons, rec 100%, yellowish orange Time 20 mins RQD 70%
	79								
	80		sltst						
920	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW07

Project: Fort McClellan | Geologist: J. Bond/D. Allan | Sheet 10 of 10 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	82								
	83	sltst: SILTSTONE, slightly weathered, soft, 83 to 83.6 ft zone containing quartz gravel, fracture zones at 83 to 83.4 ft (approximately 45 degrees contains gravel sized fragments), 83.9 (horizontal), 84.6 (approximately 30 degrees), 85.4 to 85.5 (approximately 45 degrees), contains gravel sized fragments), 86.8 to 87.3 (approximately 45 degrees, contains Clay in fracture), pale greenish yellow grading to grayish orange pink.	sltst			Box 4 of 4 (85 to 90' bgs)			Run 8 (83-88' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used 200 gallons, rec 100%, grayish orange Time 10 mins RQD 42%
	84								
	85								
915	86								
	87								
	88	sltst: SILTSTONE, slightly weathered, moderately hard to soft, fracture at 89 ft, has slickenside on fracture face, more Clay rich between 88 ft and 89 ft, pale yellowish brown.	sltst						Run 9 (88-90' bgs) Ran 2.0' Rec 2.0' Loss 0.0' UL 0.0' Water used 200 gallons, rec 100%, grayish orange Time 7 mins RQD 60%
	89								
	90								Bottom of borehole at 90' bgs

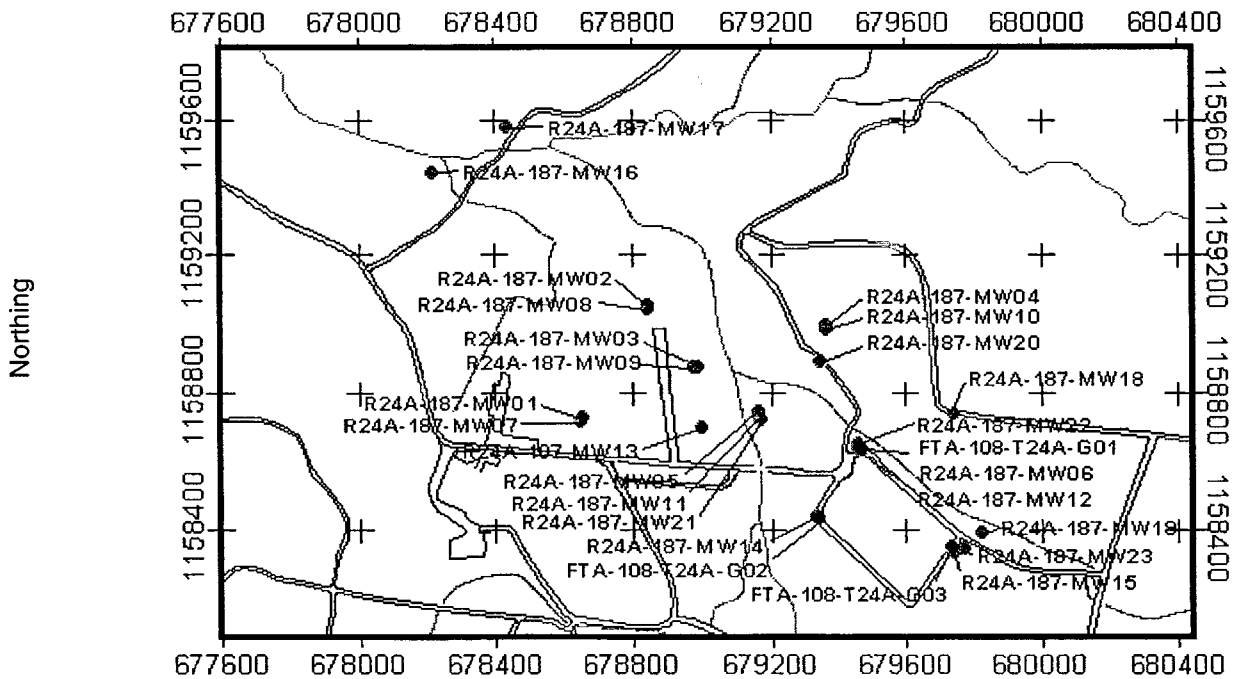
HTRW DRILLING LOG

	District: **Mobile USACE**	HOLE NUMBER R24A-187-MW08
1. Company name: **IT Corporation**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 9 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Schramm T450W, CME-750
7. Sizes and types of drilling and sampling equipment: Air Percussion and Air Rotary, PQ Rock Coring AR - 12 1/4" Rotary Bit and 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 973.74 10. Date started: 11/06/00 — 11. Date completed: 11/21/00
12. Overburden thickness (feet bgs): 6	15. Depth groundwater encountered (feet bgs): NA
13. Depth drilled into rock (feet bgs): 69.2	16. Depth to water and elapsed time after drilling completed (feet bgs): 12.65 on 11/22/00
14. Total depth of hole (feet bgs): 75.2	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 3		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						23.3
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		James Bond/Dennis Mayton		

LOCATION SKETCH/COMMENTS:



Project: Fort McClellan

bgs= below ground surface
CD= Corrected Depth
HP= Hydraulic Pressure
NA =Not applicable
psi= pounds per square inch
WP= Water Pressure

Hole no.: R24A-187-MW08

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 2 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Dry, yellowish orange SILT, little quartz rich subangular coarse Gravel, trace roots, trace Clay.	ml		Organic Vapor = 0.0ppm				Lithological description (0-45' bgs) from R24A-187-MW02
970	4	ml: Dry, yellowish orange SILT, some quartz rich subrounded coarse Gravel, some subrounded medium Sand, trace Clay.	ml						
	6	qrtzt-sh: QUARTZITE and CLAY (shale?), quartzite is fine angular gravel, reddish brown and grayish brown; clay (shale?) is reddish brown, dry.			Organic Vapor = 0.0ppm				
965	9								
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 3 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	11								
	12		qrtzt-sh						
	13								
960	14								
	15								
	16								
	17								
	18	sh: Dry, reddish brown, SHALE.	sh						
955	19	qrtzt-sh: Interbedded fine angular reddish brown and grayish brown QUARTZITE gravel and reddish brown CLAY (shale).							
	20								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 4 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21								
	22								
	23								
950	24								
	25		qrtzt-sh						
	26								
	27								
	28								
945	29								
	30								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 5 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31								
	32								
	33								
940	34								
	35		qrtzt-sh						
	36								
	37								
	38								
935	39								
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 6 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41								
	42		qrtzt-sh						
	43								
930	44								
	45	qrtzt-cl: Interbedded layers of QUARTZITE and CLAY.							
	46								
	47		qrtzt-sh						
	48								
925	49								
	50								Set 8" casing at 50' bgs

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 7 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51	mdst: MUDSTONE, soft to moderately hard, highly weathered, few clay filled veins, 60 degree fracture at 51.3' and 51.5', brown discoloration along fracture, yellowish orange to light brown discoloration on 75% of core (greenish gray).	mdst			Box 1 of 3 (50.7 to 60.6' bgs)			Run 1 (50.7 - 52.7' bgs) Ran 2.0' Rec 1.0' Loss 1.0' UL 1.0' Water rec 95% HP 475 psi WP 175 psi Time 7 min
	52	NA: No recovery.	NA						
	53	mdst: MUDSTONE, soft to moderately hard, highly weathered, several clay filled veins, fractures at 53.1', 53.5' and 54.7' all horizontal, fracture at 55' at 45 degrees, fracture zone 55.3 to 55.5', fracture at 55.7' horizontal, fracture at 56' horizontal, brown discoloration along fractures, grayish purple to greenish gray.							Run 2 (52.7 - 57.7' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.2' Water rec 95% HP 400 psi WP 150 psi Time 18 min RQD 82%
920	54								
	55		mdst						
	56								
	57								
	58	mdst: MUDSTONE, moderately hard, highly weathered, aphanitic, little silty around 60.6 to 61' interval, few white clay filled veins, fracture 58.4', 58.6', 58.8', 60.6', and 61.4' all at 30 degree angles, horizontal fracture at 62', yellowish orange to brown discoloration on fracture surfaces (medium gray to grayish purple).						CD 57.5'	Run 3 (57.7 - 62.7 bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.2' Water rec 95% HP 400 psi WP 150 psi Time 8 min RQD 84%
915	59								
	60		mdst			Box 2			

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 8 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61					of 3 (60.6 to 68.5' bgs)			
	62								
	63	mdst: MUDSTONE, interbedded with Siltstone, siltstone 63.7' to 64.6', 66.1' to 66.2', 67' to 67.7', moderately hard, highly weathered, multiple veins, fracture 63', 65.9' both horizontal, fracture 63.9', 64.8', 65.6' all at 60 degrees, fracture zone 66.8 to 67.3', 2 inch to 3 inch core fragments in zone, brown discoloration on fracture zone surfaces, grayish purple to medium gray.						CD 62.7'	Run 4 (62.7 - 67.7' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water rec 95% HP 450 psi WP 175 psi Time 12 min RQD 73%
910	64								
	65		mdst						
	66								
	67								
	68	sltst: SILTSTONE, hard, highly weathered yellowish orange to brown discoloration 50% of core, very fine grain , white clay filled veins, fracture 68.6 to 68.9 ft at 60 degrees with slickensides, fracture at 69.2', 69.8', 70.1', 70.4', 70.6', 70.9'at 20 degrees, highly fractured 71.2 to 71.9', 72.2 to 72.7' broken up probably from removal from core barrel, brown to yellowish orange discoloration along fractures, grayish purple to medium gray.						CD 67.7'	Run 5 (67.7 - 72.7' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water rec 95% WP 175 psi Time 8 min RQD 33%
905	69					Box 3 of 3 (68.5 to 75.3' bgs)			
	70		sltst						
	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW08

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 9 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	72								
	73	mdst: Silty MUDSTONE hard, highly weathered, very fine grain, highly fractured throughout, gravel size fragments 74 to 74.2', grayish purple to medium gray.	mdst					CD 72.7'	Run 6 (72.7 - 75.2' bgs) Ran 2.5' Rec 2.5' Loss 0.0' UL 0.0' Water rec 95% HP 950 psi WP 175 psi Time 7 min RQD 0%
900	74								
	75								Bottom of borehole at 75.2'.

