APPENDIX B

BORING LOGS AND WELL CONSTRUCTION LOGS

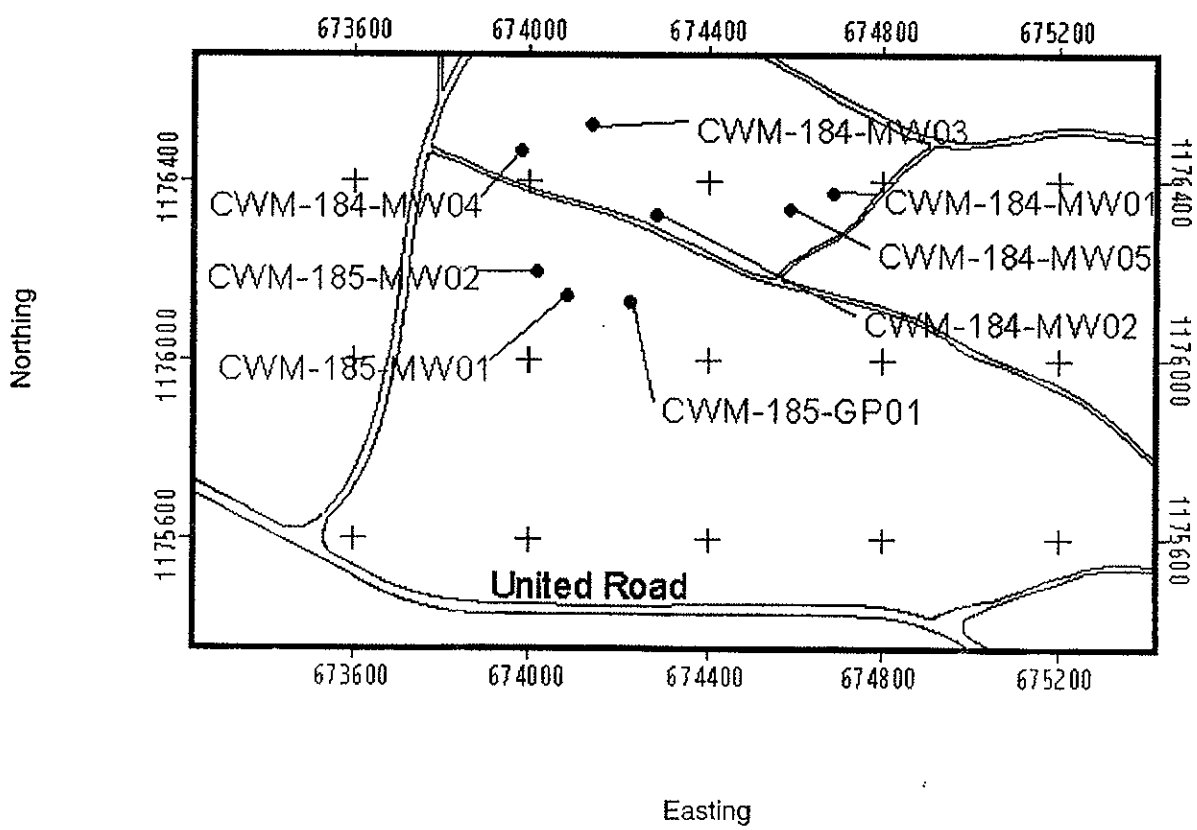
BORING LOGS

HTRW DRILLING LOG	District: Mobile USACE	HOLE NUMBER CWM-184-MW01
1. Company name: Shaw Environmental, Inc.	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/Glen Bilbrey	6. Mfr. designation of drill: Geoprobe/CME-550X
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 4'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-31, Parcel 184(7) 9. Surface elevation (feet above mean sea level): 840.59 10. Date started: 10/16/01 — 11. Date completed: 10/25/01
12. Overburden thickness (feet bgs): >47	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): 32.1 on 10/23/01
14. Total depth of hole (feet bgs): 47	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2" Permanent	NA	Cindy Levaas/Adam Day		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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)
840	0	sw: Brown to yellowish orange, slightly moist, unconsolidated SAND, little coarse quartz-rich subangular Gravel.	sw		Organic Vapor = 0.0ppm		TL0001		Rec 3.0'/4.0' (0-4' bgs) Geoprobe - ESN - 10/16/01
	1								
	2								
	3								
	4	cl: Brown to yellowish orange, slightly moist, stiff CLAY, trace fine to coarse Sand, little coarse quartz-rich subangular Gravel.	cl		Organic Vapor = 0.0ppm		TL0002		Rec 1.0'/1.0' (4-5' bgs)
835	5	cl: Light brown to yellowish orange, hard, dry CLAY, some medium grained Sand, little white to yellowish brown sandstone Gravel, little Silt.	cl		Organic Vapor = 5.1ppm			25 28 28 22	Direct push refusal at 5' bgs Rec 2.0'/2.0'1 (5-7' bgs) HSA - Miller Drilling Company - 10/22/01
	6								
	7	gp: White to yellowish brown, fine to medium grained, dry, angular sandstone GRAVEL, some fine to medium, white to yellowish brown to reddish brown, dry, subangular Sand, little Silt, trace Clay.	gp		Organic Vapor = 5.2ppm			5 54 78 53	Rec 1.9'/2.0' (7-8.9' bgs)
	8								
	9	NA: No recovery.	NA						
		sc: Yellowish orange to red to light brown to white, dry, dense SAND, some dry, stiff CLAY, little white angular sandstone Gravel.			Organic Vapor = 4.5ppm			25 20 22 21	Rec 2.0'/2.0' (9-11' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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)
830			sc						
	11	cl: Yellowish orange to red to brown, very stiff, moist CLAY, some Sand, little Silt.			Organic Vapor = 0.0ppm			3 7 10 11	Rec 2.0'/2.0' (11-13' bgs)
	12		cl						
	13	NA: No sample collected for lithologic description.							
	14		NA						
	15	sc: Reddish brown to white to light brown, moist, dense SAND, some yellowish white angular sandstone Gravel, some reddish brown stiff CLAY, little Silt.	sc		Organic Vapor = 0.0ppm			15 12 25 29	Rec 0.6'/2.0' (15-17' bgs)
825		NA: No recovery.							
	16		NA						
	17	NA: No sample collected for lithologic description.							
	18		NA						
	19								
	20	sc: Reddish brown to white to light brown.			Organic			14 13	Rec 2.0'/2.0' (20-22' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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)
820	21	moist, dense SAND, some yellowish white angular sandstone Gravel, some reddish brown stiff CLAY, little Silt.	sc		Vapor = 0.0ppm			12 13	
	22	NA: No sample collected for lithologic description.	NA						
	23								
	24								
	25	cl: Light brown to yellowish orange, stiff, moist CLAY, some Sand, trace Silt.	cl		Organic Vapor = 0.0ppm			4 7 5 6	Rec 2.0'/2.0' (25-27' bgs)
815	26								
	27	NA: No sample collected for lithologic description.	NA						
	28								
	29								
	30	cl: Yellowish orange to light brown, moist, very stiff CLAY, little coarse grained, white			Organic Vapor			4 7 8 9	Rec 2.0'/2.0' (30-32' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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)
810		subrounded Sand, trace Silt.			= 0.0ppm				
	31		cl						
	32	NA: No sample collected for lithologic description.							
	33		NA						
	34								
	35	cl: Very soft, light brown, wet CLAY, trace Sand, trace Silt.	cl		Organic Vapor = 0.0ppm			0 0 0 2	Groundwater encountered at 35' bgs Rec 0.7'/2.0' (35-37' bgs)
805		NA: No recovery.							
	36		NA						
	37	NA: No sample collected for lithologic description.							
	38		NA						
	39								
	40	cl: Very soft, light brown, wet CLAY, trace Sand, trace Silt.			Organic Vapor =			0 0 4 4	Rec 1.2'/2.0' (40-42' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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)
800			cl		0.0ppm				
	41								41
		NA: No recovery.	NA						
	42	NA: No sample collected for lithologic description.							42
	43								43
			NA						
	44								44
	45	cl: Very soft, light brown, wet CLAY, trace Sand, trace Silt.	cl		Organic Vapor = 0.0ppm			0 0 2 2	Rec 0.6'/2.0' (45-47' bgs) 45
795		NA: No recovery.							
	46		NA						46
	47								Bottom of borehole at 47' bgs 47

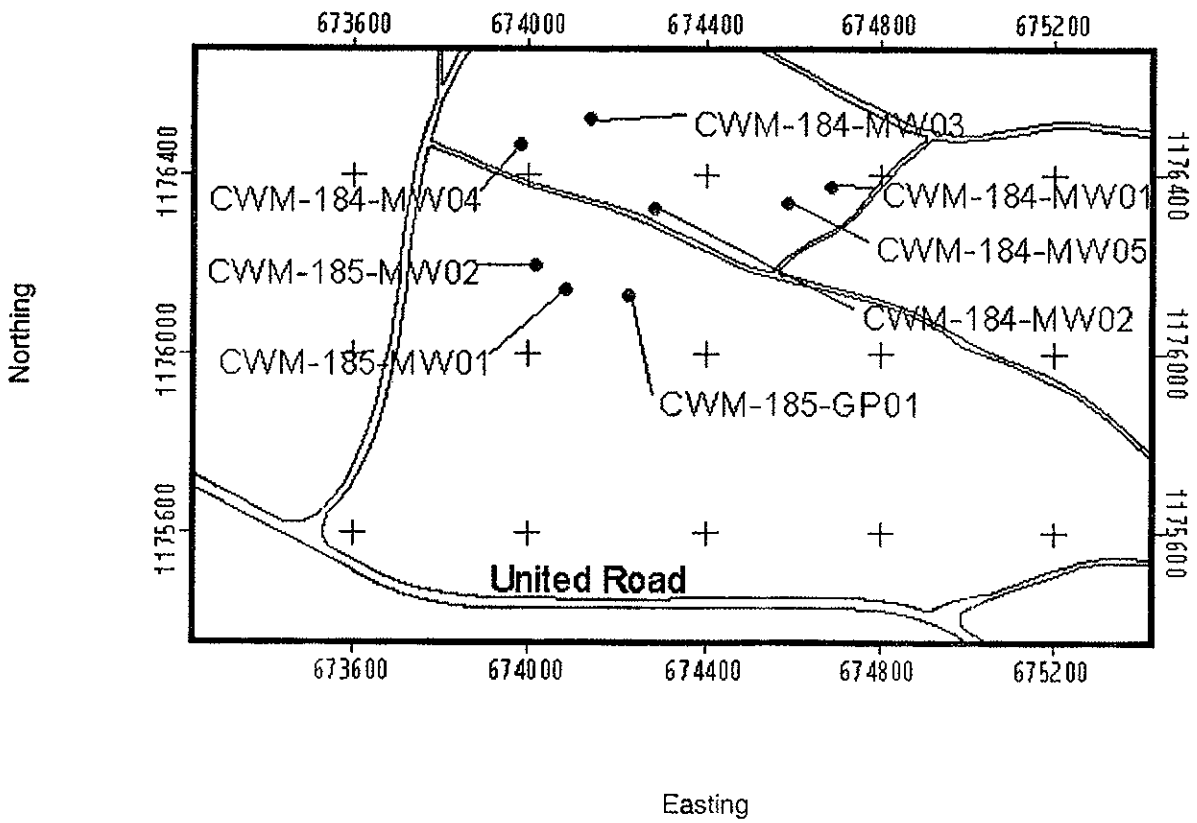
HTRW DRILLING LOG

District: Mobile USACE		HOLE NUMBER CWM-184-MW02
1. Company name: Shaw Environmental, Inc.	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 5 sheets

3. Project: Fort McClellan	4. Location: Calhoun County, Alabama
5. Name of driller: Sammy McDaniel/Glen Bilbrey	6. Mfr. designation of drill: Geoprobe/CME-550X
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 4'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-31, Parcel 184(7) 9. Surface elevation (feet above mean sea level): 827.08 10. Date started: 10/16/01 — 11. Date completed: 10/25/01
12. Overburden thickness (feet bgs): >32	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): 6.7 after 21 hours
14. Total depth of hole (feet bgs): 32	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2" Permanent	NA	Cindy Levaas/Adam Day		

LOCATION SKETCH/COMMENTS:



bgs= below ground surface
NA = Not applicable

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW02

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 2 of 5 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	cl: Yellowish orange, slightly moist, soft to medium stiff CLAY, little fine to coarse Sand.			Organic Vapor = 0.0ppm		TL0003		Rec 4.0'/4.0' (0-4' bgs) Geoprobe - ESN - 10/16/01
	1								
825	2		cl						
	3								
	4	cl: Yellowish orange, slightly moist, medium stiff CLAY, some fine to coarse Sand.			Organic Vapor = 0.0ppm				Rec 2.0'/2.0' (4-6' bgs)
	5		cl				TL0004		
	6	NA: No sample collected for lithologic descriptions.							Direct push refusal at 6' bgs HSA - Miller Drilling Company - 10/23/01
820	7		NA						
	8	sp: Yellowish orange to light brown to red to black, fine to medium grained, poorly sorted, moist SAND, some fine to medium grained subangular sandstone Gravel, little Clay, little Silt.			Organic Vapor = 0.0ppm			3 4 4 12	Rec 2.0'/2.0' (8-10' bgs)
	9		sp						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW02