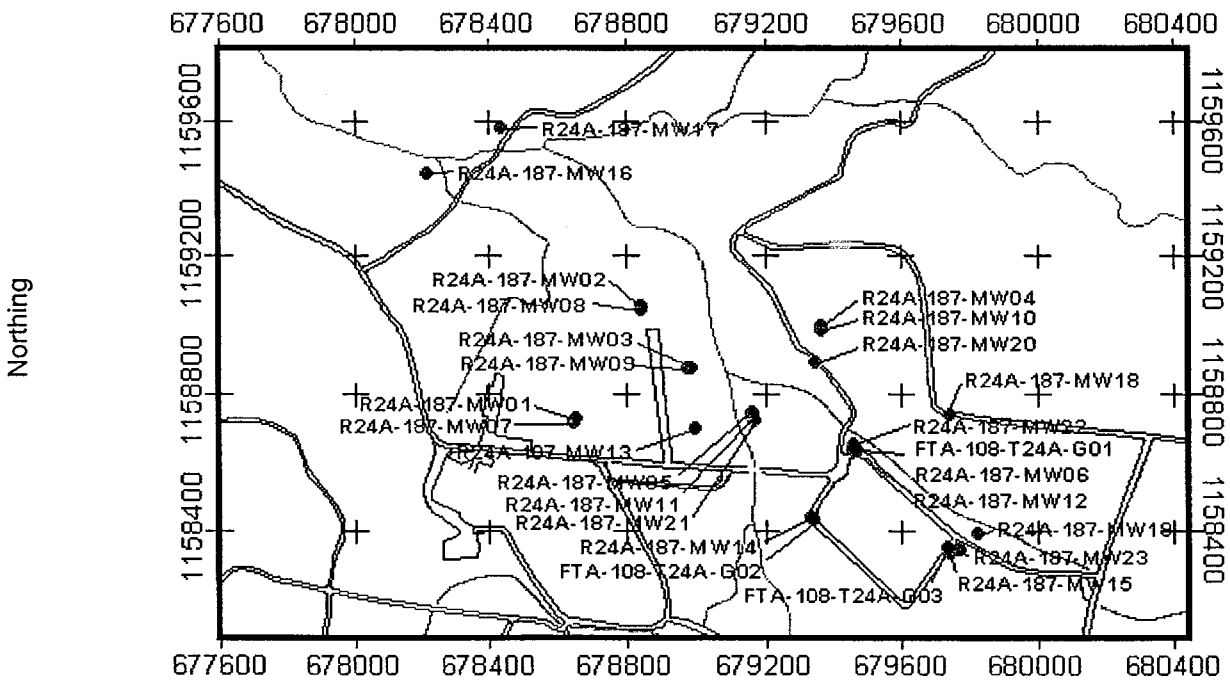
HTRW DRILLING LOG

District: **Mobile USACE**		HOLE NUMBER R24A-187-MW09
1. Company name: **IT Corporation**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 9 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Schramm T450W, CME-750
7. Sizes and types of drilling and sampling equipment: Air Percussion and Air Rotary, PQ Rock Coring AR - 12 1/4" Rotary Bit, 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 978.22 10. Date started: 11/01/00 — 11. Date completed: 11/21/00
12. Overburden thickness (feet bgs): 53	15. Depth groundwater encountered (feet bgs): 42
13. Depth drilled into rock (feet bgs): 22	16. Depth to water and elapsed time after drilling completed (feet bgs): 19.3 on 11/22/00
14. Total depth of hole (feet bgs): 75	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 2		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						17.4
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		James Bond/Dennis Mayton		

LOCATION SKETCH/COMMENTS:



Project: Fort McClellan	bgs= below ground surface CD= Corrected Depth HP= Hydraulic Pressure	NA =Not applicable psi= pounds per square inch WP= Water Pressure	Hole no.: R24A-187-MW09

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 2 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
975	0–4	ml: Dry, yellowish orange to light brown SILT, some quartz-rich subangular Gravel, trace roots.	ml						Lithological description (0-45' bgs) from R24A-187-MW03
	0–4	ml: Dry, yellowish orange to light brown SILT, little subrounded quartz-rich fine Gravel, trace subrounded fine Sand.	ml						
	4–6	ml: Yellowish orange to light gray SILT, some fine to medium Sand, little Gravel (fine weathered black shale fragments and fine to coarse quartz-rich subangular sandstone.)	ml						
	6–8	cl: Light gray CLAY, some Silt, overall slight plasticity.	cl						
970	8–10	ml: Yellowish orange to light gray SILT, some fine Sand, orange oxidation stains.	ml						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 3 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	11	cl-ml: Greenish gray moist SILT and CLAY.							
	12		cl-ml						
	13								
965									
	14	ml: Light gray to greenish gray moist SILT, little Clay.	ml						
		gp: Light gray to tan subangular coarse quartz-rich Gravel, some medium to coarse Sand.	gp						
	15	ml: Greenish gray to yellowish orange moist SILT, some fine Sand, little Clay.	ml						
	16	ml: Yellowish orange to light gray moist SILT, little Clay.							
	17		ml						
	18								
960									
	19	ml: Light gray to greenish gray moist SILT, some fine Sand, orange oxidation stains.							
	20		ml						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 4 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21	ml: Yellowish orange to light gray moist SILT, little fine quartz Sand, trace Clay.	ml						
	22								
	23								
955									
	24	ml: Greenish gray moist SILT, little very fine quartz Sand, trace Clay, orange oxidation stains, white veins.							
	25		ml						
	26	ml: Yellowish orange moist SILT, little fine Sand.							
	27								
	28		ml						
950									
	29	ml: Greenish gray moist SILT, some fine Sand, orange oxidation stains.							
	30		ml						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 5 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31	ml: Yellowish orange moist SILT, little fine Sand.							
	32		ml						
	33								
945									
	34	ml: Yellowish orange SILT, little fine Sand.							
	35								
	36								
	37								
	38								
940									
	39		ml						
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 6 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41								
	42								Groundwater encountered at 42.0' bgs
	43								
935									
	44	NA: No sample collected for lithologic description.							
	45								
	46								
	47								
	48								
930									
	49								
	50								Bottom of surface casing at 50' bgs

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 7 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51		NA						
	52								
	53	sltst: SILTSTONE/CLAYSTONE with Shale 56.5 ft to 58 ft, soft, highly weathered to decomposed fracture at 53.4, 53.6, 54.2, 54.6, all four at 45 degree angles, fracture zone 55.2 ft to 55.7 ft gravel size fragments, fracture at 56 ft at a 45 degree angle, fracture zone 56.2 ft to 56.8 ft, fracture 57 ft at horizontal, yellowish orange discoloration on weathered surfaces and fractures (medium light gray to medium gray) bedding 45 degree angle in shale interval.				Box 1 of 2 (53 to 64.5' bgs)			Run 1 (53'-58' bgs) Ran 5' Rec 4.8' Loss 0.2' UL 0.2' Water rec 95% HP 300 psi WP 100 psi Time 5 min RQD 38%
925	54								
	55								
	56		sltst						
	57								
	58	NA: No recovery.	NA						
920		sltst: SILTSTONE, soft to moderately hard, highly weathered to decomposed, fractures throughout core yellowish orange discoloration on 80% of core (medium gray).							Run 2 (58 - 63' bgs) Ran 5.0' Rec 3.4' Loss 1.6' UL 1.6' Water rec 95% HP 400 psi WP 175 psi Time 5 min RQD 0%
	59								
	60		sltst						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 8 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								
		NA: No recovery.							
	62		NA						
	63	sltst: SILTSTONE, soft to moderately hard, highly weathered to decomposed, highly fractured throughout, yellowish orange discoloration zone along fracture surface extending 2 millimeters into rock from fracture, multiple weathered Clay veins (medium gray).							Run 3 (63'-68' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.1' Water used 300 gallons, rec 95% HP 400 psi WP 150 psi Time 6 min RQD 38%
915									
	64								
						Box 2 of 2 (64.5 to 75' bgs)			
	65								
			sltst						
	66								
	67								
	68	NA: No recovery.	NA						Run 4 (68'-73' bgs) Ran 5.0' Rec 2.3' Loss 2.7' UL 2.7' Water rec 95% HP 400 psi WP 150 psi Time 5 min RQD 33%
910		sltst: SILTSTONE, soft to moderately hard, highly weathered to decomposed, 68 to 68.7 ft broken up core fragments, veins throughout filled with Clay, 90% surface weathered yellowish orange (medium gray).							
	69		sltst						
	70								
		NA: No recovery.							
			sltst NA						
	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW09

Project: Fort McClellan | Geologist: James Bond/Dennis Mayton | Sheet 9 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	72		NA						
	73	sltst: SILTSTONE, soft to moderately hard, highly weathered to decomposed, multiple clay filled veins, fracture 73.3 ft horizontal, fracture zone 73.9 to 74.3 ft, yellowish orange to brown discoloration, 1 inch brown zoning of weathering adjacent to fracture at 74.9 ft with 50 degree angle (medium gray).							Run 5 (73'-75' bgs) Ran 2.0' Rec 2.0' Loss 0.0' UL 0.0' Water rec 95% HP 400 psi WP 150 psi Time 2 min RQD 42%
905	74		sltst						
	75								Bottom of borehole at 75' bgs