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 3 of 5 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: Yellowish orange to light brown to reddish brown to black to white mottled, very stiff, moist CLAY, some poorly sorted, fine to medium grained, light brown Sand, little Silt, trace light brown, subangular, fine to medium grained sandstone Gravel.	cl		Organic Vapor = 0.0ppm			10 10 14 14	Rec 2.0'/2.0' (10-12' bgs)
815	12	NA: No sample collected for lithologic descriptions.	NA						
	13								
	14								
	15	cl: Light brown to black to reddish brown mottled, stiff, moist CLAY, little poorly sorted, coarse, light brown Sand.	cl		Organic Vapor = 0.0ppm			2 3 8 5	Rec 2.0'/2.0' (15-17' bgs)
	16								
810	17	NA: No sample collected for lithologic descriptions.	NA						
	18								
	19								
	20	cl: Light brown to black to reddish brown			Organic			1 2 3 4	Rec 2.0'/2.0' (20-22' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW02

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 4 of 5 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)
		mottled, stiff, moist CLAY, little poorly sorted, coarse, light brown Sand.			Vapor = 0.0ppm				
	21		cl						21
805	22	NA: No sample collected for lithologic descriptions.							22
	23		NA						23
	24								24
									Groundwater encountered at 25' bgs
	25	ch: Light brown to black, soft, wet CLAY, little poorly sorted, coarse, light brown Sand.			Organic Vapor = 0.0ppm			1 2 2 3	Rec 2.0'/2.0' (25-27' bgs) 25
	26		ch						26
800	27	NA: No sample collected for lithologic descriptions.							27
	28		NA						28
	29								29
	30	ch: Light brown to black, soft, wet CLAY, little poorly sorted, coarse, light brown Sand.			Organic Vapor			0 0 0 1	Rec 2.0'/2.0' (30-32' bgs) 30

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW02

Project: Fort McClellan

Geologist: Cindy Levaas/Adam Day

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		ch		0.0ppm				31
	32								Bottom of borehole at 32' bgs 32

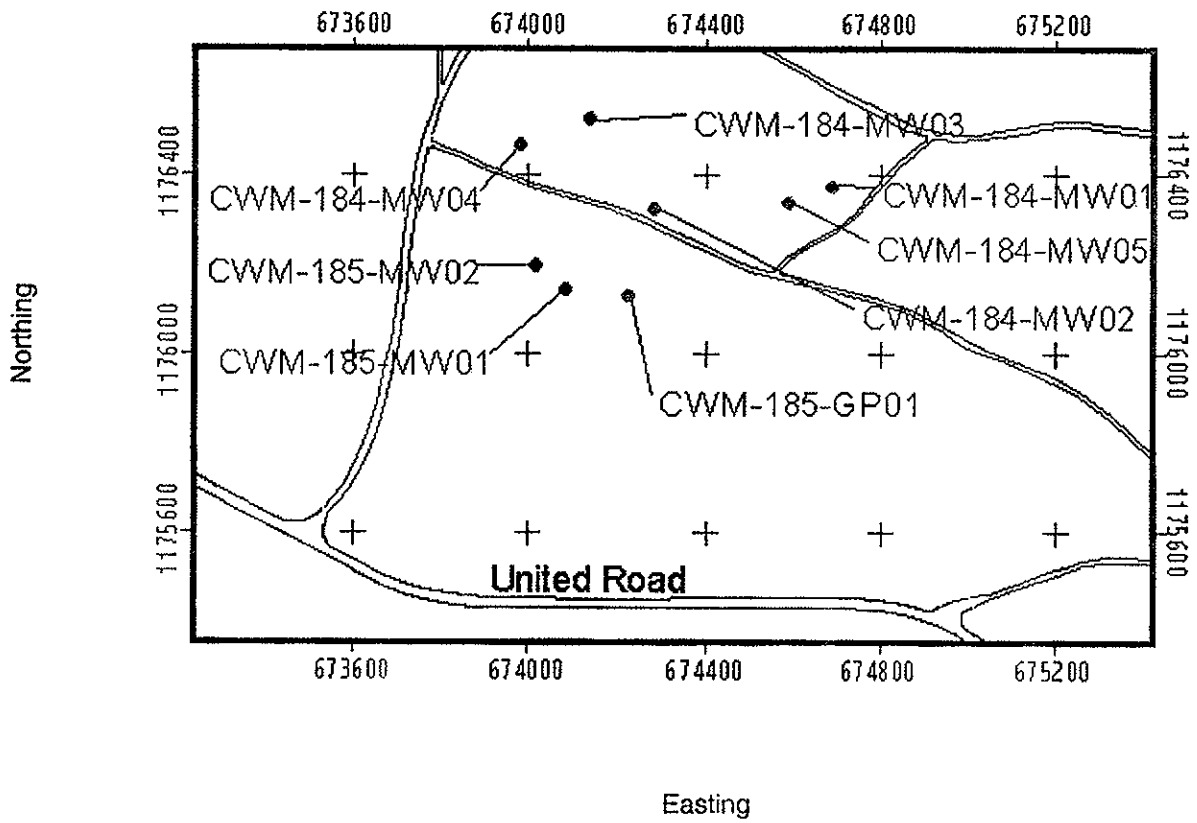
HTRW DRILLING LOG

District: Mobile USACE		HOLE NUMBER CWM-184-MW03
1. Company name: Shaw Environmental, Inc.	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 5 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel/Glen Bilbrey	6. Mfr. designation of drill: Geoprobe/CME-550X
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 4'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-31, Parcel 184(7) 9. Surface elevation (feet above mean sea level): 828.35 10. Date started: 10/16/01 — 11. Date completed: 10/25/01
12. Overburden thickness (feet bgs): >37	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): 12.8 after 21 hours
14. Total depth of hole (feet bgs): 37	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2" Permanent	NA	Cindy Levaas/Adam Day		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW03

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 2 of 5 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)
825	0–4	cl: Brown to orange, slightly moist, stiff CLAY, little coarse to fine Sand.	cl		Organic Vapor = 0.0ppm		TL0005		Rec 3.0'/4.0' (0-4' bgs) Geoprobe - ESN - 10/16/01
	4–5	cl: Brown to orange, slightly moist, stiff CLAY, little fine to coarse Sand.	cl		Organic Vapor = 0.0ppm		TL0006		Rec 1.0'/1.0' (4-5' bgs)
	5–6	cl: Yellowish orange to light brown to light gray, very stiff, dry CLAY, some coarse quartz Sand, little Silt. White to light brown hard, subangular, medium grained quartzite Gravel in shoe.	cl		Organic Vapor = 0.0ppm			6 13 10 32	Direct push refusal at 5' bgs. Rec 1.7'/2.0' (5-7' bgs) HSA - Miller Drilling Company - 10/24/01
	6–7	NA: No recovery.	NA						
	7–8	cl: Light brown to yellowish orange, very stiff, dry CLAY, some coarse quartz Sand, little Silt.	cl		Organic Vapor = 0.0ppm			56 40 50 68	Rec 1.9'/2.0' (7-9' bgs)
820	8–9	gp: Pink to white to red to yellowish orange, dry, coarse grained, angular GRAVEL, some pink to white to red to yellowish orange, dry, medium grained, poorly sorted Sand, little Silt.	gp						
	9–10	NA: No recovery.	NA						
		gp: Pink to white to red to yellowish orange, dry, coarse grained, angular GRAVEL, some pink to white to red to yellowish orange, dry, medium grained, poorly sorted Sand, little Silt.	gp		Organic Vapor = 0.0ppm			105/0.4'	Rec 0.4'/0.4' (9-9.4' bgs)
	10	NA: No sample collected for lithologic							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW03

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 3 of 5 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.	NA						
	11	sc: Light brown to yellowish orange to reddish brown to black to orange, medium dense, moist, medium grained SAND, some Clay, little Silt, little pink to light brown, medium to fine grained, subangular quartzite Gravel.	sc		Organic Vapor = 0.0ppm			2 13 15 14	Rec 2.0'/2.0' (11-13' bgs)
	12								
	13	NA: No sample collected for lithologic description.	NA						
815									
	14								
	15	cl: Light brown to yellowish orange to yellowish white to black mottled, moist, stiff CLAY, little medium grained, subrounded, white to gray, poorly sorted Sand, trace Silt.	cl		Organic Vapor = 0.0ppm			3 4 4 5	Rec 2.0'/2.0' (15-17' bgs)
	16								
	17	NA: No sample collected for lithologic description.	NA						
	18								
810									
	19								
	20	cl: Light brown to yellowish orange to yellowish			Organic			2 3 4 4	Rec 2.0'/2.0' (20-22' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW03

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 4 of 5 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)
		white to black mottled, moist, stiff CLAY, little medium grained, subrounded, white to gray, poorly sorted Sand, trace Silt.			Vapor = 0.0ppm				
	21		cl						21
	22	NA: No sample collected for lithologic description.							22
	23								23
805			NA						
	24								24
									Groundwater encountered at 25' bgs
	25	cl: Light brown to yellowish orange to yellowish white to black to reddish brown mottled, wet, medium stiff CLAY, little subrounded, white to gray, medium grained, poorly sorted Sand, little Silt, trace medium grained, yellowish brown, subrounded sandstone Gravel. One piece of Gravel had a black rind and yellowish white core.			Organic Vapor = 0.0ppm			2 2 2 3	Rec 2.0'/2.0' (25-27' bgs) 25
	26		cl						26
	27	NA: No sample collected for lithologic description.							27
	28								28
800			NA						
	29								29
	30	cl: Light brown to yellowish orange to yellowish white to black to reddish brown mottled, wet			Organic Vapor			0 0 0 2	Rec 0.9'/2.0' (30-32' bgs) 30

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW03

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 5 of 5 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)
		medium stiff CLAY, little subrounded, white to gray, medium grained, poorly sorted Sand, little Silt, trace medium grained, yellowish brown, subrounded sandstone Gravel.	cl		= 0.0ppm				
	31	NA: No recovery.	NA						
	32	NA: No sample collected for lithologic description.	NA						
795	33								
	34								
	35	cl: Light brown to yellowish orange to yellowish white to black to reddish brown mottled, wet, medium stiff CLAY, little subrounded, white to gray, medium grained, poorly sorted Sand, little Silt, trace medium grained, yellowish brown, subrounded sandstone Gravel.	cl		Organic Vapor = 0.0ppm			0 0 0 1	Rec 2.0'/2.0' (35-37' bgs)
	36								
	37								Bottom of borehole at 37' bgs

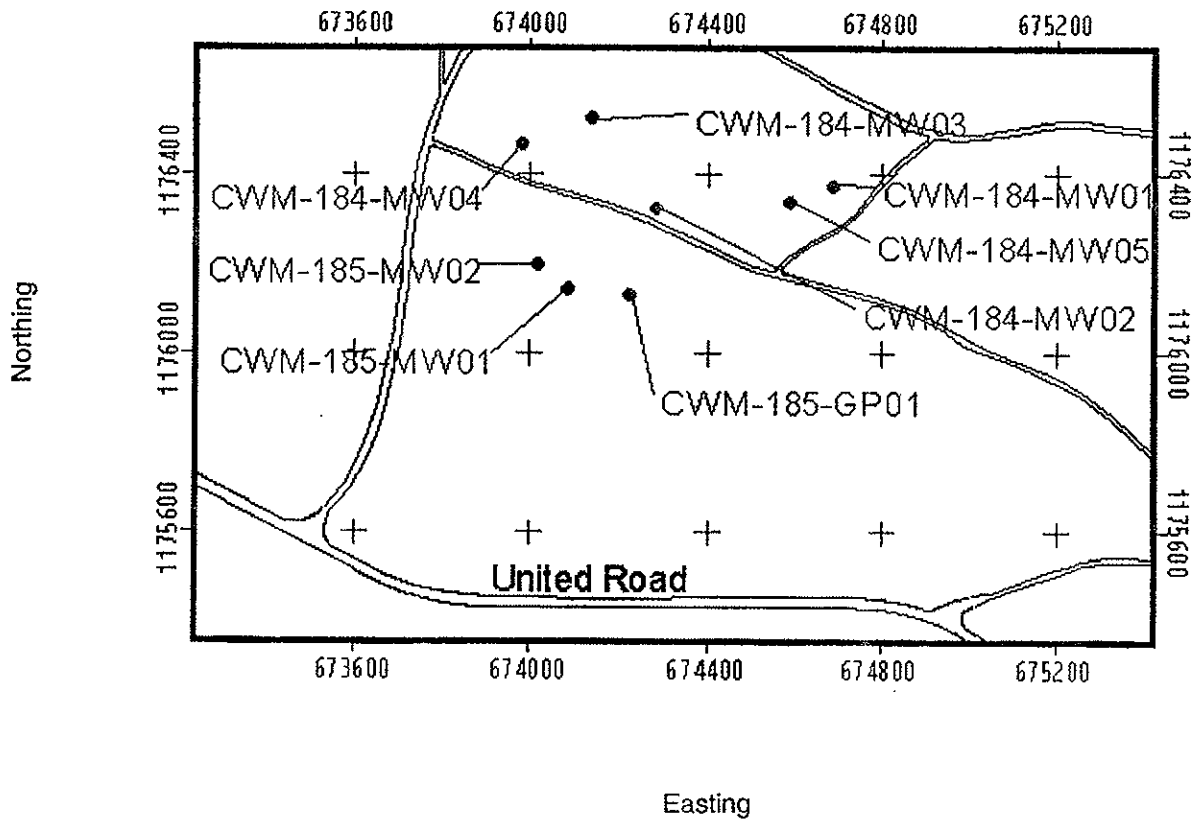
HTRW DRILLING LOG

District: **Mobile USACE**		**HOLE NUMBER** CWM-184-MW04
1. Company name: **Shaw Environmental, Inc.**	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 4 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel/Glen Bilbrey	6. Mfr. designation of drill: Geoprobe/CME-550X
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 4'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-31, Parcel 184(7) 9. Surface elevation (feet above mean sea level): 821.95 10. Date started: 10/16/01 — 11. Date completed: 10/29/01
12. Overburden thickness (feet bgs): >22	15. Depth groundwater encountered (feet bgs): 13
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 5.9 after 21 hours
14. Total depth of hole (feet bgs): 22	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2" Permanent	NA	Cindy Levaas/Adam Day		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW04