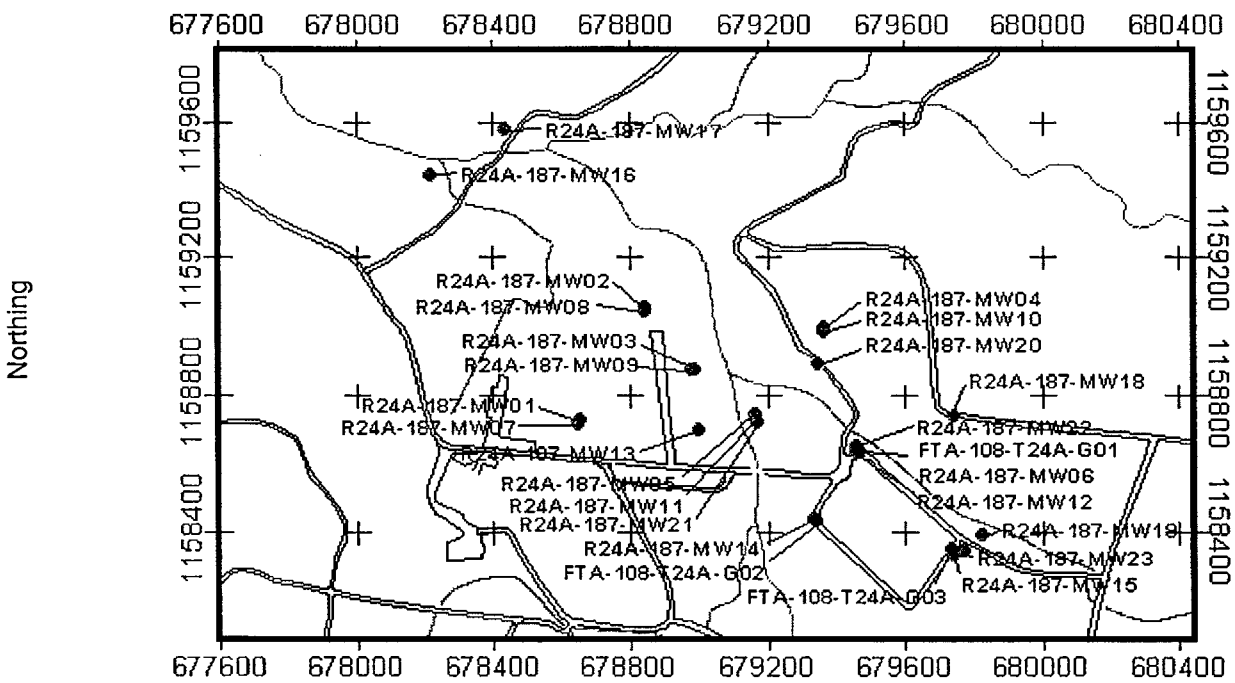
HTRW DRILLING LOG

	District: **Mobile USACE**	HOLE NUMBER R24A-187-MW10
1. Company name: **IT Corporation**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 12 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Shcramm T450W, CME-750
7. Sizes and types of drilling and sampling equipment: Air Percussion, Air Rotary, PQ Rock Coring AR - 12 1/4" Rotary Bit, 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 1010.69 10. Date started: 11/06/00 — 11. Date completed: 12/12/00
12. Overburden thickness (feet bgs): 67	15. Depth groundwater encountered (feet bgs): NA
13. Depth drilled into rock (feet bgs): 43	16. Depth to water and elapsed time after drilling completed (feet bgs): 36.55 on 12/13/00
14. Total depth of hole (feet bgs): 110	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 4		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						39.4
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		J. Bond/D. Mayton/D. Allan		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 2 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
1010	0	ml: Dry yellowish orange to light brown SILT, some quartz-rich subangular Gravel, little roots.	ml						Litholgic description (0-62' bgs) from R24A-187- MW04
	1	ml: Dry yellowish orange SILT, some quartz-rich subangular fine Gravel.							
	2		ml						
	3								
	4	ml: Dry yellowish orange SILT, little subrounded to subangular medium to coarse Sand, trace clay.							
	5								
1005	6		ml						
	7								
	8	sh: Dry yellowish orange to light tan SHALE, weathered.							
	9								
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 3 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
1000	11								
	12								
	13								
	14								
	15								
995	16		sh						
	17								
	18								
	19								
	20								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 4 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
990	21								
	22		sh						
	23								
	24	sh: Lightly moist dark gray SHALE.							
		sh: Dry dark gray SHALE.	sh						
	25		sh						
985	26								
	27								
	28								
	29								
	30								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 5 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
980	31		sh						
	32								
	33								
	34								
	35								
975	36	sh: Dry yellowish orange to tan to light gray SHALE, weathered.							
	37								
	38		sh						
	39	sh: Dry yellowish orange to tan SHALE, weathered.							
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 6 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
970	41								
	42								
	43								
	44		sh						
	45								
965	46								
	47	sh: Moist dark gray SHALE.							
	48		sh						
	49	sh: Dark gray SHALE.							
	50								
960									

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 7 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51								51
	52								52
	53								53
	54								54
	55								55
955	56		sh						56
	57								57
	58								58
	59								59
	60								60
950									

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 8 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								61
	62	sh: Dark gray SHALE.							62
	63								63
	64		sh						64
	65								65
945	66								66
	67	NA: No recovery.	NA			Box 1 of 4 (67 to 78' bgs)			67 8" outer casing at 67' Run 1(67-68' bgs) Ran 1.0' Rec 0.0' Loss 1.0' UL 1.0' Water used 300 gallons, rec 100%, light gray Time 3 min RQD 0%
	68	sh: SHALE; very soft, highly weathered, fracturing at 45 degrees, Clay to coarse gravel sized fragments within fracture zone, interbedded Silt in places, difficult to distinguish due to degree of weathering, medium dark gray.							68 Run 2 (68-73' bgs) Ran 6.0' Rec 4.7' Loss 0.3' UL 0.3' Water used 300 gallons, rec 100%, light gray Time 11 min RQD 38%
	69								69
	70		sh						70
940	71								71

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 9 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	71								
	72								
		NA: No recovery.	NA						
	73	sh: Interbedded SHALE/SILTSTONE, very soft to soft, highly to moderately weathered, bedding is banded, horizontal with slight soft sediment deformation, core breaking preferentially along bedding planes, beds offset occasionally showing evidence of small scale faulting, medium dark gray shale and yellowish gray siltstone.							Run 3 (73-78' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used 300 gallons, rec 100%, gray Time 11 min RQD 62%
	74								
	75								
935			sh						
	76								
	77								
	78	sh: Interbedded SHALE/SILTSTONE, soft, highly weathered, banded width bedding approximately 30 degrees, some soft sediment deformation, breaking along bedding planes, medium dark gray shale and yellowish gray siltstone.	sh			Box 2 of 4 (78 to 88' bgs)			Run 4 (78-83' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.3' Water used 300 gallons, rec 100%, greenish-gray Time 19 min RQD 24%
	79								
	80	sltst: SILTSTONE, moderately hard, moderately to highly weathered around fractures, fracture zones at 79.4' to 79.5' (contact with shale approximately 45 degrees, fine to coarse gravel sized fragments) 79.7' to 79.9' (horizontal fine to coarse gravel sized fragments) 80.1' to 80.4' (clay to gravel sized fragments) 80.8' (approximately 45 degrees, gravel sized fragments) 81.1' to 82.7' (approximately 45 degrees and vertical, gravel sized fragments) whole core stained with iron and manganese, dark yellowish orange, light							
930									
	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 10 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		brown, and yellowish gray.	sltst						
	82								82
		NA: No recovery.	NA						
	83	sltst: SILTSTONE, moderately hard, moderately weathered around fractures, fracture zones at 83.4' to 83.5' (45 degrees, fine to coarse gravel sized fragments), 83.8' to 83.9' (45 degrees, fine to coarse gravel sized fragments), 84.2' to 84.3' (45 degrees, clay to fine gravel sized fragments), 84.5' to 84.8' (45 degrees, clay to fine gravel sized fragments, 85.6' to 85.8' (horizontal, sand to fine gravel sized fragments), 87.5' to 88' (45 degrees, sand to coarse gravel sized fragments), core stained with iron, in unstained parts core is yellowish gray, with staining it is dark yellowish orange and light brown.						Run 5 (83-88' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used 300 gallons, rec 100%, greenish-gray Time 14 min RQD 22%	83
	84								84
	85								85
925			sltst						
	86								86
	87								87
	88	sltst: SILTSTONE, moderately hard, slightly weathered, fractures at 88.2' (45 degrees), 88.7' (45 degrees), 89.5' (45 degrees, fine to coarse gravel sized fragments), 90.1' to 91.3' (series of fractures, 45 degrees, iron and manganese and clay staining on face), 92.1' to 93' (45 degrees and vertical, staining on faces, fine to coarse gravel sized fragments), yellowish gray.				Box 3 of 4 (88 to 98' bgs)			Run 6 (88-93' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used 300 gallons, rec 100%, greenish-gray Time 12 min RQD 38%	88
	89								89
	90								
920			sltst						
	91								91