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 2 of 4 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	sc: Light brown to yellowish orange, slightly moist, medium stiff to stiff SAND, some Clay.	sc		Organic Vapor = 0.0ppm		TL0007 TL0008		Rec 3.3'/3.3' (0-3.3' bgs) Geoprobe - ESN - 10/16/01
	1								
820	2								
	3								Direct push refusal at 3.3' bgs
		cl: Brown to light brown to yellowish orange to reddish brown, moist, very stiff CLAY, some medium grained, subrounded, dense Sand, little Silt.	cl		Organic Vapor = 0.0ppm			16 27 30 34	Rec 0.8'/2.0' (3-5' bgs) HSA - Miller Drilling Company - 10/24/01
	4	gp: Pink to yellowish orange to light brown, fine grained, angular quartzite GRAVEL, some medium to fine grained, pink to orange, coarse Sand.	gp						
		NA: No recovery.	NA						
	5	cl: Light brown to yellowish orange to red, very stiff, moist CLAY, some fine grained Sand, little Silt, little yellow to red, highly weathered, stained, fine grained, subangular quartzite Gravel.	cl		Organic Vapor = 0.0ppm			50 24 26 28	Rec 1.4'/2.0' (5-7' bgs)
	6								
		NA: No recovery.	NA						
815	7	cl: Light brown to yellowish orange to reddish brown to black mottled, very stiff, moist CLAY, some yellowish orange, fine to medium grained, poorly sorted Sand, little light brown, fine grained, subangular quartzite Gravel.	cl		Organic Vapor = 0.0ppm			40 33 52 50	Rec 2.0'/2.0' (7-9' bgs)
	8								
	9	cl: Light brown to yellowish orange to black to reddish brown, moist, medium stiff CLAY, little white to black, medium grained Sand, little Silt.			Organic Vapor = 0.0ppm			1 2 2 4	Rec 2.0'/2.0' (9-11' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW04

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 3 of 4 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	ch: Light brown to yellowish white to black moist to wet, medium stiff CLAY, little white to black to gray, medium grained Sand, little Silt.	cl ch		Organic Vapor = 0.0ppm			2 2 3 4	Rec 2.0'/2.0' (11-13' bgs)
810	12								
	13	NA: No sample collected for lithologic description.							Groundwater encountered at 13' bgs
	14		NA						
	15	cl: Yellowish orange to light brown, wet, soft CLAY, some medium grained Sand. NA: No recovery.	cl		Organic Vapor = 0.0ppm			0 0 2 2	Rec 0.1'/2.0' (15-17' bgs)
	16		NA						
805	17	NA: No sample collected for lithologic description.							
	18		NA						
	19								
	20	cl: Yellowish orange to light brown, wet, soft			Organic			0 0 1 1	Rec 2.0'/2.0' (20-22' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW04

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 4 of 4 sheets

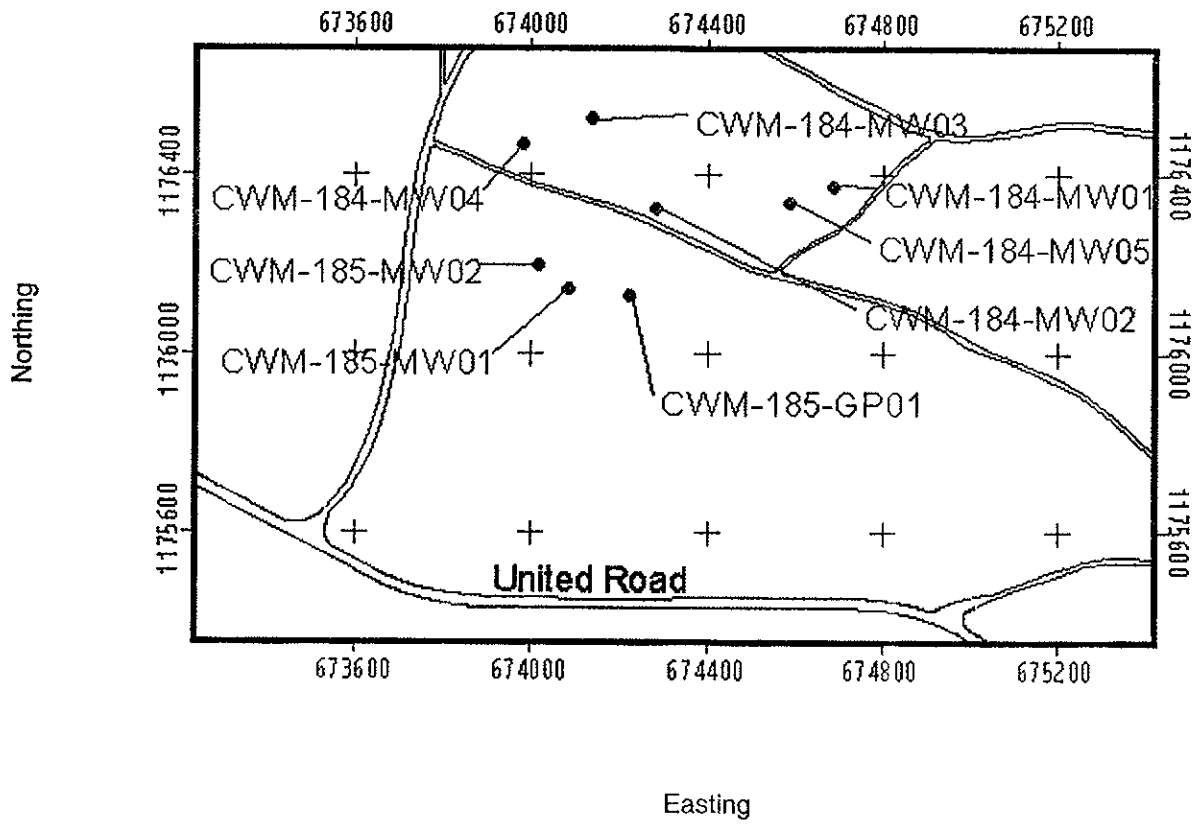
Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21	CLAY, some medium grained Sand. (Small piece of metal (iron) at ~20' bgs, caused high hits on PID, the rest of sample read ~4.0 ppm).	cl		Vapor = 13.2ppm				21
800	22								Bottom of borehole at 22' bgs 22

HTRW DRILLING LOG	District: Mobile USACE	HOLE NUMBER CWM-184-MW05
1. Company name: Shaw Environmental, Inc.	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/Glen Bilbrey	6. Mfr. designation of drill: Geoprobe/CME-550X
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 4'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-31, Parcel 184(7) 9. Surface elevation (feet above mean sea level): 837.39 10. Date started: 10/16/01 — 11. Date completed: 10/25/01
12. Overburden thickness (feet bgs): >50	15. Depth groundwater encountered (feet bgs): 45
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 20.3 after 20 hours
14. Total depth of hole (feet bgs): 50	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2" Permanent	NA	Cindy Levaas/Adam Day		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW05

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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	sc: Light brown to yellowish orange, moist, fine to coarse SAND, some Clay, little subangular, coarse, quartz-rich Gravel.					TL0009		Rec 3.8'/4.0' (0-4' bgs) Geoprobe - ESN - 10/16/01
	1								
	2		sc						
835									
	3								
	4	sc: Yellowish orange, moist, fine to coarse SAND, some Clay, little subangular, coarse, quartz-rich Gravel.							Rec 4.0'/4.0' (4-8' bgs)
	5								
	6		sc						
	7								
830							TL0010		
	8	sp: Yellowish orange to light brown to pink to white to reddish brown, dense, fine to medium, poorly sorted, moist SAND, some white to yellowish brown, fine to medium grained sandstone Gravel, little Silt, little Clay.			Organic Vapor = 1.8ppm			13 20 18 26	Direct push refusal at 8' bgs Rec 2.0'/2.0' (8-10' bgs) HSA - Miller Drilling Company - 10/23/01
	9		sp						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW05

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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	sp: Yellowish orange to light brown to pink to white to reddish brown, dense, fine to medium, poorly sorted, moist SAND, some white to yellowish brown, fine to medium grained sandstone Gravel, little Silt, little Clay.	sp		Organic Vapor = 1.6ppm			0 8 19 17	Rec 1.6'/2.0' (10-12' bgs)
		NA: No recovery.	NA						
	12	NA: No sample collected for lithologic description.	NA						
825									
	13	sp: Yellowish orange to light brown to pink to white to reddish brown, dense, fine to medium, poorly sorted, moist SAND, some white to yellowish brown, fine to medium grained sandstone Gravel, little Silt, little Clay.	sp		Organic Vapor = 2.4ppm			18 19 17 11	Rec 2.0'/2.0' (13-15' bgs)
	14								
	15	NA: No sample collected for lithologic description.	NA						
	16								
	17								
820									
	18	cl: Light brown to yellowish orange, moist, very stiff CLAY, some fine to medium, poorly sorted Sand, little Silt, little yellowish brown, sandstone Gravel.	cl		Organic Vapor = 0.5ppm			6 10 7 10	Rec 1.2'/2.0' (18-20' bgs)
	19	NA: No recovery.	NA						
	20	NA: No sample collected for lithologic							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW05

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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								
			NA						
	22								
815									
	23	cl: Light brown to yellowish orange, moist, very stiff CLAY, some fine to medium, poorly sorted Sand, little Silt, little yellowish brown, sandstone Gravel.			Organic Vapor = 0.0ppm			4 7 8 11	Rec 2.0'/2.0' (23-25' bgs)
	24		cl						
	25	NA: No sample collected for lithologic description.							
	26								
			NA						
	27								
810									
	28	cl: Light brown to yellowish orange, moist, very stiff CLAY, some fine to medium, poorly sorted Sand, little Silt, little yellowish brown, sandstone Gravel.			Organic Vapor = 1.3ppm			4 6 7 9	Rec 2.0'/2.0' (28-30' bgs)
	29		cl						
	30	NA: No sample collected for lithologic description.							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW05

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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						
	32								
805									
	33	cl: Light brown to yellowish orange, moist, very stiff CLAY, some fine to medium, poorly sorted Sand, little Silt, little yellowish brown, sandstone Gravel.	cl		Organic Vapor = 0.0ppm			2 3 4 6	Rec 2.0'/2.0' (33-35' bgs)
	34								
	35	NA: No sample collected for lithologic description.	NA						
	36								
	37								
800									
	38	cl: Light brown, moist, stiff CLAY, little Sand.	cl		Organic Vapor = 0.0ppm			3 3 6 8	Rec 2.0'/2.0' (38-40' bgs)
	39								
	40	NA: No sample collected for lithologic description.							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-184-MW05

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | 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								
			NA						
	42								
795									
	43	cl: Light brown, moist, medium stiff CLAY, little Sand.			Organic Vapor = 0.0ppm			2 3 4 5	Rec 2.0'/2.0' (43-45' bgs)
	44		cl						
	45	NA: No sample collected for lithologic description.							Groundwater encountered at 45' bgs
	46								
			NA						
	47								
790									
	48	sc: Light brown, wet, loose SAND, some sandstone Gravel, some Clay.			Organic Vapor = 0.0ppm			6 18 3 0	Rec 1.6'/2.0' (48-50' bgs)
	49		sc						
		NA: No recovery.	NA						Bottom of borehole at 50' bgs
	50								

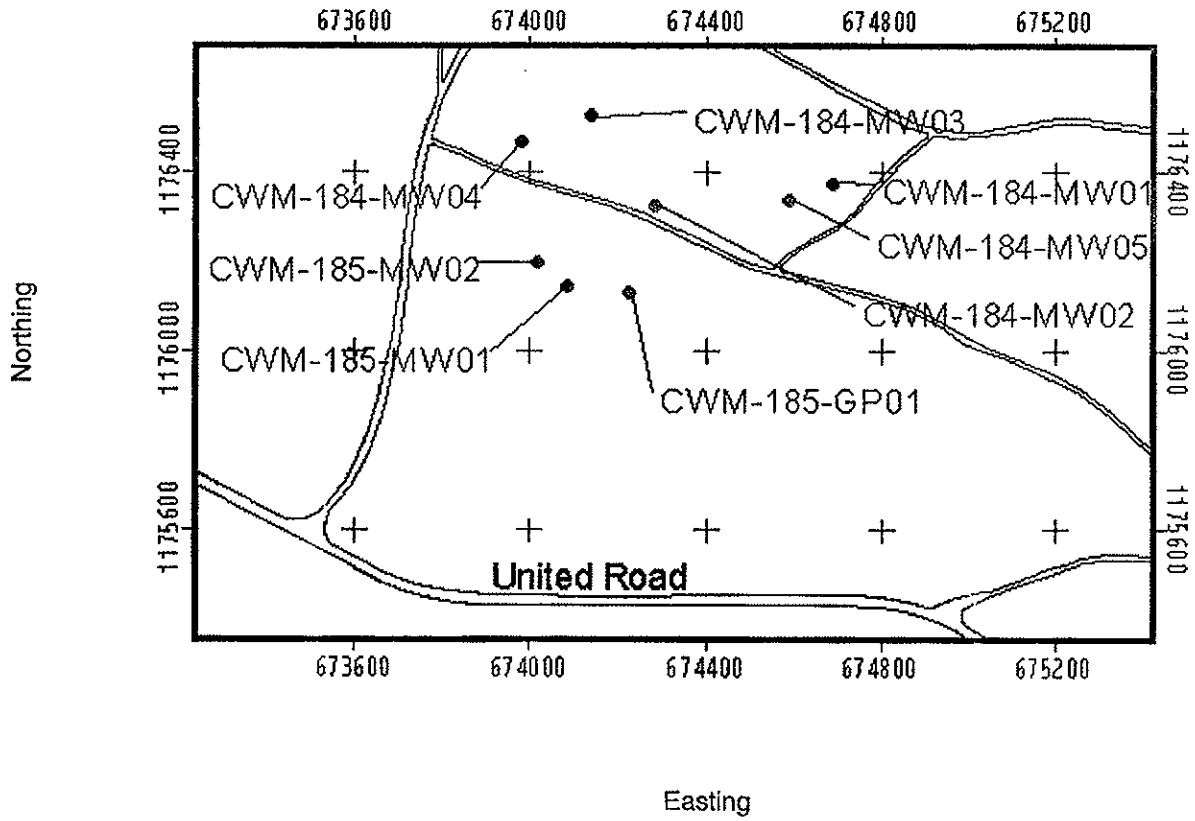
HTRW DRILLING LOG

District: Mobile USACE		HOLE NUMBER CWM-185-GP01
1. Company name: Shaw Environmental, Inc.	2. Drill Subcontractor: ESN	Sheet 1 of 2 sheets

3. Project: Fort McClellan	4. Location: Calhoun County, Alabama
5. Name of driller: Sammy McDaniel	6. Mfr. designation of drill: Geoprobe
7. Sizes and types of drilling and sampling equipment: Direct Push DP - 4'x2" Acetate-Lined Sampler	8. Hole location: Training Area T-31, Parcel 185(7) 9. Surface elevation (feet above mean sea level): 1039.59 10. Date started: 10/16/01 — 11. Date completed: 10/16/01
12. Overburden thickness (feet bgs): >9	15. Depth groundwater encountered (feet bgs): 8.1
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): NA
14. Total depth of hole (feet bgs): 9	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	Bentonite	NA	NA	Cindy Levaas		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-185-GP01

Project: Fort McClellan | Geologist: Cindy Levaas | Sheet 2 of 2 sheets

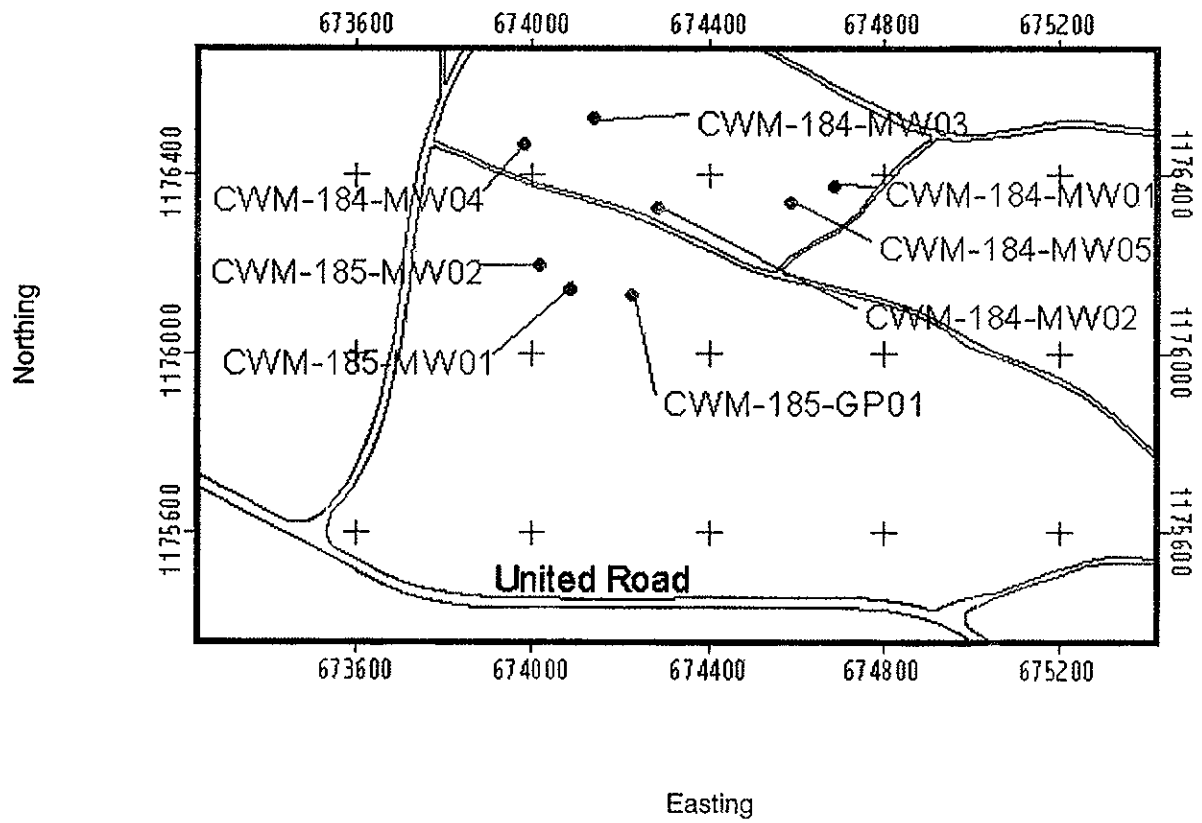
Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	sc: Brown to yellowish orange, slightly moist, fine to coarse SAND, some Clay.	sc		Organic Vapor = 0.0ppm		TF0007		Rec 3.0'/4.0' (0-4' bgs) Geoprobe - ESN - 10/16/01
	1								
	2								
	3								
	4	sc: Yellowish orange, slightly moist, medium stiff CLAY and SAND.			Organic Vapor = 0.0ppm				Rec 3.5'/4.0' (4-8' bgs)
1035									
	5								
	6		sc						
	7								
							TF0008		
	8	NA: No recovery.	NA						Rec 0.0/1.0' (8-9' bgs) Groundwater encountered at 8.1' bgs
	9								Direct push refusal at 9' bgs Bottom of borehole at 9' bgs

HTRW DRILLING LOG	District: Mobile USACE	HOLE NUMBER CWM-185-MW01
1. Company name: Shaw Environmental, Inc.	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 4 sheets

3. Project: Fort McClellan	4. Location: Calhoun County, Alabama
5. Name of driller: Sammy McDaniel/Glen Bilbrey	6. Mfr. designation of drill: Geoprobe/CME-550X
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 4'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-31, Parcel 185(7) 9. Surface elevation (feet above mean sea level): 820.26 10. Date started: 10/16/01 — 11. Date completed: 10/29/01
12. Overburden thickness (feet bgs): >27	15. Depth groundwater encountered (feet bgs): 15
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 5.3 after 20 hours
14. Total depth of hole (feet bgs): 27	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2" Permanent	NA	Cindy Levaas/Adam Day		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-185-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 2 of 4 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)
820	0	sc: Olive-gray to light gray, slightly moist, fine to coarse SAND, some Clay.	sc		Organic Vapor = 0.0ppm		TF0001		Rec 4.0'/4.0' (0-4' bgs) Geoprobe - ESN - 10/16/01
	1								
	2								
	3								
	4	sc: Light gray to yellowish orange, moist, fine to coarse SAND and CLAY, little coarse quartz-rich subangular Gravel.	sc		Organic Vapor = 0.0ppm		TF0002		Rec 1.0'/1.0' (4-5' bgs)
	5								Direct push refusal at 5' bgs
815		sc: Light brown to yellowish orange to reddish brown to gray to yellowish white, fine to medium grained SAND, some yellowish orange to gray to brown, stiff, moist Clay, little light brown to yellowish orange, fine grained, angular quartzite Gravel, little Silt.	sc		Organic Vapor > 2000 ppm			13 30 35 13	Rec 1.7'/2.0' (5-7' bgs) HSA - Miller Drilling Company - 10/25/01
	6								
		NA: No recovery.	NA						
	7	cl: Light brown to yellowish orange, stiff, moist CLAY, some medium grained, yellowish orange Sand, little yellowish orange to white, subangular quartzite Gravel.	cl		Organic Vapor > 100 ppm			7 8 10 22	Rec 1.0'/2.0' (7-9' bgs)
	8	NA: No recovery.	NA						
	9	cl: Light brown to yellowish orange, stiff, moist CLAY, some medium grained, yellowish orange Sand, little yellowish orange to white, subangular quartzite Gravel.			Organic Vapor > 1000 ppm			20 25 13 10	Rec 2.0'/2.0' (9-11' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-185-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 3 of 4 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)
810			cl						
	11	cl: Light brown to yellowish orange to black mottled, moist, stiff CLAY, little yellowish orange to light brown to white, medium grained Sand, trace Silt, trace white, coarse grained, subangular, sandstone Gravel.			Organic Vapor > 100ppm			6 10 9 10	Rec 2.0'/2.0' (11-13' bgs)
	12		cl						
	13	NA: No sample collected for lithologic description.							
	14		NA						
									Groundwater encountered at ~15' bgs
	15	cl: Light brown to black mottled, soft, very wet CLAY, some yellowish white, medium grained Sand, little Silt.			Organic Vapor > 100ppm			1 1 2 2	Rec 0.5'/2.0' (15-17' bgs)
805			cl						
		NA: No recovery.							
	16		NA						
	17	NA: No sample collected for lithologic description.							
	18		NA						
	19								
	20	cl: Light brown to black mottled, soft, very wet			Organic			0 1 8 7	Rec 1.7'/2.0' (20-21.7' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-185-MW01

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 4 of 4 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)
800		CLAY, some yellowish white, medium grained Sand, little Silt.	cl		Vapor > 10.0ppm				
	21								21
		dol: White to gray, fine grained, wet, highly weathered, severely fractured DOLOMITE, bedded at ~45 degrees.	dol						
	22	NA: No recovery.	NA						22
		NA: No sample collected for lithologic description.							
	23								23
			NA						
	24								24
	25	dol: White to gray, fine grained, wet, highly weathered, severely fractured DOLOMITE, bedded at ~45 degrees.	dol		Organic Vapor > 10.0ppm			0 1 1 3	Rec 0.1'/2.0' (25-27' bgs) 25
795		NA: No recovery.							
	26		NA						26
	27								Bottom of borehole at 27' bgs 27

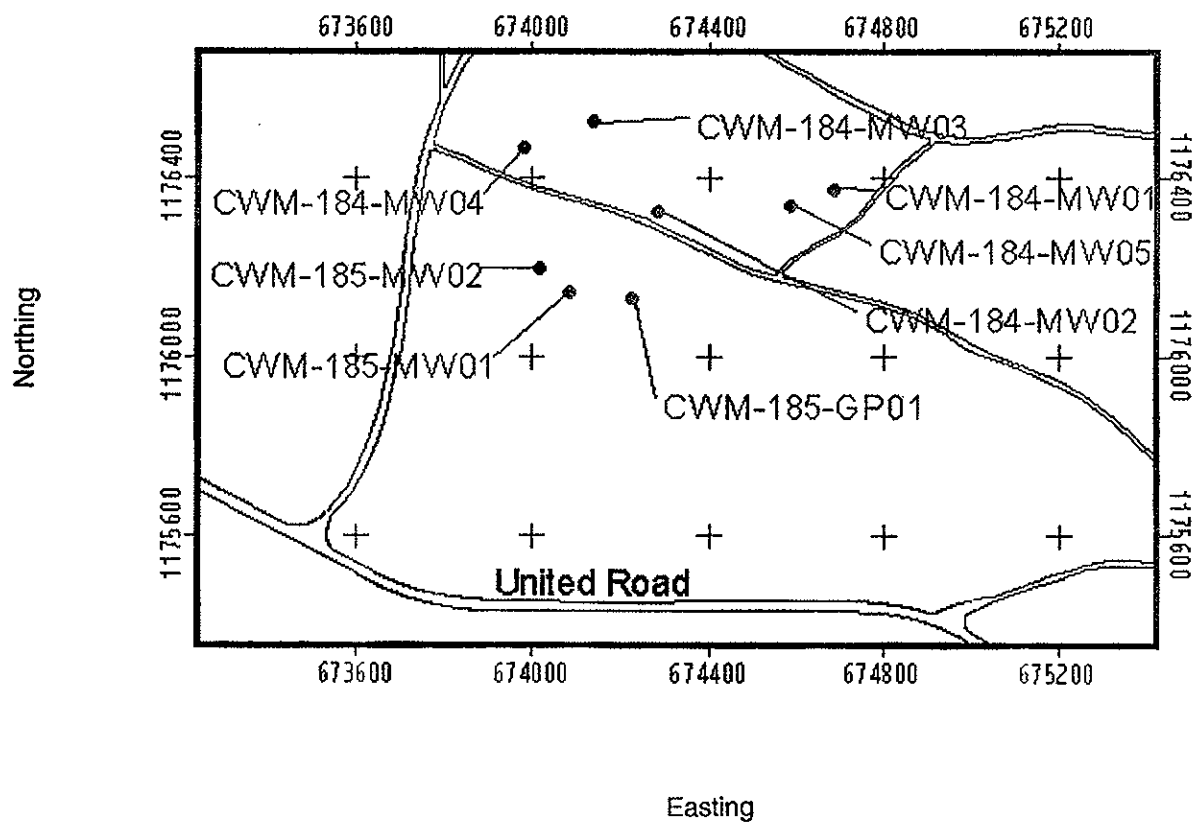
HTRW DRILLING LOG

District: **Mobile USACE**		**HOLE NUMBER** CWM-185-MW02
1. Company name: **Shaw Environmental, Inc.**	2. Drill Subcontractor: ESN/Miller Drilling Company	Sheet 1 of 3 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Sammy McDaniel/Glen Bilbrey	6. Mfr. designation of drill: Geoprobe/CME-550X
7. Sizes and types of drilling and sampling equipment: Direct Push, Hollow Stem Auger DP - 4'x2" Acetate-Lined Sampler HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons	8. Hole location: Training Area T-31, Parcel 185(7) 9. Surface elevation (feet above mean sea level): 814.19 10. Date started: 10/16/01 — 11. Date completed: 10/29/01
12. Overburden thickness (feet bgs): >20	15. Depth groundwater encountered (feet bgs): 4
13. Depth drilled into rock (feet bgs): 0	16. Depth to water and elapsed time after drilling completed (feet bgs): 4.6 after 20 hours
14. Total depth of hole (feet bgs): 20	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: NA		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	Yes	Yes	CWM Breakdown	Orthosulfur	SVOCs	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2" Permanent	NA	Cindy Levaas/Adam Day		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-185-MW02