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 11 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	92								
	93	sltst: SILTSTONE, hard, slightly weathered, iron staining around fractures, fracture zones at 93.4' to 93.9' (vertical and 45 degrees, fine to coarse gravel sized fragments), 94.7' to 98' (vertical and 45 degrees, fine to coarse gravel sized fragments), yellowish gray.							Run 7 (93-98' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used 300 gallons, rec 100%, greenish-gray Time 31 min RQD 13%
	94								
	95								
915			sltst						
	96								
	97								
	98	sltst: SILTSTONE, moderately hard to hard, slightly weathered around fractures, iron and manganese staining, and white staining around fractures, fracture zones at 98' to 98.6' (vertical and 45 degrees, coarse to fine gravel fragments), 99.2' to 99.4' (45 degrees, sand to coarse gravel sized fragments), 99.9' to 100.1' (45 degrees, and vertical, fine to coarse gravel sized fragments), 100.7' to 101.6' (highly fractured, clay to coarse gravel sized fragments), yellowish gray.				Box 4 of 4 (98 to 110' bgs)			Run 8(98-103' bgs) Ran 5.0' Rec 3.6' Loss 1.4' UL 1.4' Water used 300 gallons, rec 67%, greenish-gray Time 51 min RQD 36%
	99								
	100		sltst						
910									
	101								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW10

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 12 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	102	NA: No recovery.	NA						
	103	sltst: Interbedded SILTSTONE and SHALE, shale is moderately hard, moderately weathered, fractured throughout at 80 degrees and 45 degrees, sand to coarse gravel sized fragments in fractures, bedding is banding width at 45 degrees, some soft sediment deformation, medium dark gray shale and yellowish gray siltstone.	sltst						Run 9 (103-108' bgs) Ran 5.0' Rec 4.4' Loss 0.6' Water used 200 gallons, rec 100%, greenish-gray Time 20 min RQD 14%
	104								
	105								
905	106								
	107								
	108	NA: No recovery.	NA						
	109	sltst: SILTSTONE, hard to moderately hard, slightly weathered, fractures at 80 degrees throughout, partings of Shale through core, yellowish gray siltstone and medium dark gray shale.	sltst						Run 10 (108-110' bgs) Ran 2.0' Rec 2.0' Loss 0.0' Water used 200 gallons, rec 100%, greenish-gray Time 6 min RQD 10% Bottom of borehole at 110' bgs
	110								

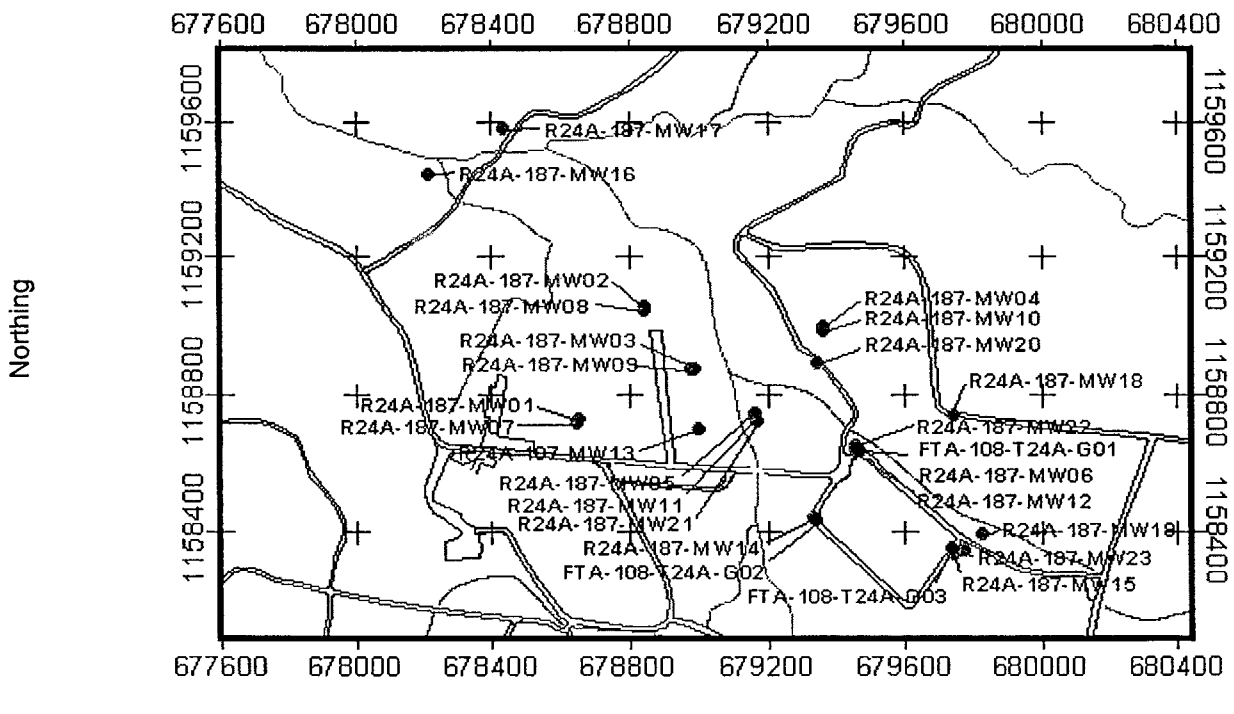
HTRW DRILLING LOG

District: Mobile USACE		HOLE NUMBER R24A-187-MW11
1. Company name: IT Corporation	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 8 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Schramm T450W, CME-750
7. Sizes and types of drilling and sampling equipment: Air Percussion, Air Rotary, PQ Rock Coring AR - 12 1/4" Rotary Bit, 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 982.12 10. Date started: 11/07/00 — 11. Date completed: 11/22/00
12. Overburden thickness (feet bgs): 51	15. Depth groundwater encountered (feet bgs): NA
13. Depth drilled into rock (feet bgs): 19	16. Depth to water and elapsed time after drilling completed (feet bgs): 30.7 on 11/28/00
14. Total depth of hole (feet bgs): 70	17. Other water level measurements (specify):

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 2		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						16.3
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		J. Bond/D. Mayton		

LOCATION SKETCH/COMMENTS:



Project: Fort McClellan

bgs= below ground surface
CD= Corrected Depth
HP= Hydraulic Pressure
NA =Not applicable
psi= pounds per square inch
WP= Water Pressure

Hole no.: R24A-187-MW11

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW11

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 2 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Brown SILT, little Sand, some coarse to fine quartz-rich Gravel, trace roots.	ml						Lithologic description (0-51' bgs) from R24A-187-MW05
	1	ml: Brown SILT, little Sand, little quartz-rich coarse angular gravel.	ml						
980	2								
	3	NA: No sample collected for litholoigc description.							
	4	sh: Dry olive gray to yellowish orange SHALE.	sh						
	5	NA: No sample collected for litholoigc description.	NA						
	6								
975	7								
	8								
	9	sh: Dry dark gray SHALE.	sh						
	10	NA: No sample collected for litholoigc							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW11

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 3 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		description.							
	11		NA						
970	12								
	13								
	14	sh: Lightly moist dark gray SHALE.	sh						
		NA: No sample collected for litholoigc description.							
	15								
	16								
965	17		NA						
	18								
	19	sh: Dry dark gray SHALE.	sh						
	20	NA: No sample collected for litholoigc							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW11

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 4 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		description.							
	21								21
960	22								22
	23								23
	24								24
	25		NA						25
	26								26
955	27								27
	28								28
	29								29
	30								30

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW11

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 5 of 8 sheets

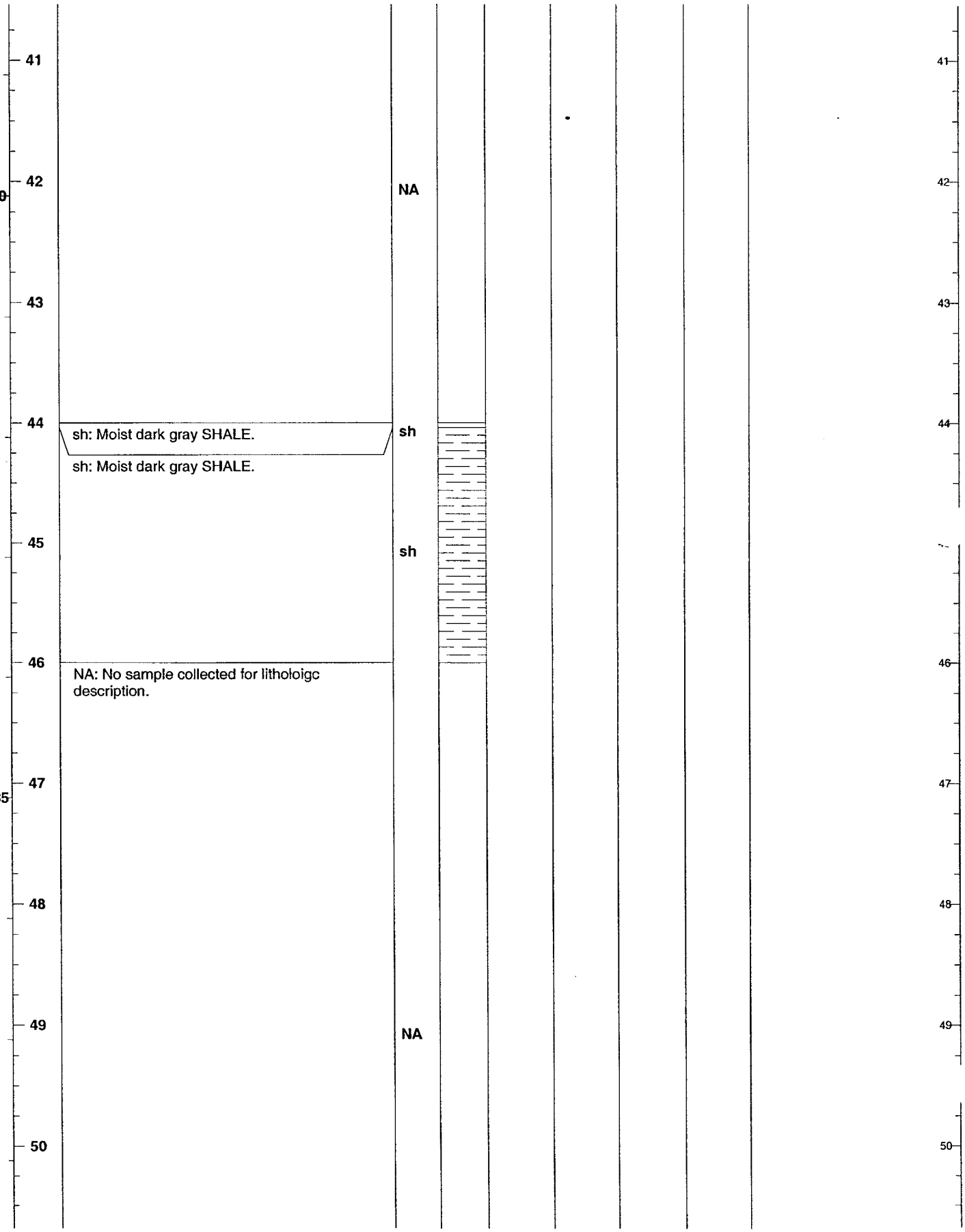
Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31								
950	32								
	33								
	34								
	35		NA						
	36								
945	37								
	38								
	39	sh: Moist cuttings, dark gray SHALE.	sh						
	40	NA: No sample collected for litholoigc description.	NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW11

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 6 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
940	42	sh: Moist dark gray SHALE.	sh						
	44	sh: Moist dark gray SHALE.	sh						
	46	NA: No sample collected for litholoigc description.	NA						
935	47								
	49		NA						
	50								



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW11

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 7 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51	NA: No lithologic description.	NA						
930	52	sh: SHALE, moderately hard, slightly weathered, several Silt with trace amount of quartz filled seams, one seam contoured with a recumbent fold at 51.7', 1/4 inch displacement of seams, highly fractured throughout, 60 degree angle, fracture zone 54' to 56.5', fissile, medium dark gray to dark gray, bedding 20 degree angle.			Organic Vapor = 0.0ppm	Box 1 of 2 (51.5 to 61.4' bgs)			Run 1 (51.5-56.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' Water used 150 gallons, rec 95% HP 600 psi WP 200 psi RQD 14%
	53								
	54		sh						
	55								
	56								
925	57	sh: SHALE, moderately hard, slightly weathered, Silt with trace quartz filled contoured 1/4 inch offset seams, fracture throughout, fissile, dark gray, bedding 20 degree angle.	sh					CD 56.4' CD 57.0'	Run 2 (56.5-57.3' bgs) Ran 0.8' Rec 0.6' Loss 0.2' UL 0.0' Water used 150 gallons, rec 95% HP 600 psi WP 200 psi Time 5 mins RQD 0%
	58	sh: SHALE, moderately hard, slightly weathered, contoured silt with trace quartz filled seams having 1/4-inch displacement, fractured throughout core at 60 degree angle, fracture zone 58.9' to 59.3', 59.5' to 59.7', 61.1' to 61.8', fissile, medium dark gray to dark gray, bedding 30 degree angle, fractures moderately weathered fractures.							Run 3 (57.3-62.3' bgs) Ran 5.0' Rec 4.5' Loss 0.5' Ul 0.0' Water used 150 gallons, rec 95% HP 600 psi WP 200 psi RQD 13%
	59		sh						
	60								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW11

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 8 of 8 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								61
920	62	sh: SHALE, moderately hard, slightly weathered, Silt with trace quartz filled seams, fracture zone all of core with gravel size fragments, fissile, dark gray bedding 30 degree angle, slickensides at 63.9'.	sh		Organic Vapor = 0.0ppm	Box 2 of 2 (61.4 to 70' bgs)		CD 61.8'	62 Run 4 (62.3-67.3' bgs) Ran 5.0' Rec 4.3' Loss 0.7' UL 0.9'
	63								63 Water used 150 gallons, rec 75% WP 200 psi Time 25 mins RQD 0%
	64								64
	65								65
	66	NA: No recovery.	NA						66
915	67	sh: SHALE, moderately hard to soft, moderately weathered to highly weathered, Silt with trace quartz seams with 1/2 inch displacement, fracture zone 68.1' to 68.6' (gravel size shale fragments), dark gray, bedding horizontal to 25 degree angle, fissile.	sh					CD 67.0'	67 Run 5 (57.3-70.0' bgs) Ran 2.7' Rec 2.0' Loss 0.7' UL 1.0'
	68								68 Water used 150 gallons, rec 80% HP 450 psi WP 200 psi Time 8 mins RQD 31%
	69	NA: No recovery.	NA						69
	70								Bottom of borehole at 70' '

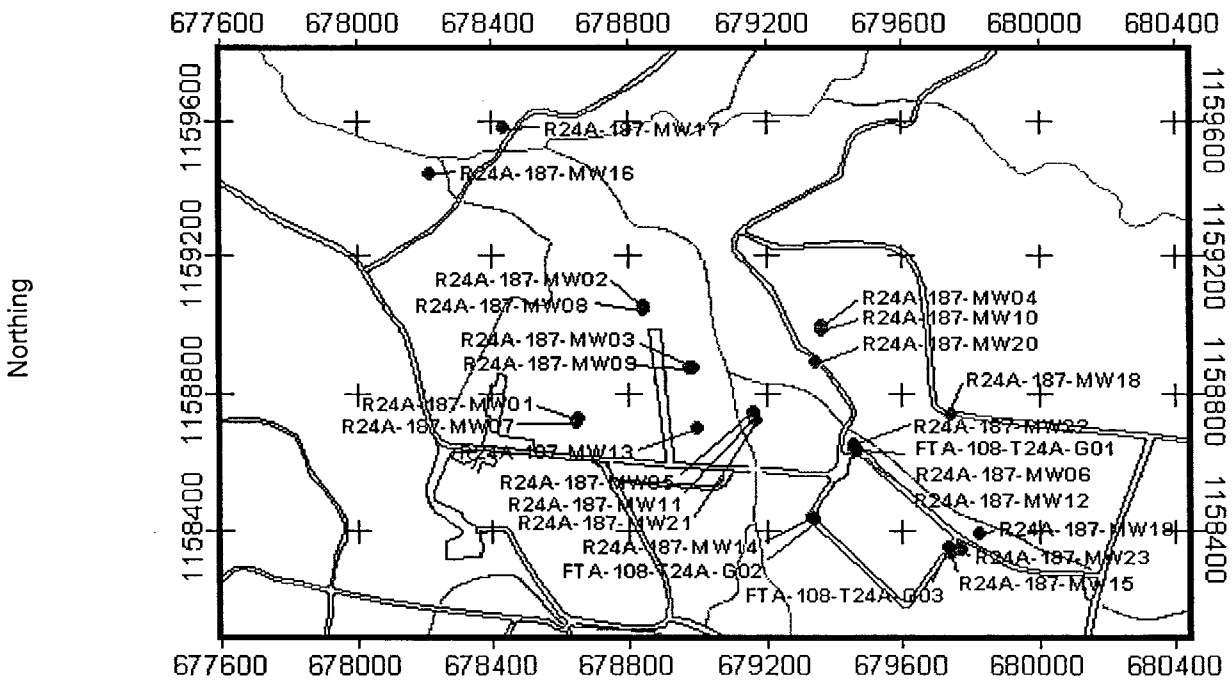
HTRW DRILLING LOG

	District: **Mobile USACE**	HOLE NUMBER R24A-187-MW12
1. Company name: **IT Corporation**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 16 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Schramm T450W, CME-750
7. Sizes and types of drilling and sampling equipment: Air Percussion, Air Rotary, PQ Rock Coring AR - 12 1/4" Rotary Bit, 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 1005.72 10. Date started: 10/30/00 — 11. Date completed: 11/20/00
12. Overburden thickness (feet bgs): 80	15. Depth groundwater encountered (feet bgs): 80
13. Depth drilled into rock (feet bgs): 67	16. Depth to water and elapsed time after drilling completed (feet bgs): 50.7 on 11/21/00
14. Total depth of hole (feet bgs): 147	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 2		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						13.6
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		J. Bond/D. Mayton		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 2 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
1005	0	NA: No sample collected for lithologic description.							Lithologic description (0-59' bgs) from R24A- 187-MW06.
	4	sh: Dry yellowish orange to tan SHALE, weathered.	sh						
		NA: No recovery.	NA						
		NA: No sample collected for lithologic description.							
1000	10		NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 3 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		sh: Dry medium gray SHALE.	sh						
		NA: No recovery.	NA						
995	11	NA: No sample collected for lithologic description.							
	12								
	13								
	14								
	15		NA						
990	16								
	17								
	18								
	19								
	20								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 4 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
985	21								
	22								
	23								
	24								
	25		NA						
980	26								
	27								
	28								
	29								
	30	sh: Dry dark gray SHALE.	sh						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 5 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
975	31	NA: No sample collected for lithologic description.	NA						
	32								
	33								
	34								
	35								
970	36								
	37								
	38								
	39								
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 6 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
965	41								41
	42								42
	43								43
	44								44
	45		NA						
960	46								46
	47								47
	48								48
	49								49
	50	sh: Dry dark gray SHALE.	sh						50
		NA: No recovery.	NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 7 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
955	51	NA: No sample collected for lithologic description.	NA						
	52	sh: Dark gray SHALE.							
	53								
	54								
	55								
950	56		sh						
	57								
	58								
	59	sh: Dark gray SHALE.							Descriptions from 59 to 105 taken from air rotary cutting returns
	60		sh						
945									