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 2 of 3 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	sp: Brown to light gray, wet, fine to coarse SAND, little subangular, coarse, quartz-rich Gravel.	sp		Organic Vapor = 0.3ppm		TF0003		Rec 1.0'/1.0' (0-1' bgs) Geoprobe - ESN - 10/16/01
	1	sp: Olive-gray to light gray to yellowish orange, moist to wet, fine to coarse SAND, little Clay.	sp		Organic Vapor = 0.0ppm		TF0004 TF0005		Rec 2.2'/2.2' (1-3.2' bgs)
	2								
	3	sc: Yellowish orange to white to olive-gray to orange to light brown, wet, medium dense, fine to medium grained SAND, some wet, yellowish orange to light brown Clay, little Silt, little white, medium grained, subangular sandstone Gravel.	sc		Organic Vapor > 20ppm			25 30	Direct push refusal at 3.2' bgs Rec 0.5'/1.0' (3-4' bgs) HSA - Miller Drilling Company - 10/25/01
		NA: No recovery.	NA						
810	4	sc: Yellowish orange to white to olive-gray to orange to light brown, wet, medium dense, fine to medium grained SAND, some wet, yellowish orange to light brown Clay, little Silt, little white, medium grained, subangular sandstone Gravel.	sc		Organic Vapor > 20ppm			47 26 30 33	Rec 1.7'/2.0' (4-6' bgs) Groundwater encountered at 4' bgs
	5								
		NA: No recovery.	NA						
	6	sc: Yellowish orange to white to olive-gray to orange to light brown, wet, medium dense, fine to medium grained SAND, some wet, yellowish orange to light brown Clay, little Silt, little white, medium grained, subangular sandstone Gravel.	sc		Organic Vapor > 20ppm			32 38 54 45	Rec 1.7'/2.0' (6-8' bgs)
	7								
		NA: No recovery.	NA						
	8	sc: Yellowish orange to white to olive-gray to orange to light brown, wet, medium dense, fine to medium grained SAND, some wet, yellowish orange to light brown Clay, little Silt, little white, medium grained, subangular sandstone Gravel.	sc		Organic Vapor > 20ppm			25 35 51 38	Rec 1.5'/2.0' (8-10' bgs)
805	9								
		NA: No recovery.	NA						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: CWM-185-MW02

Project: Fort McClellan | Geologist: Cindy Levaas/Adam Day | Sheet 3 of 3 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	sc: Yellowish orange to white to olive-gray to orange to light brown, wet, medium dense, fine to medium grained SAND, some wet, yellowish orange to light brown Clay, little Silt, little white, medium grained, subangular sandstone Gravel.	sc		Organic Vapor = 0.3ppm			27 26 30 33	Rec 2.0'/2.0' (10-12' bgs)
	12	NA: No sample collected for lithologic description.	NA						
	13	sc: Light brown, wet, soft CLAY, some white to yellowish orange, medium grained Sand.	sc		Organic Vapor = 0.0ppm			0 1 2 1	Rec 0.5'/2.0' (13-15' bgs)
800	14	NA: No recovery.	NA						
	15	NA: No sample collected for lithologic description.	NA						
	16								
	17								
	18	sc: Light brown, wet, soft CLAY, some white to yellowish orange, medium grained Sand, some fine grained, light brown to pink, subangular quartzite Gravel.	sc		Organic Vapor = 2.0ppm			4 8 2 1	Rec 2.0'/2.0' (18-20' bgs)
795	19								
	20								Bottom of borehole at 20' bgs

WELL CONSTRUCTION LOGS

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan, SAD TERC
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Adam Day

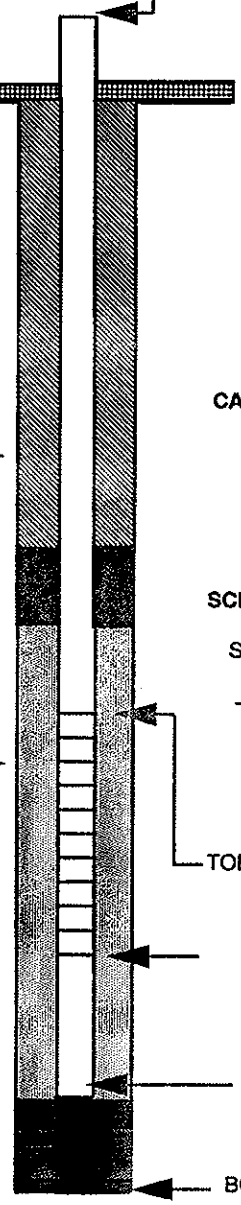
WELL NO: CWM-184-MW01
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 22-OCT-01
NORTHING: 1176371.46
EASTING: 674687.71
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 838936

GROUND SURFACE ELEVATION* 840.59

TOP of WELL CASING or RISER PIPE
EL* 842.8 STICKUP 2.21

SURFACE SEAL
TYPE of SURFACE SEAL: Concrete
MINIMUM THICKNESS: 4 inches

ANNULAR SPACE SEAL TYPE
Grout



APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL
SEAL MATERIAL: Bentonite
SEAL START DEPTH: 23

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 25

CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 40
INSIDE DIAMETER of RISER (inches): 2

SCREEN
TYPE of SCREEN MATERIAL: PVC SCH 40
SLOT SIZE (inches): 0.010
INSIDE DIAMETER (inches): 2

TOP OF SCREENED INTERVAL
EL* 810.59 DEPTH 30

BOTTOM of SCREENED INTERVAL
EL* 795.59 DEPTH 45

BOTTOM of SUMP and WELL
EL* 795.59 DEPTH 45

BOTTOM of BOREHOLE
EL* 793.59 DEPTH 47

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

*All elevations (EL) are referenced to MSL.
All depths and heights are given in feet and are referenced to the ground surface.

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan, SAD TERC
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Adam Day

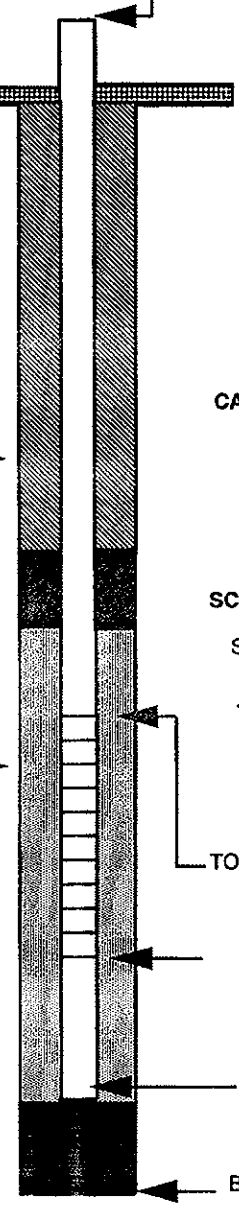
WELL NO: CWM-184-MW02
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 25-OCT-01
NORTHING: 1176321.26
EASTING: 674285.24
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 838936

GROUND SURFACE ELEVATION* 827.08

TOP of WELL CASING or RISER PIPE
EL* 829.17 STICKUP 2.09

SURFACE SEAL
TYPE of SURFACE SEAL: Concrete
MINIMUM THICKNESS: 4 inches

ANNULAR SPACE SEAL TYPE
Grout



APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL
SEAL MATERIAL: Bentonite
SEAL START DEPTH: 7

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 10

CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 40
INSIDE DIAMETER of RISER (inches): 2

SCREEN
TYPE of SCREEN MATERIAL: PVC SCH 40
SLOT SIZE (inches): 0.010
INSIDE DIAMETER (inches): 2

TOP OF SCREENED INTERVAL
EL* 812.08 DEPTH 15

BOTTOM of SCREENED INTERVAL
EL* 797.08 DEPTH 30

BOTTOM of SUMP and WELL
EL* 797.08 DEPTH 30

BOTTOM of BOREHOLE
EL* 795.08 DEPTH 32

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

*All elevations (EL) are referenced to MSL.
All depths and heights are given in feet and are referenced to the ground surface.

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan, SAD TERC
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Adam Day

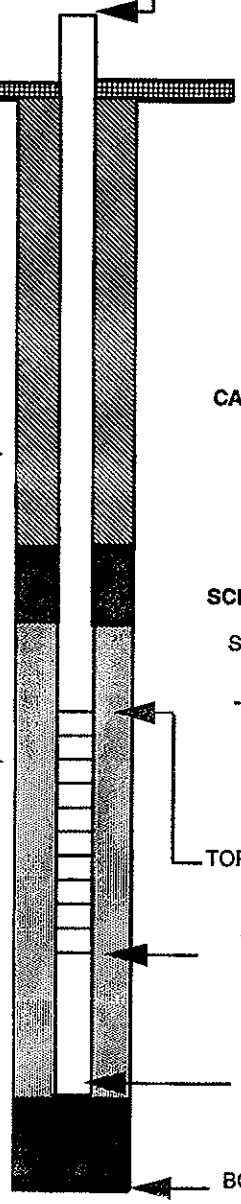
WELL NO: CWM-184-MW03
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 25-OCT-01
NORTHING: 1176526.15
EASTING: 674141.84
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 838936

GROUND SURFACE ELEVATION* 828.35

TOP of WELL CASING or RISER PIPE
EL* 830.4 STICKUP 2.05

SURFACE SEAL
TYPE of SURFACE SEAL: Concrete
MINIMUM THICKNESS: 4 inches

ANNULAR SPACE SEAL TYPE
Grout



APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL
SEAL MATERIAL: Bentonite
SEAL START DEPTH: 12

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 15

CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 40
INSIDE DIAMETER of RISER (Inches): 2

SCREEN
TYPE of SCREEN MATERIAL: PVC SCH 40
SLOT SIZE (inches): 0.010
INSIDE DIAMETER (inches): 2

TOP OF SCREENED INTERVAL
EL* 808.35 DEPTH 20

BOTTOM of SCREENED INTERVAL
EL* 793.35 DEPTH 35

BOTTOM of SUMP and WELL
EL* 793.35 DEPTH 35

BOTTOM of BOREHOLE
EL* 791.35 DEPTH 37

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

*All elevations (EL) are referenced to MSL.
All depths and heights are given in feet and are referenced to the ground surface.

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan, SAD TERC
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Adam Day

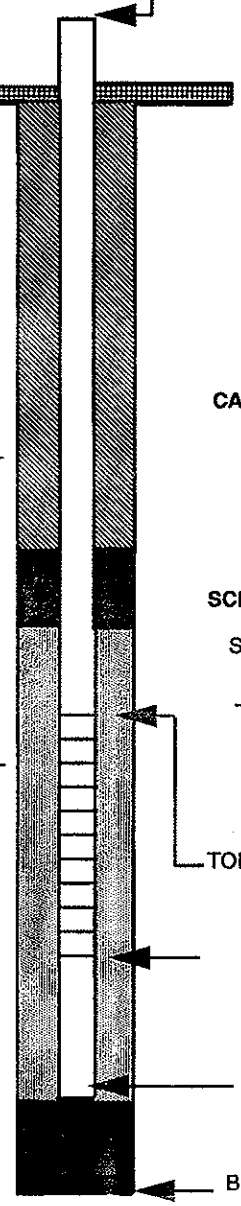
WELL NO: CWM-184-MW04
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 29-OCT-01
NORTHING: 1176466.11
EASTING: 673981.59
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 838936

GROUND SURFACE ELEVATION* 821.95

TOP of WELL CASING or RISER PIPE
EL* 824.2 STICKUP 2.25

SURFACE SEAL
TYPE of SURFACE SEAL: Concrete
MINIMUM THICKNESS: 4 inches

ANNULAR SPACE SEAL TYPE
Grout



APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL
SEAL MATERIAL: Bentonite
SEAL START DEPTH: 2

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 5

CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 40
INSIDE DIAMETER of RISER (inches): 2

SCREEN
TYPE of SCREEN MATERIAL: PVC SCH 40
SLOT SIZE (inches): 0.010
INSIDE DIAMETER (inches): 2

TOP OF SCREENED INTERVAL
EL* 811.95 DEPTH 10

BOTTOM of SCREENED INTERVAL
EL* 801.95 DEPTH 20

BOTTOM of SUMP and WELL
EL* 801.95 DEPTH 20

BOTTOM of BOREHOLE
EL* 799.95 DEPTH 22

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

*All elevations (EL) are referenced to MSL.
All depths and heights are given in feet and are referenced to the ground surface.