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 8 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								
	62								
	63								
	64								
	65		sh						
940	66								
	67								
	68								
	69								
	70								
935	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 9 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	71								
	72								
	73								
	74		sh						
	75								
930	76								
	77								
	78								
	79								
	80	qrtzt: Light gray to olive gray QUARTZITE with quartz veins, cuttings were fine angular gravel, fractures at 80'.	qrtzt						Drilling very hard in this zone
925	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 10 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	82								
	83								
	84								
	85								
920	86		qrtzt						
	87								
	88								
	89								
	90								
915	91								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 11 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	92								
	93								
	94								
	95								
910	96		qrtzt						
	97								
	98								
	99								
	100								Flushed casing with 200 gallons potable water
905	101								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 12 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	102								
	103								
	104								Set 8" ID casing at 105'
	105	NA: No lithologic description due to no recovery.							Noted coarse gravel fragments of QUARTZITE obtained while cleaning borehole, greenish gray.
900	106		NA						
	107								
	108	qrtzt: QUARTZTIE and MUDSTONE interbedded, quartzite is hard, slightly weathered, fine grain, highly fractured, horizontal and vertical, orange color evidence of oxidation on fractures, multiple quartz filled fractures, greenish gray, no swelling, claystone is moderately hard, moderately weathered, possible vertical fracture due to orange oxidation on side, dark greenish gray, no swelling, core is highly fractured and broken.	qrtzt		Organic Vapor = 0.0ppm	Box 1 of 2 (108 to 133' bgs)			Run 1 (108-113' bgs) Ran 5.0' Rec 1.5' Loss 3.5' UL 2.5' Water color brown HP 400 psi WP 100 psi Time 56 mins RQD 0%
	109								
	110	NA: No recovery.							
895	111		NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 13 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	112	qrtzt: QUARTZITE, hard, slightly to moderately weathered, fine to medium grain (predominately fine), highly fractured, horizontal, vertical, and 45 degree angle, grayish red, no swelling, no bedding.	qrtzt		Organic Vapor = 0.0ppm			CD 112'	
	113	NA: No recovery.							Run 2 (113-118' bgs) Ran 5.0' Rec 1.0' Loss 4.0' UL 4.0' HP 500 psi WP 100 psi
	114								
	115								Time 13 mins RQD 7%
890			NA						
	116								
	117	qrtzt: QUARTZITE, hard, moderately weathered, fine to medium grain (predominately fine grain) highly fractured, 30 to 75 degree angles, orange oxidation in fractures, black colors in fractures silica cement, no swelling, no bedding.	qrtzt		Organic Vapor = 0.0ppm			CD 117'	
	118	NA: No recovery.							Run 3 (118-123' bgs) Ran 5.0' Rec 1.0' Loss 4.0' UL 3.5' HP 500 psi WP 100 psi Time 7 mins RQD 7%
	119								
	120								
885			NA						
	121							CD	

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 14 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	122							121.5'	
	123	NA: No recovery.			Organic Vapor = 0.0ppm				Run 4 (123-128' bgs) Ran 5.0' Rec 0.0' Loss 5.0' UL 5.5' HP 500 psi WP 100 psi Time 10 mins RQD 0%
	124								
	125		NA						
880									
	126								
	127	qrtzt: QUARTZITE, hard, slightly weathered, fine to medium grain (predominately fine grain), fracture zone at 28.7' and 29.2', 30 degree angle at 28.7' and horizontal at 29.2', greenish gray.						CD 127'	
	128		qrtzt		Organic Vapor = 0.0ppm				Run 5 (128.0-130.4' bgs) Ran 2.4' Rec 1.9' Loss 0.5' UL 1.3' HP 400 psi WP 100 psi Time 9 mins RQD 26%
	129	NA: No recovery.							
			NA						
	130								
		sh: CLAY and SHALE, soft, highly weathered, clay size grains, unable to determine fractures due to weathering, medium gray, shale weathered into clay.	sh					CD 130.2'	Run 6 (130.4-133.0' bgs) Ran 2.6' Rec 2.6' Loss 0.0' UL 0.0 HP 400 psi WP 100 psi Time 13 mins RQD 66%
875									
	131	sh: SHALE, moderately hard, slightly weathered clay size grains, fractures at 131 ft at 40 degree angle, 131.5' at 20 degree angle, fracture zone 131.8 to 132.1 at 60 degree angle, fracture at 132.4' horizontal, some clay in filling of fractures, multiple veins throughout, medium dark gray, bedding near 25 degree	sh						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 15 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	132	angle.							
	133	sh: SHALE (layer of quartzite at 136.2 to 136.5') shale is moderately hard, slightly weathered, clay size grains, some clay filled veins throughout, few quartz veins, fractures at 133.2', 133.5', 134' near horizontal, fractures at 134.5' at 30 degree angle, fracture zone 135.2' to 135.5' and 135.7' to 136', medium gray, bedding 30 degrees, quartzite layer (136.2' to 136.5') hard, slightly weathered, fine to medium grain (predominately fine), quartz veins, greenish gray, 136..5' to 137.5' shale fragments (fine gravel size).			Organic Vapor = 0.0ppm	Box 2 of 2 (133 to 147' bgs)		CD 132.8'	Run 7 (133-138' bgs) Ran 5.0' Rec 4.5' Loss 0.5' UL 0.7' HP 400 psi WP 200 psi Time 20 mins RQD 31%
	134								
	135								
870			sh						
	136								
	137								
	138	NA: No recovery.						CD 138'	Run 8 (138-140.3' bgs) Ran 2.3' Rec 0.0' Loss 2.3' UL 2.3' HP 400 psi WP 100 psi Time 30 mins RQD 0%
	139		NA						
	140								
865		NA: No recovery.						CD 140.3'	Run 9 (140.3-143' bgs) Ran 2.7' Rec 0.0' Loss 2.7' UL 2.7' HP 400 psi WP 100 psi Time 21 mins RQD 0%
	141								
	142		NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW12

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 16 of 16 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
860	143	qrtzt: QUARTZITE, hard, slightly to moderately weathered, fine to medium grain, poor core quality, unable to identify fractures, oxidation present on some surfaces, dusky yellow, no swelling, no bedding.	qrtzt		Organic Vapor = 0.0ppm			CD 143'	Run 10 (143-147' bgs) Ran 4.0' Rec 0.9' Loss 3.1' UL 3.1' Water rec 50% HP 400 psi WP 100 psi Time 65 mins RQD 0%
	144								
	145								
	146								Bottom of borehole at 146' bgs
	147								

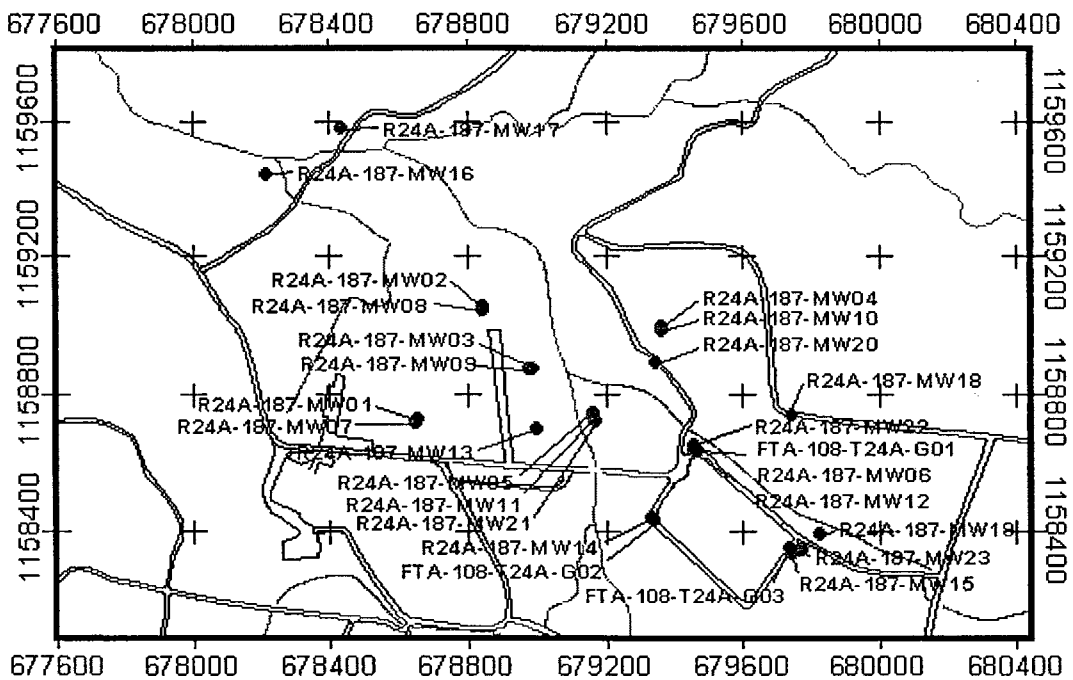
HTRW DRILLING LOG

District: Mobile USACE		HOLE NUMBER R24A-187-MW13
1. Company name: IT Corporation	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 9 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Schramm T450W, CME-750
7. Sizes and types of drilling and sampling equipment: Air Percussion, Air Rotary, PQ Rock Coring AR - 12 1/4" Rotary Bit, 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 982.48 10. Date started: 11/02/00 — 11. Date completed: 11/28/00
12. Overburden thickness (feet bgs): 27	15. Depth groundwater encountered (feet bgs): NA
13. Depth drilled into rock (feet bgs): 48	16. Depth to water and elapsed time after drilling completed (feet bgs): 23.92 on 12/01/00
14. Total depth of hole (feet bgs): 75	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 3		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						25.2
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		J. Bond/D. Mayton/D. Allan		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 2 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
980	0–3	NA: No sample collected for lithologic description	NA						Lithologic description from FTA-108-GP05 (0-25' bgs)
	6	qrtzt: Quartzite seam (6.0'-6.5'), hard, glassy clear to purple.	qrtzt						
		ml: Light brown, dry SILT.							
975	7–10		ml						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 3 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	11								
	12	ml: Light gray, dry SILT. Trace of light gray extremely weathered Shale fragments.							
970	13								
	14		ml						
	15								
	16								
	17	ml: Light gray to brown SILT. A weathered, hard, medium to coarse grained Quartz Sandstone fragment, angular, vitreous, approximately 2.5 cm. in diameter.							
965	18		ml						
	19	ml: Light brown to gray, moist SILT. At 27' turning tan to gray.	ml						
	20								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 4 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21								
	22								
960			ml						
	23								
	24								Borehole caved after removal of air hammer, reamed to 24' with hollow-stem auger.
	25	cl: CLAY, brown, some Silt, trace fine Sand, trace fine angular Gravel (quartzite), dry to moist.							Description from air rotary drill cuttings (25-33' bgs)
	26								
	27								
955			cl						
	28								
	29								
	30								Bottom of 8" ID casing at 30' bgs