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan, SAD TERC
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Adam Day

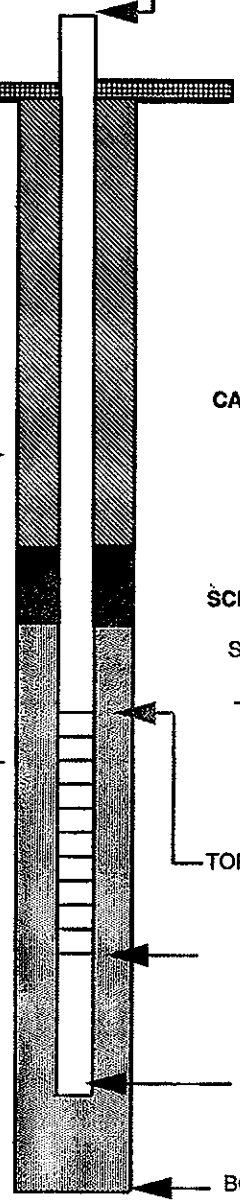
WELL NO: CWM-184-MW05
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 25-OCT-01
NORTHING: 1176332.99
EASTING: 674588.45
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 838936

GROUND SURFACE ELEVATION* 837.39

TOP of WELL CASING or RISER PIPE
EL* 839.29 STICKUP 1.90

SURFACE SEAL
TYPE of SURFACE SEAL: Concrete
MINIMUM THICKNESS: 4 inches

ANNULAR SPACE SEAL TYPE
Grout



CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 40
INSIDE DIAMETER of RISER (inches): 2

APPROXIMATE DIAMETER of BOREHOLE (inches): 8

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	12
Sand No 0	14

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 40	0.010	2

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	19

TOP OF SCREENED INTERVAL
EL* 812.39 DEPTH 25

BOTTOM of SCREENED INTERVAL
EL* 787.39 DEPTH 50

BOTTOM of SUMP and WELL
EL* 787.39 DEPTH 50

BOTTOM of BOREHOLE
EL* 787.39 DEPTH 50

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

*All elevations (EL) are referenced to MSL.
All depths and heights are given in feet and are referenced to the ground surface.

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan, SAD TERC
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Adam Day

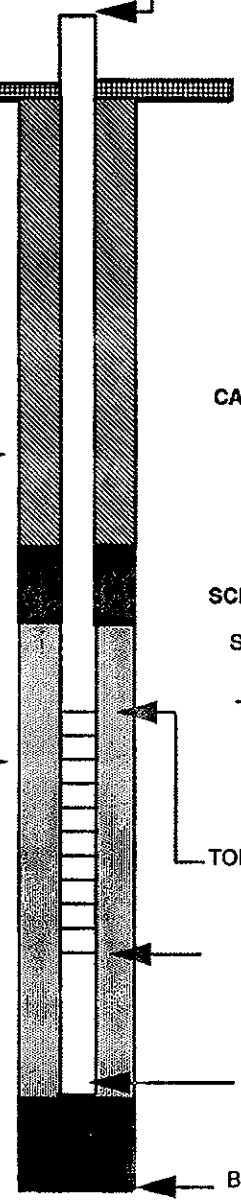
WELL NO: CWM-185-MW01
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 29-OCT-01
NORTHING: 1176139.01
EASTING: 674086.35
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 838936

GROUND SURFACE ELEVATION* 820.26

TOP of WELL CASING or RISER PIPE
EL* 822.19 STICKUP 1.93

SURFACE SEAL
TYPE of SURFACE SEAL: Concrete
MINIMUM THICKNESS: 4 inches

ANNULAR SPACE SEAL TYPE
Grout



CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 40
INSIDE DIAMETER of RISER (inches): 2

APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL
SEAL MATERIAL: Bentonite
SEAL START DEPTH: 2

SCREEN
TYPE of SCREEN MATERIAL: PVC SCH 40
SLOT SIZE (inches): 0.010
INSIDE DIAMETER (inches): 2

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 5

TOP OF SCREENED INTERVAL
EL* 810.26 DEPTH 10

BOTTOM of SCREENED INTERVAL
EL* 795.26 DEPTH 25

BOTTOM of SUMP and WELL
EL* 795.26 DEPTH 25

BOTTOM of BOREHOLE
EL* 793.26 DEPTH 27

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

*All elevations (EL) are referenced to MSL.
All depths and heights are given in feet and are referenced to the ground surface.

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan, SAD TERC
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Adam Day

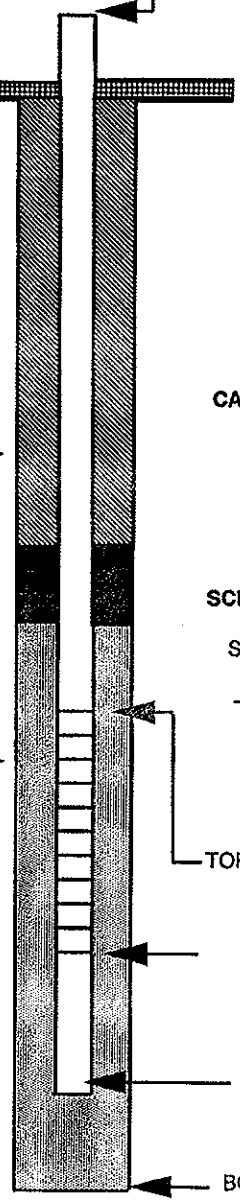
WELL NO: CWM-185-MW02
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 29-OCT-01
NORTHING: 1176193.2
EASTING: 674018.53
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 838936

GROUND SURFACE ELEVATION* 819.14

TOP of WELL CASING or RISER PIPE
EL* 821.24 STICKUP 2.1

SURFACE SEAL
TYPE of SURFACE SEAL: Concrete
MINIMUM THICKNESS: 4 Inches

ANNULAR SPACE SEAL TYPE
Grout



APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL
SEAL MATERIAL: Bentonite
SEAL START DEPTH: 2

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 5

CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 40
INSIDE DIAMETER of RISER (inches): 2

SCREEN
TYPE of SCREEN MATERIAL: PVC SCH 40
SLOT SIZE (inches): 0.010
INSIDE DIAMETER (inches): 2

TOP OF SCREENED INTERVAL
EL* 809.14 DEPTH 10

BOTTOM of SCREENED INTERVAL
EL* 799.14 DEPTH 20

BOTTOM of SUMP and WELL
EL* 799.14 DEPTH 20

BOTTOM of BOREHOLE
EL* 799.14 DEPTH 20

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

*All elevations (EL) are referenced to MSL.
All depths and heights are given in feet and are referenced to the ground surface.

APPENDIX C

WELL DEVELOPMENT LOGS

Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 796 887
Form Completed by: Lee Flippen
Well Developed by (person/firm): Lee FLIPPEN / IT Corp.

Parcel No.: CWM 184
Well No.: MW 01
Date started: 10-29-01

Monitoring Well Information

Development Method: Surge + purge
Development Equipment: whale Pumps + 12v. Battery, Horiba # 906004, Aquafast #2028, Heron # 2044
Casing Diameter: 2" .163

Beginning Measurments
Depth to Water (ft): 26.27 TOC
Total depth of Well (ft): 47.57 TOC

WC = 21.3 ft. FID # 844301 = 4.2, BKG = 0.0, screen = 30-45 ft.

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									- Surged Entire Screen -
13:10	Ø	26.27	4.79	.047	999+	1.14	16.4	Brown	Depth 45 ft. PR 1.0 gpm
13:25	15.0	38.21	4.93	.041	1662	3.11	16.4	orange	Depth 45 ft. PR .25 gpm
13:40	18.75	38.49	5.04	.036	123	3.60	17.0	cloudy	Depth 45 ft. PR .25 gpm
13:55	22.5	39.16	5.40	.037	103	3.58	17.1	cloudy	Depth 45 ft. PR .25 gpm
14:10	26.25	39.78	5.52	.037	167	3.43	17.0	cloudy	Depth 45 ft. PR .25 gpm
14:25	30.0	40.49	5.46	.035	62	3.13	16.8	cloudy	Depth 45 ft. PR .25 gpm
14:40	33.75	40.89	5.46	.032	50	3.42	16.8	cloudy	Depth 45 ft. PR .2 gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

47.57 - 26.27 = 21.3 x .163 = 3.47 x 5 = 17.36 + 120 g = 137.36 g

orig. [illegible]
10/31/01

Parcel No.: CWM 184
Well ID: MW01
Date: 10-23-01

10-30-01 NO PID'S AVAILABLE WC = 21.16 ft LEE FLIPPEN

Time 24hr	33.75 Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
14:55	36.75	40.89	5.32	.029	88	3.57	16.7	cloudy	recharge Rate = .2 gpm Depth 45 ft. PR .2 gpm
15:10	39.75	40.89	5.27	.026	63	3.63	16.7	cloudy	Depth 45 ft. PR .25 gpm
15:25	43.5	41.38	5.28	.028	167	4.20	16.3	cloudy	Depth 45 ft. PR .25 gpm
15:40	47.25	42.33	5.08	.022	176	3.80	16.2	cloudy	Depth 45 ft. PR .25 gpm
15:55	51.0	41.79	5.08	.022	28	3.86	16.3	clear	Depth 45 ft. PR .25 gpm
16:10	54.75	41.45	5.07	.021	5.7	3.93	16.2	clear	— Stopped parameters — 3 hrs. Depth 45 ft. ~~[illegible]~~
10-30-01 10:05	54.75	26.41	5.04	.088	999+	4.31	16.5	orange	Depth 45 ft. PR .25 gpm — Moved to 32 ft. —
10:20	58.50	30.30	4.95	.026	422	3.77	16.7	orange	Depth 45 ft. PR .25 gpm
10:35	62.25	30.69	4.95	.024	127	4.52	17.6	cloudy	Depth 32 ft. PR .2 gpm
10:50	65.25	31.51	5.02	.024	190	4.33	17.7	cloudy	Depth 34 ft. PR .25 gpm
11:05	69.0	33.96	4.98	.024	88	3.72	17.9	cloudy	Depth 36 ft. PR .25 gpm
11:20	72.75	35.73	5.18	.026	47	4.66	17.0	cloudy	Depth 38 ft. PR .25 gpm
11:35	76.5	37.35	5.03	.025	91	4.28	17.0	cloudy	Depth 40 ft PR .25 gpm

Parcel No.: CWM 184
Well ID: MW 01
Date: 10-30-01

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:50	80.25	38.52	5.08	.024	28	4.31	17.2	clear	Depth 42 ft. PR .25 gpm
12:05	84.0	38.62	5.04	.022	285	3.81	17.9	orange	Depth 44 ft PR .25 gpm
12:20	87.75	38.48	5.08	.027	696	4.30	18.4	orange	Depth 44 ft. PR .25 gpm
12:35	91.5	39.12	4.92	.022	142	3.63	17.6	cloudy	Depth 44 ft. PR .25 gpm
12:50	95.25	39.31	4.95	.023	400	3.92	17.7	orange	Depth 44 ft. PR .25 gpm
13:05	99.0	39.39	4.93	.023	356	3.75	17.5	orange	Depth 44 ft PR .25 gpm
13:20	102.75	39.67	4.99	.021	67	3.19	17.5	clear	Depth 44 ft. PR .25 gpm
13:35	106.5	39.12	5.02	.022	28	3.89	17.5	clear	Depth 44 ft PR .25 gpm
13:50	110.25	39.97	5.00	.022	12.8	4.02	17.4	clear	Depth 44 ft PR .25 gpm
14:05	114.0	40.33	5.01	.022	6.1	4.22	17.5	clear	Depth 44 ft PR .25 gpm
14:20	117.75	40.73	5.10	.023	6.4	4.41	17.5	clear	Depth 44 ft. PR .25 gpm
14:35	121.5	41.31	5.23	.021	4.9	3.72	17.4	clear	Depth 44 ft. PR .25 gpm
14:50	125.25	41.43	4.92	.020	4.1	3.63	17.4	clear	Depth 44 ft. PR .25 gpm
15:05	129.0	41.68	4.93	.019	3.1	3.65	17.4	clear	8 hrs - Well Development Completed ~~[illegible]~~ 10-30-01

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 796887
Form Completed by: Lee FLIPPEN
Well Developed by (person/firm): Lee FLIPPEN / IT corp.

Parcel No.: CWM 184
Well No.: MW02
Date started: 11-12-01

Monitoring Well Information

Development Method: Surge + purge
Development Equipment: whale pumps, 12v. Battery
Horiba U-10 # 906004, Aquafast II # 2028, Hanna # 2044
Casing Diameter: 2" .163

Beginning Measurments
Depth to Water (ft): 13.80' TOC
Total depth of Well (ft): 32.20' TOC

PID 4.0 BZ 0.0 screen 15-30' WC = 18.4 ft.

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									- Surged Entire well Screen -
14:25	Ø	13.80	6.08	.148	999+	3.72	17.3	Brown	Depth 30' PR 1.0 gpm
14:40	15.0	27.08	5.89	.138	999+	3.96	17.1	Brown	Depth 30' PR .23 gpm
14:55	18.45	26.76	5.81	.143	999+	3.79	17.8	Brown	Depth 30' PR .20 gpm
15:10	21.45	28.12	6.18	.146	999+	5.02	17.9	Brown	Depth 30' PR .2 gpm
15:25	24.45	29.22	6.30	.150	999+	4.13	17.6	Brown	Depth 32' PR .10 gpm
15:40	25.95	29.72	6.41	.148	999+	3.87	17.4	Brown	Depth 32' PR .10 gpm
15:55	27.45	30.71	6.28	.154	999+	3.58	17.6	Brown	Depth 32' PR .1 gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

32.20 - 13.80 = 18.4 x .163 = 3.0 x 5 = 15 + 120 g = 135 g

add by

D:\FTMC\DEVELOPMENTLOG.DOC
11/17/00

Parcel No.: CWM 184
Well ID: MW 02
Date: 11-12-01

11-14-01 PID 0.0 BZ 0.0 DTW 15.73' WC = 16.47'

11-13-01 PID 0.3 BZ 0.0 DTW = 17.08 WC = 15.12 ft.

Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
16:00	27.95	Dry	well	RAN	Dry	wait 20min			well Purged Dry – Wait 20 min. And check W.L. For 80% recharge.
16:20	27.95	29.06	80% = – well	18.4 × .80 = 14.72 WC – (32.20 TD) = 17.48 ft Did not	recover	80%	Recovery	water level Rate =	11-12-01 ~~[illegible]~~ 32.2 – 29.06 = 3.14/20 min = .16 ft/min
11-13-01 07:30	27.95	17.08	5.48	.198	501	4.78	14.6	cloudy	Depth 30 ft. PR .132 gpm
07:45	29.93	20.90	6.25	.127	999+	4.87	14.7	Brown	Depth 30 ft. PR .132 gpm
08:00	31.91	22.55	6.17	.114	999+	6.21	15.3	Brown	Depth 30 ft. PR .132 gpm
08:15	33.89	24.45	6.39	.121	999+	6.39	15.1	Brown	Depth 30 ft. PR .132 gpm
08:30	35.87	26.58	6.49	.146	928	6.65	16.1	Brown	Depth 30 ft. PR .132 gpm
08:45	37.85	28.02	6.61	.153	999+	6.73	15.5	Brown	Depth 30 ft. PR .132 gpm
09:00	39.83	29.58	6.63	.156	667	6.61	15.9	Brown	Depth 32 ft PR .132 gpm
09:15	41.81	30.50	6.74	.157	999+	5.57	16.6	Brown	Depth 32 ft. PR .132 gpm
09:26	43.0	well	RAN	Dry –	Wait 20 mins +	check W.L.			– Well purged Dry – check W.L. in 20 min.
09:46	43.0	29.01	recharge rate = 29.01 – 32.20 = 3.15 ÷ 20 = .16 ft/min. – well	Did not	recharge	80% =	17.48 ft.	water level	– Stopped well Development – ~~[illegible]~~ – 11-13-01
11-14-01 08:25	43.0	15.73	5.62	.102	472	5.44	14.7	cloudy	11-14-01 PID 0.0 WC 16.47' Depth 20 ft. PR .10 gpm
08:40	44.5	17.20	5.80	.091	999+	5.77	15.4	cloudy	Depth 22 ft. PR .15 gpm

Parcel No.: CWM 184
Well ID: MW 02
Date: 11-14-01

11-14-01 PID 0.0 WC 16.47 DTW 15.73

Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
08:55	46.75 LF 11-14-01 46.75	18.32	6.00	.086	897	5.85	16.0	Brown	Depth 24 ft. PR .15 gpm
09:10	49.0	19.10	6.04	.087	999+	5.86	16.9	Brown	Depth 26 ft. PR .15 gpm
09:25	51.25	20.60	6.09	.084	999+	5.71	19.6	Brown	Depth 28 ft. PR .15 gpm
09:40	53.5	23.88	6.36	.098	999+	5.96	19.7	Brown	Depth 30 ft. PR .10 gpm
09:55	55.0 55.0 LF 11-14-01	24.73	6.41	.115	999+	5.77	19.9	Brown	Depth 30 ft. PR .10 gpm
10:10	56.5	25.92	6.41	.114	999+	5.87	20.7	Brown.	Depth 30 ft. PR .10 gpm
10:25	58.0	26.80	6.50	.110	999+	6.10	19.7	Brown	Depth 30 ft. PR .10 gpm
10:40	59.5	28.5	6.41	.118	999+	6.02	19.5	Brown	Depth 30 ft. PR .10 gpm
10:55	61.0	29.83	6.42	.130	774	6.15	18.8	Brown	Depth 32 ft. PR .10 gpm
11:10	62.5	30.49	6.58	.151	999+	6.31	18.3	Brown	Depth 32 ft. PR .10 gpm
11:20	63.5	Well RAN Dry - 3x			Well RAN Dry - Well Developed				11-14-01 ~~Lee Flippen~~
:									
:									

Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 796887
Form Completed by: Lee FLIPPEN
Well Developed by (person/firm): Lee FLIPPEN / IT corp.

Parcel No.: CWM 184
Well No.: MW 03
Date started: 11-8-01

Monitoring Well Information

Development Method: Surge + purge
Development Equipment: whale pumps, 12v. Battery, Horiba U-10 #906004, AquaTest II #2028, Heron #2044
Casing Diameter: 2" .163

Beginning Measurments
Depth to Water (ft): 15.60 ft. TOC
Total depth of Well (ft): 37.88 ft. TOC

PID 0.2 BZ 0.0 WC = 22.28 ft. screen 20-35 ft.

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									- Surged Entire well - (Screened Interval)
09:35	Ø	15.60	7.48	.244	999+	2.86	16.2	Brown	Depth 35 ft. PR .65 gpm
09:50	9.75	26.84	7.67	.225	999+	2.91	17.1	Brown	Depth 35 ft. PR .3 gpm
10:05	14.25	27.33	7.87	.222	999+	3.03	16.7	Brown	Depth 35 ft. PR .3 gpm
10:20	18.75	28.91	7.99	.214	999+	3.43	16.4	Brown	Depth 35 ft. PR .3 gpm
10:35	23.25	33.99	8.18	.219	999+	3.01	17.0	Brown	Depth 35 ft. PR .2 gpm
									- Moved to 37 ft. -
10:50	26.25	34.93	7.98	.218	999+	2.23	16.8	Brown	Depth 35 ft PR .2 gpm
11:05	29.25	35.09	8.32	.217	999+	3.46	17.9	Brown	Depth 37 ft. PR .10 gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

37.88 - 15.60 = 22.28 x .163 = 3.63 x 5 = 18.15 + 120 g = 138.15 g

QC'd by [illegible] 11/14/01

Parcel No.: CWM 184
Well ID: MW03
Date: 11-8-01

11-12-01 PID 0.4 BZ 0.0, wc = 20.17 ft. Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:20	30.75	35.89	8.26	.217	425	3.57	18.4	orange	Depth 37ft PR .10 gpm
11:30	31.75 ~~30~~ LF 11-8-01	well Dry			well Purged Dry				—Wait 20 min + recheck W.L.—
11:50	31.75	33.27	wc =	22.28ft.	x .80 =	17.82ft —	(37.88) =	20.06 W.L.	808 = water level 20.06 ft. [illegible] 11-8-01
11-12-01 08:55	31.75	17.71	6.62	.252	42	5.40	15.2	cloudy	Depth 20ft. PR .20 gpm
09:10	34.75	21.05	7.51	.234	19.4	5.15	16.4	clear cloudy	—Moved to 22ft.— Depth 22ft. PR .2 gpm
09:25	37.75	24.52	7.50	.234	29	4.71	16.5	cloudy	Depth 24ft, 5min. Depth 26ft. 10min. PR .2gpm
09:40	40.75	24.91	7.41	.233	94	4.93	17.4	cloudy	Depth 28ft. PR .2gpm
09:55	43.75	25.57 LF 11-8-01 25.57	7.40	.231	114	4.47	17.3	cloudy	Depth 30ft. PR .20gpm
10:10	46.75	26.18	7.48	.230	194	5.01	17.3	cloudy	Depth 30ft. PR .20gpm
10:25	49.75	27.98	7.53	.227	131	5.03	17.2	cloudy	Depth 32ft. PR .2gpm
10:40	52.75	29.96	7.49	.230	195	4.76	17.2	cloudy	Depth 34ft. PR .2gpm
10:55	55.75	30.93	7.58	.226	579	4.80	17.2	cloudy	Depth 36ft. PR .2gpm
11:10	58.75	33.03	7.55	.227	918	4.96	17.6	cloudy	Depth 35ft. PR .2gpm
11:25	61.75	34.15	7.67	.234	999+	5.10	17.8	Brown	Depth 37ft. PR .2gpm

Parcel No.: CWM 184
Well ID: MW 03
Date: 11-12-01

11-13-01 PID 0.0 BZ 0.0 , WC = 21.99 ft. Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11:40	64.75	35.08	7.68	.225	999+	5.18	18.1	Brown	Depth 37 ft. PR .2 gpm
11:53	67.35	Dry	well	purged	Dry				well Dry 2nd Time wait 20 min. + check W.L.
12:13	67.35	33.31	Well	Did not	recover	80%	= 20.06 WL		Stopped Well Development For the DAY - ~~[illegible]~~ 11-12-01
11-13-01 12:20	67.35	15.89	7.69	.238	429	4.68	16.2	Brown	Depth 35 ft. PR .132 gpm
12:35	69.33	21.69	7.91	.237	231	4.95	17.8	cloudy	Depth 35 ft. PR .132 gpm
12:50	71.31	23.28	8.06	.232	116	5.34	17.9	cloudy	Depth 35 ft. PR .15 gpm
13:05	73.56	23.42	8.00	.231	76	5.30	18.0	cloudy	Depth 35 ft. PR .2 gpm
13:20	76.56	26.00	7.95	.230	237	5.46	17.8	cloudy	Depth 35 ft. PR .2 gpm
13:35	79.56	28.07	8.02	.233	259	6.30	18.1	cloudy	Depth 35 ft. PR .10 gpm
13:50	81.06	29.71	8.02	.231	356	5.31	18.9	cloudy	Depth 35 ft. PR .10 gpm
14:05	82.56	29.11	8.04	.232	153	5.88	19.2	cloudy	Depth 35 ft. PR .10 gpm
14:20	84.06	29.12	8.16	.235	316	5.77	19.2	cloudy	Depth 35 ft. PR .10 gpm
14:35	85.56	29.25	8.03	.235	135	5.08	19.1	cloudy	Depth 35 ft. PR .10 gpm

Parcel No.: CWM 184
Well ID: MW03
Date: 11-13-01

Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
14:50	87.06	29.15	8.05	.234	224	4.74	19.2	cloudy	Depth 35 ft. PR .10 gpm
15:05	88.56	29.75	8.03	.235	109	4.43	18.4	cloudy	Depth 35 ft. PR .10 gpm
15:20	90.06	30.33	7.93	.233	90	4.71	17.7	cloudy	Depth 35 ft. PR .10 gpm
15:35	91.56	30.51	7.98	.232	84	4.89	17.2	cloudy	-8 hrs Development Time- Well Development Completed. 11-13-01 [signature]
:									
:									
:									
:									
:									
:									
:									
:									
:									
:									

[signature] 11-13-01

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 796887
Form Completed by: Lee FLIPPEN
Well Developed by (person/firm): Lee FLIPPEN / IT corp.

Parcel No.: CWM 184
Well No.: MW 04
Date started: 11-16-01

Monitoring Well Information

Development Method: surge + purge
Development Equipment: whale pumps, 12v. Battery
Horiba U-10 #906004, AquaPAST II 2028, Horan # 2038
Casing Diameter: 2" .163

Beginning Measurments
Depth to Water (ft): 9.52' TOC
Total depth of Well (ft): 22.63 TOC

11-16-01 PID 0.2 BZ 0.0 Screen 10'-20' WC = 13.11

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									— Surged Entire Screen —
08:05	Ø	9.52	6.51	.291	999+	.88	14.6	Brown	Depth 20' PR .20gpm
08:20	3.0	13.13	6.74	.202	359	1.75	16.3	Brown	Depth 20' PR .20gpm
08:35	6.0	14.01	7.07	.244	999+	2.01	16.9	Brown	Depth 20' PR .20gpm
08:50	9.0	15.99	6.99	.240	999+	1.17	17.6	Brown	Depth 20' PR .20gpm
09:05	12.0	17.83	6.99	.246	434	.84	17.1	Brown	Depth 20' PR .20gpm
1hr. 09:20	15.0	19.13	7.16	.281	289	.75	17.1	Brown	Depth 22' PR .15gpm
09:35	17.25	19.97	6.95	.245	123	.71	16.3	Brown	Depth 22' PR .15gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

22.63 - 9.52 = 13.11 X .163 = 2.14 X 5 = 10.7 + 120g = 130.7g

QC'd [signature] 11/28/01

Parcel No.: CWM 184
Well ID: MW04
Date: 11-16-01 / 11.28.01

Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
09:50	19.5	19.97	6.90	.240	166	.86	16.4	cloudy	Depth 22 ft. PR .10 gpm
10:05	21.0	19.21	6.84	.248	176	.83	18.3	cloudy	Depth 22 ft. PR .10 gpm
10:20	22.5	20.27	6.93	.250	205	.92	19.0	cloudy	Depth 22 ft. PR .10 gpm
10:35	24.0	20.48	7.00	.252	213	1.04	19.9	cloudy	Depth 22 ft. PR .10 gpm
10:50	25.5	20.80	7.04	.255	218	.96	20.3	cloudy	Depth 22 ft. PR .10 gpm
11:05	27.0	21.02	7.08	.259	162	.93	21.1	cloudy	Depth 22 ft. PR .10 gpm
11:20	28.5	21.18	7.08	.262	148	.83	21.5	cloudy	Depth 22 ft. PR .10 gpm
11:35	30.0	21.43	7.17	.268	342	1.01	21.6	Cloudy	Depth 22 ft. PR .10 gpm
11:38	30.0	well	RAN	Dry	wait	20 min.	and check	W.L.	80% Recovery = 13.11 x .80 = 10.49 ft 22.63 TD − 10.49 ft = 12.14 ft water level
11:58	30.0	21.58 well Did NOT	recover	80%	Recharge	Rate =	.05 ft/min	21.58 − 22.63 = 1.05 / 20 min = .05 ft/min.	Stopped ~~Dataloggers~~ 11-16-01 ~~[illegible]~~
									Resumed development for 11.28.01 Pump at 20' toc. PR = .04 gpm
~~08:15~~	~~30.0~~	9.49	—	—	—	—	—	—	
08:30	30.6	12.18	6.46	.257	46	5.56	17.4	clear	"
08:45	31.2	13.09	6.90	.216	144	5.74	18.7	Tan	"