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 5 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
									Attempted run from 30-33', no core, used 300 gal water
	31								
	32								
950	33	sltst: SILTSTONE, hard, highly weathered, weathered area yellowish orange to brown on 90% of recovery, 75% of recovery is gravel size fragments, medium gray.	sltst			Box 1 of 3 (33 to 48' bgs)		CD 33'	Run 1 (33-38' bgs) Ran 5.0' Rec 1.0' Loss 4.0' UL 4.0' Water rec 95% HP 400 psi WP 175 psi Time 9 min RQD 0%
	34	NA: No recovery							
	35		NA						
	36								
	37								
945	38	ss: SANDSTONE interbedded with Siltstone, siltstone interval 40 to 40.3' and 41.2 to 41.6', siltstone moderately hard, sandstone very hard, highly weathered, fine grain, few quartz filled veins, fractures throughout, horizontal to 60 degree angle, black weathering on fracture surfaces. Slickensides at 40.6 degree angle, dark reddish brown.						CD 38'	Run 2 (38-43' bgs) Ran 5.0' Rec 3.6' Loss 1.4' UL 1.4' Water rec 95% HP 500 psi WP 125 psi Time 26 min RQD 0%
	39		ss						
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 6 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41		ss						
	42								
940	43	ss: SANDSTONE interbedded with Siltstone, siltstone interval 43 to 43.4', 43.6 to 44.5', 44.8 to 46.3', siltstone moderately hard, sandstone very hard, highly weathered, fine grain, fracture 43.3', 43.5', 43.7', 44.2', all four at 30 degree angles, 45.3' fracture horizontal fracture zone 46.1 to 46.4', yellowish orange to medium gray.						CD 43'	Run 3 (43-48' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.2' Water rec 95% HP 500 psi WP 175 psi Time 19 min RQD 58%
	44								
	45		ss						
	46								
	47								
935	48	ss: SANDSTONE interbedded with Siltstone, siltstone interval 48 to 48.3' and 50.5 to 51', hard to moderately hard, highly weathered, fine grain, white clay filled veins, fracture 48.2', 50.2', horizontal, 48.8', 50.1' at horizontal fracture 50.2', 50.5', 50.9' at 60 degree angles, broken up at end of core barrel, clay layer 49.7 to 50', dark yellowish orange.				Box 2 of 3 (48 to 58' bgs)		CD 47.9'	Run 4 (48-53' bgs) Ran 5.0' Rec 4.3' Loss 0.7' UL 0.8' Water rec 95% HP 500 psi WP 125 psi Time 6 min RQD 36%
	49								
	50		ss						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 7 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51								
	52								
930	53	ss: SANDSTONE interbedded with silty Claystone, Quartzite fine to medium grain quartzite at 56.7 to 57.5' interval, sandstone 53 to 53.3', 55.8 to 56.2', moderately hard to very hard, moderately to highly weathered, weather surfaces yellowish orange discoloration, fracture 53.4', 53.6', 54.1', 54.7', 55.1' at 30 degree angle, fracture zone 55.3' to 56.2', 56.7' to 57.5' with gravel size fragments, greenish gray to medium gray.	ss					CD 53'	Run 5 (53-58' bgs) Ran 5.0' Rec 4.5' Loss 0.5' UL 0.5' Water rec 95% HP 500 psi WP 125 psi RQD 32%
	54								
	55								
	56								
	57								
925	58	sltst: SILTSTONE interbedded with quartzite, hard to very hard, moderately weathered with seams of fine grain quartz between 58 to 60.5' interval, quartzite fine to medium grain 60.5 to 61', 61.8 to 61.9', 62.4 to 62.6', fracture 58.8 at 75 degrees with white Clay and yellowish orange discoloration, fracture 59.6', 60.4' at 30 degree angle, fracture zone 60.6 to 61.3', yellowish orange and black on fracture surface, fracture zone 61.9' to 62.2', greenish gray to medium gray.	sltst			Box 3 of 3 (58 to 75' bgs)			Run 6 (58-63' bgs) Ran 5.0' Rec 4.6' Loss 0.4' UL 0.4' Water rec 33%, lost 200 gallons HP 500 psi WP 100-175 psi Time 16 min RQD 48%
	59								
	60								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 8 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								
	62								
920									
	63	qrtzt: QUARTZITE, very hard, slightly weathered, medium to coarse grained, angular, well cemented, massive, evidence of fractures at unknown angles, iron and manganese staining along fracture, very light gray, no areas of swelling.	qrtzt					CD 63'	Run 7 (63-68' bgs) Ran 5.0' Rec 0.9' Loss 4.9' UL 4.9' Water used 2000 gallons, rec 0%, light brown Time 174 min RQD 0%
	64	NA: No recovery							
	65								
	66		NA						
	67								
915									
	68	qrtzt: QUARTZITE, very hard, moderately weathered, medium to coarse grained, angular, well cemented, iron and manganese stained, very light gray, strained dusky brown to moderate brown, and black.	qrtzt						Run 8 (68-73' bgs) Ran 5.0' Rec 1.0' Loss 4.0' UL 4.0' Water used 200 gallons, rec 95%, light brown Time 13 min RQD 0%
	69	NA: No recovery							
	70								
	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW13

Project: Fort McClellan | Geologist: J. Bond/D. Mayton/D. Allan | Sheet 9 of 9 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
910	72		NA						
	73	mdst: MUDSTONE, moderately hard, moderately weathered, some Silt, some Quartzite gravel fragments, greenish gray to medium gray.	clst						Run 9 (73-75' bgs) Ran 2.0' Rec 0.6' Loss 1.4' UL 1.4' Water used 200 gallons, rec 75%, light brown Time 4 mins RQD 0%
	74	NA: No recovery	NA						
	75								Bottom of borehole at 75' bgs

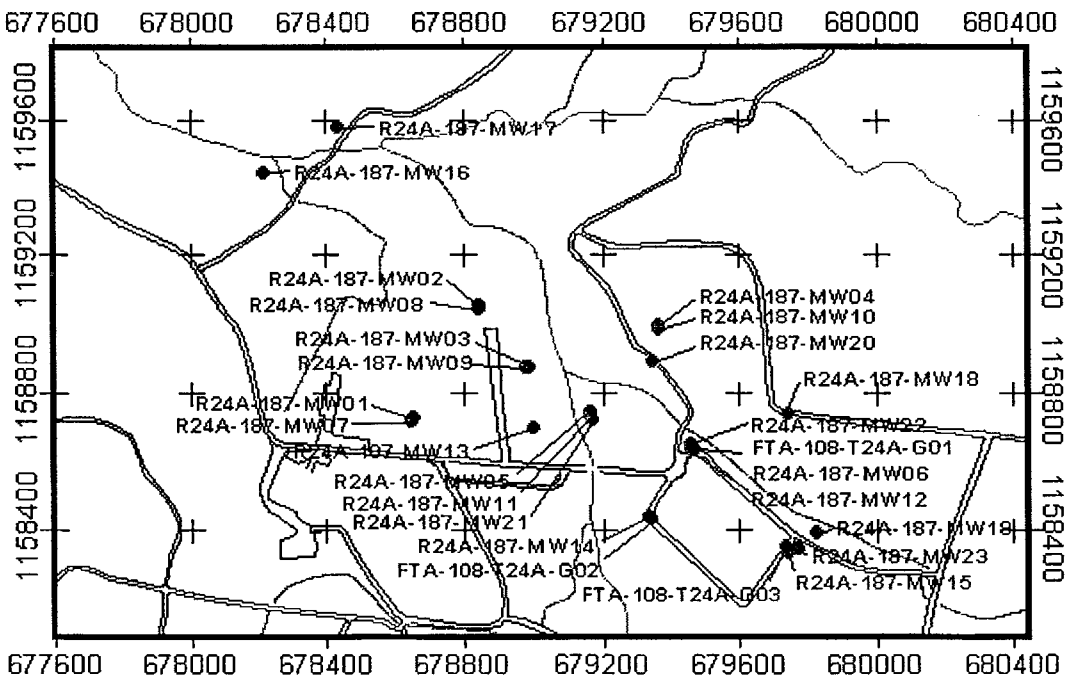
HTRW DRILLING LOG

	District: **Mobile USACE**	HOLE NUMBER R24A-187-MW14
1. Company name: **IT Corporation**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 11 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Red McNeil, Ken Gobell	6. Mfr. designation of drill: Schramm T450W, CME 750
7. Sizes and types of drilling and sampling equipment: Air Percussion, Air Rotary, PQ Rock Coring AR - 12 1/4" Rotary Bit, 7 7/8" Percussion Bit PQ - 5'x4" PQ3 wireline core barrel	8. Hole location: Training Area T-24A, Parcel 187 9. Surface elevation (feet above mean sea level): 1005.3 10. Date started: 11/01/00 — 11. Date completed: 11/20/00
12. Overburden thickness (feet bgs): 0	15. Depth groundwater encountered (feet bgs): NA
13. Depth drilled into rock (feet bgs): 100.2	16. Depth to water and elapsed time after drilling completed (feet bgs): 49.5 on 11/21/00
14. Total depth of hole (feet bgs): 100.2	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 7		
	NA					
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
						59.8
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
		X		J. Bond/D. Mayton		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW14

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 2 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
1005	0	sh: Yellowish brown, weathered SHALE, dry.	sh						Lithologic descriptions from air rotary cutting returns (0-38' bgs)
	1								
	2								
	3								
	4								
1000	5								
	6								
	7								
	8								
	9								
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW14

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 3 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
995	11								
	12		sh						
	13								
	14								
	15								
990	16	sh: Gray, weathered SHALE, dry.							
	17								
	18		sh						
	19								
	20								

HTRW DRILLING LOG (Continuation Sheet)

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Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 4 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
985	21								
	22								
	23								
	24								
	25		sh						
980	26								
	27								
	28								
	29								
	30								
975									

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW14

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 5 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31								
	32								
	33								
	34		sh						
	35								
970									
	36								
	37								
	38	NA: No lithologic description provided.	NA						Bottom of casing at 38'.
	39	sh: SHALE, moderately hard, slightly weathered, closed infilled fractures with quartz throughout core with 20 degree angles, fracture at 39.4', 39.7' with 60 degree angle, fracture at 40.3' near horizontal, fracture zone 40.5' to 40.8', fracture at 41', 41.5', 41.7' at 60 degree angles, bedding near 20 degree angle, medium dark gray, fissile.	sh			Box 1 of 7 (39 to 49.4' bgs)		CD 39'	Run 1 (39-42.5' bgs) Ran 3.5' Rec 2.9' Loss 0.6' UL 0.6' HP 600 psi WP 200 psi Time 16 min RQD 28%
	40								
965									

HTRW DRILLING LOG (Continuation Sheet)

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Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 6 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41		sh		Organic Vapor = 0.0ppm				
	42								
	43	sh: SHALE, moderately hard, slightly weathered closed filled fracture with quartz throughout core at horizontal to 20 degrees, fracture zone 43' to 43.2', fractures at 43.5' to 43.6', 44', 44.2', 45', 46.5', fracture zone 45.5' to 45.7', medium dark gray to dark gray bedding near 20 degree angle, fissile.			Organic Vapor = 0.0ppm			CD 42.5'	Run 2 (42.5-47.5' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.2' HP 600 psi WP 200 psi Time 13 min RQD 46%
	44								
960	45		sh						
	46								
	47								
	48	sh: SHALE, moderately hard, slightly weathered, few infilled veins with quartz fracture zone 47.5' to 48.1', 48.6' to 49.1', 50 to 50.5', fracture at 51.5' bedding 20 degree angle, fissile, medium dark gray to dark gray.			Organic Vapor = 0.0ppm			CD 47.4'	Run 3 (47.5-52.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' HP 600 psi WP 200 psi Time 13 min RQD 52%
	49					Box 2 of 7 (49.4 to 59' bgs)			
955	50		sh						

HTRW DRILLING LOG (Continuation Sheet)

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Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 7 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51								
	52								
	53	sh: SHALE, moderately hard, slightly weathered, several quartz filled veins throughout core, fracture at 53.9' at 30 degree angle, 54.7', fracture zone 55.2' to 55.4', fracture zone 55.8' to 56.2', fracture at 56.5', 56.7', 56.9', bedding horizontal at 20 degree angle, fissile, medium dark gray to dark gray.						CD 52.4'	Run 4 (52.5-57.5' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0' HP 600 psi WP 200 psi Time 15 min RQD 57%
	54								
	55		sh		Organic Vapor = 0.0ppm				
950									
	56								
	57								
	58	sh: SHALE, moderately hard, slightly weathered, few infilled quartz veins, fracture zone 58.1' to 58.5', fracture at 58.9', 60.5', 61.3', 61.7', 62.3', bedding near horizontal to 20 degree angle, fissile, medium dark gray to dark gray.						CD 57.4'	Run 5 (57.5-62.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.1' HP 600 psi WP 200 psi Time 15 min RQD 83%
	59				Organic Vapor = 0.0ppm	Box 3 of 7 (59' to 68.5' bgs)			
	60		sh						
945									

HTRW DRILLING LOG (Continuation Sheet)

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Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 8 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								
	62	NA: No recovery.	NA					CD 62.5'	Run 6 (62.5-67.5' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.2' Water rec 100% HP 600 psi WP 200 psi Time 14 min RQD 43%
	63	sh: SHALE, moderately hard, slightly weathered, few quartz filled veins, fractures parallel to bedding at 62.7' to 62.8', 63.2', 63.4', 66.9', fracture zone 64' to 64.4' (fine to coarse gravel size shale fragments with small area of iron oxidation) fracture at 66.1', 65.8', 66.3', fissile, medium dark gray to dark gray, bedding horizontal to 20 degree angle.							
	64								
	65		sh		Organic Vapor = 0.0ppm				
940									
	66								
	67								
	68	NA: No recovery.	NA					CD 67.5'	Run 7 (67.5-72.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' HP 600 psi WP 200 psi Time 13 min RQD 38%
	69	sh: SHALE, moderately hard, unweathered to slightly weathered, few quartz filled veins, fracture at 67.9', 68.5', 69', 69.2', 69.8', 71.7', fracture zone 70.2' to 70.5', 71.1' to 71.4', fissile, medium dark gray to dark gray, bedding horizontal to 20 degree angle.			Organic Vapor = 0.0ppm	Box 4 of 7 (68.5 to 77.9' bgs)			
	70		sh						
935									
	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW14

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 9 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	72								
	73	sh: SHALE, moderately hard, unweathered to slightly weathered, several quartz filled veins, fracture zone 72.6' to 72.8', 73.8' to 74', 75' to 75.2', 76.8' to 77', multiple fractures parallel to bedding, fissile, medium dark gray to dark gray, bedding horizontal to 20 degree angle.			Organic Vapor = 0.0ppm			CD 72.5'	Run 8 (72.5-77.5' bgs) Ran 5.0' Rec 4.7' Loss 0.3 UL 0.1' HP 600 psi WP 200 psi RQD 24%
	74								
930	75		sh						
	76								
	77								
	78	sh: SHALE, moderately hard, unweathered to slightly weathered, several quartz filled veins, fracture zone 77.8' to 77.9', 78.3' to 78.4' (fine gravel size shale fragments in zone), vertical closed fracture 78.4' to 79.1', closed vertical fracture 80.4' to 80.9', fracture zone 81.3' to 82', medium dark gray to dark gray, fissile, bedding at 10 degree angle.			Organic Vapor = 0.0ppm	Box 5 of 7 (77.9 to 87.5' bgs)		CD 77.3'	Run 9 (77.5-82.5' bgs) Ran 5.0' Rec 5.4' Gain 0.4' UL 0.0' HP 600 psi WP 200 psi Time 13 min RQD 60%
	79								
925	80		sh						
	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW14

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 10 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	82								
	83	sh: SHALE, moderately hard, unweathered to slightly weathered, several quartz filled veins throughout core, fractures parallel to bedding at 82.8', 84', 83.4', 86.8', fracture 84.3' and 85.1' at 60 degree angle, fracture zone 85.5' to 85.7', fissile, medium dark gray to dark gray, bedding horizontal to 20 degree angle.			Organic Vapor = 0.0ppm			CD 82.7'	Run 10 (82.5-87.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' HP 600 psi WP 200 psi Time 13 min RQD 52%
	84								
920	85		sh						
	86								
	87								
	88	sh: SHALE, moderately hard, unweathered to slightly weathered, few quartz veins mostly horizontal, fracture zone 88' to 88.5', 89.7' to 89.8' (gravel size shale fragments and clay) , vertical fracture 88.5' to 88.9', 90 to 91' fracture along bedding 87.6', 91.1', 92', fissile, medium dark gray to dark gray, bedding 10 degree angle.			Organic Vapor = 0.0ppm	Box 6 of 7 (87.5 to 96.5' bgs)		CD 87.5'	Run 11 (87.5-92.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' HP 600 psi WP 200 psi Time 14 min RQD 53%
	89								
915	90		sh						
	91								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: R24A-187-MW14

Project: Fort McClellan | Geologist: J. Bond/D. Mayton | Sheet 11 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	92								
	93	sh: SHALE, moderately hard, unweathered to slightly weathered, several quartz filled veins throughout core, fracture parallel to bedding at 93.5' to 93.8', 95.9', fracture zones at 94 to 94.2' (gravel size shale fragments, fracture at 60 degree angle at 93.7', 94.7', 95.4', 97', fissile, medium dark gray to dark gray, bedding near horizontal to 10 degree angle.	sh		Organic Vapor = 0.0ppm	Box 7 of 7 (96.5 to 100.2' bgs)		CD 92.5'	Run 12 (92.5-97.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' HP 600 psi WP 200 psi Time 14 min RQD 72%
	94								
910	95								
	96								
	97								
	98	sh: SHALE, moderately hard, unweathered few quartz filled veins parallel to bedding, fracture parallel to bedding at 98.5', 99.1', 99.3', fine gravel sized shale fragments and iron oxidation weathering at 99.3', 60 degree angle on fracture at 98.7', medium dark gray to dark gray bedding near 10 degree angle, fissile.	sh		Organic Vapor = 0.0ppm			CD 97.5'	Run 13 (97.5-100.2' bgs) Ran 2.7' Rec 2.7' Loss 0.0' UL 0.0' HP 600 psi WP 200 psi Time 8 min RQD 100%
	99								
	100								Bottom of borehole at 100.2