Parcel No.: 184
Well ID: CWM-184-MW04
Date: 11.28.01

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
09:00 ~~09:45~~	31.8 ~~31.2~~	13.05	6.78	.233	195	5.64	19.0	Tan	Pump raised to 19' btoc.
09:15	32.4	13.09	7.02	.220	195	5.45	19.3	"	"
09:30	33.0	13.09	7.06	.223	195	5.58	20.0	"	"
09:45	33.6	13.34	7.04	.219	180	5.61	20.0	Tan / light tan	"
10:00	34.2	13.84	6.92	.235	163	5.75	19.8	"	Pump raised to 18' btoc
10:15	34.8	14.22	7.06	.220	136	5.59	20.1	"	"
10:30	35.4	14.48	7.11	.239	135	5.70	20.9	"	"
10:45	36.0	14.84	7.04	.233	113	5.65	23.7	"	"
11:00	36.6	15.12	7.05	.235	124	5.71	23.9	"	"
11:15	37.2	15.55	6.97	.235	133	5.65	25.5	"	"
11:30	37.8	15.82	7.01	.233	134	5.75	25.9	"	Pump lowered to 19' btoc
11:45	38.4	16.30	7.03	.230	105	5.70	26.0	light tan	"
12:00	39.0	16.55	6.95	.230	105	5.72	26.5	"	"

Parcel No.: 184
Well ID: CWM-184-MW04
Date: 11.28.01

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
12:15	39.6	16.90	7.00	.232	87	5.69	26.7	light tan	Pump set 19' BTOC.
12:30	40.2	17.22	7.01	.229	98	5.71	26.7	"	"
12:45	40.8	17.49	7.00	.231	92	5.70	26.9	"	1 hr development reached. 1 L HDPE photo sample taken.
:									
:									
:									
:									
:									
:									
:									
:									
:									
:									

Jason Pauly 11.28.01

Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 796887
Form Completed by: Lee FLIPPEN
Well Developed by (person/firm): Lee FLIPPEN / IT Corp.

Parcel No.: CWM 184
Well No.: MW05
Date started: 11-14-01

Monitoring Well Information

Development Method: Surge + Purge
Development Equipment: whale pumps, 12v. Battery
Horiba U-10 #906004, AquaFAST II #2028, Horon #2038
Casing Diameter: 2" .163

Beginning Measurments
Depth to Water (ft): 23.33 TOC
Total depth of Well (ft): 52.00 TOC

11-14-01 PTD 5.1 BZ 0.0 WC = Screen 25'-50'

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									- Surged Entire Screen -
13:55	Ø	23.33	6.86	.350	999+	1.15	18.2	Brown	Depth 50 ft. PR 1.0 gpm
14:10	15.0	33.03	6.75	.310	999+	1.30	17.4	Brown	Depth 50 ft. PR 1.0 gpm
14:25	30.0	36.35	6.55	.296	999+	2.62	16.8	Brown	Depth 50 ft. PR .6 gpm
14:40	39.0	40.96	6.61	.278	999+	2.78	16.8	Brown	Depth 50 ft. PR .6 gpm
14:55	48.0	43.13	6.69	.267	999+	3.28	16.6	Brown	Depth 50 ft. PR .4 gpm
15:10	54.0	41.44	6.70	.216	999+	4.26	16.9	Brown	Depth 50 ft. PR .35 gpm
15:25	59.25	40.58	6.75	.202	269	4.56	16.9	Brown	Depth 50 ft. PR .25 gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

52.00 - 23.33 = 28.67 x .163 = 4.67 x 5 = 23.35 + 270 g = 293.35 g

[illegible]
11/26/01

Parcel No.: CWM 184
Well ID: MW05
Date: 11-14-01

11-15-01 PID 0.0 BZ 0.0 , DTW = 23.50' , WC = 28.50' Lee FLIPPEN Cindy LEVAAS

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
15:40	63.0	39.55	6.71	.212	135	4.81	17.1	cloudy	Depth 50 ft PR .7 gpm
15:55	73.5	41.48	6.52	.188	879	5.05	16.5	Brown	Depth 52 ft. PR .7 gpm
16:10	84.0	46.05	6.60	.230	999+	5.11	16.3	Brown	Depth 52 ft. ~~[illegible]~~ -Stopped parameters- 11-14-01
07:35	84.0	~~38.~~ 23.50	5.37	.205	250	6.32	11.2	cloudy	Depth 30 ft PR .3 gpm
07:50	88.5	27.77	6.33	.177	881	6.16	13.2	Brown	Depth 32 ft PR .5 gpm
08:05	96.0	30.73	6.80	.241	999+	6.72	14.9	Brown	Depth 34 ft PR .5 gpm
08:20	103.5	34.08	6.94	.237	999+	6.15	15.0	Brown	Depth 36 ft PR .5 gpm
08:35	111.0	36.00	6.88	.225	999+	5.96	15.2	Brown	Depth 38 ft PR .5 gpm
08:50	118.5	36.87	6.77	.207	999+	5.72	15.3	Brown	Depth 40 ft PR .5 gpm
09:05	126.0	38.02	6.74	.200	850	5.44	15.6	Brown	Depth 42 ft PR .5 gpm
09:20	133.5	40.23	6.74	.201	999+	6.00	15.8	Brown	Depth 44 ft PR .5 gpm
09:35	141.0	40.69	6.70	.188	607	5.59	15.9	Brown	Depth 46 ft PR .5 gpm
09:50	148.5	41.96	6.69	.196	999+	5.81	16.0	Brown	Depth 48 ft PR .5 gpm

Parcel No.: CWM 184
Well ID: MW05
Date: 11-15-01
Lee FLIPPEN
Cindy LeVAAS

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
10:05	156.0	43.19	6.65	0.192	999+	5.53	16.2	brown	Depth 50 ft PR .5gpm
10:20	173.5	44.89	6.60	0.180	999+	5.61	16.2	brown	Depth 50 ft PR .5gpm
10:35	181.0	46.09	6.58	0.174	999+	5.84	16.3	brown	Depth 50 ft PR .3gpm
10:50	185.5	47.94	6.93	0.216	999+	5.30	16.3	brown	Depth 50 ft PR .3gpm
11:05	190.0	47.40	6.81	0.194	999+	5.71	16.8	brown	Depth 50 ft ~~PR~~ Stopped ① parameters/pump
12:35	190.0	29.10	6.86	0.203	999+	6.14	17.9	brown	Restart pump Depth 50 ft PR .7gpm
12:50	200.5	37.02	6.65	0.181	999+	6.64	17.4	brown	Depth ~~50~~ 42 ft PR .4gpm
13:05	206.5	39.49	6.46	0.186	999+	6.43	17.2	brown	Depth 42 ft PR .25gpm
13:20	210.3	39.23	6.34	0.168	807	5.58	17.2	brown	Depth 42 ft PR .25gpm
13:35	214.1	39.26	6.27	0.161	479	4.99	17.4	brown	Depth 42 ft PR .25gpm
13:50	217.9	39.43	6.36	0.162	212	4.98	17.5	cloudy	Depth 42 ft PR .25gpm
14:05	221.6	39.45	6.43	0.155	137	5.12	17.4	cloudy	Depth 42 ft PR .25gpm
14:20	225.3	39.52	6.50	0.159	104	4.96	17.2	cloudy	Depth 42 ft PR ~~.25~~ ② 0.10 gpm

Parcel No.: CWM 184
Well ID: MW05
Date: 11-15-01

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
14 : 35	226.8	38.23	6.47	0.147	19.7	4.89	17.6	clear	Depth 42ft PR 0.10gpm
14 : 50	228.3	37.13	6.46	0.146	10.0	5.54	17.6	clear	8 hours development time reached well development completed 1L photo sample taken
:									
:									
:									
:									
:									
:									
:									
:									
:									
:									
:									

Andy Lewis 11/15/01

Groundwater Well Development Log

Fort McClellan , Alabama

Project Number: 796887
Form Completed by: Lee FLIPPEN
Well Developed by (person/firm): Lee FLIPPEN /IT Corp.

Parcel No.: CWM 18S
Well No.: MW 01
Date started: 11-01-01

Monitoring Well Information

Development Method: Surge + Purge
Development Equipment: Horiba U-10 #966004, AquaFast II #2028, Heron #2044, whale Pumps + 12v. Battery
Casing Diameter: 2" .163

Beginning Measurments
Depth to Water (ft): 7.19 ft. TOC
Total depth of Well (ft): 27.68 ft. TOC

PID 0.3 BZ 0.0 screen 10-25'

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									- Surged Entire well -
10:50	Ø	7.19	7.02	.302	999+	2.15	18.8	Brown	Depth 25' PR 1.0 gpm 11-01-01
11:05	15.0	23.78	6.92	.246	999+	3.84	18.2	Brown	Depth 25' PR .45 gpm
11:20	21.75	18.13	7.12	.233	714	4.38	18.5	orange	Depth 25' PR .45 gpm
11:35	28.5	16.82	7.13	.231	187	4.58	18.3	cloudy	Depth 25 ft PR .45 gpm
11:50	35.25	17.18	7.25	.230	269	4.15	17.7	cloudy	Depth 25 ft. PR .6 gpm
12:05	44.25	17.74	7.29	.229	163	4.34	18.0	cloudy	Depth 23 ft. PR .6 gpm
12:20	50.25	17.88	7.38	.228	164	4.41	17.9	cloudy	Depth 21 ft. PR .6 gpm

TD - DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

27.68 - 7.19 = 20.49 x .163 = 3.34 x 5 = 16.7 + 120 g = 136.7 g

rec'd - [illegible] 11-5-01

Parcel No.: CWM 185
Well ID: MW01
Date: 11-01-01

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
12:35	59.25	17.69	7.43	.227	145	4.47	18.1	cloudy	Depth 19 ft. PR .60 gpm
12:50	68.25	17.22	7.43	.227	75	4.41	18.0	cloudy	Depth 21 ft. PR .60 gpm
13:05	77.25	17.04	7.38	.225	119	4.37	17.7	cloudy	Depth 23 ft. PR .6 gpm
13:20	86.25	16.83	7.36	.226	81	4.69	17.7	cloudy	Depth 25 ft. PR .75 gpm
13:35	97.5	19.29	7.19	.234	827	5.01	17.3	orange	Depth 25 ft PR .75 gpm
13:50	108.75	21.74	7.30	.230	915	4.39	17.2	orange	Depth 25 ft. PR .75 gpm
14:05	120.0	23.31	7.33	.227	999+	4.95	17.2	orange	Depth 25 ft. PR .4 gpm
14:20	126.0	19.26	7.33	.226	235	4.14	17.9	cloudy	Depth 25 ft. PR .4 gpm
14:35	132.0	17.11	7.38	.224	62	4.49	17.6	cloudy	Depth 23 ft. PR .4 gpm
14:50	138.0	16.65	7.36	.224	46	4.29	17.5	cloudy	– Reached target P.V. – Depth 23 ft. PR .2 gpm
15:05	141.0	12.98	7.37	.224	18.5	4.20	18.9	clear	Depth 23 ft. PR .2 gpm
15:20	144.0	9.41	7.38	.224	18.0	4.21	19.1	clear	Depth 23 ft. PR .2 gpm
15:35	147.0	8.71	7.30	.224	33.0	4.18	19.2	clear	– stopped parameters – ~~Last stopped~~ 11-01-01

Parcel No.: CWM 185
Well ID: MW 01
Date: 11-02-01

11-02-01 – PID 0.0, BZ 0.0, wc = 20.01 ft.

Lee FLIPPEN

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
07:55	147.0	7.18	6.64	.247	96	4.47	17.0	cloudy orange	Depth 25 ft. PR .10 gpm
08:10	149.5	8.02	7.07	.228	186	4.07	18.4	cloudy	Depth 10 ft. PR .10 gpm
08:25	150.0	7.82	7.49	.228	135	4.74	19.5	cloudy	Depth 10 ft. PR .10 gpm
08:40	151.5	7.97	7.50	.228	182	4.47	19.5	cloudy	Depth 23 ft. PR .10 gpm
08:55	153.0	7.81	7.51	.227	136	4.34	19.0	cloudy	Depth 23 ft. PR .10 gpm
09:10	154.5	8.02	7.55	.226	50	4.13	19.2	cloudy	Depth 23 ft. PR .10 gpm
09:25	156.0	8.03	7.55	.226	27	4.57	19.4	clear	Depth 23 ft. PR .10 gpm
09:40	157.5	7.97	7.51	.227	15.8	3.67	19.7	clear	Depth 23 ft. PR .10 gpm
09:55	159.0	7.98	7.50	.226	11.6	3.80	19.8	clear	Depth 23 ft. PR .10 gpm
10:10	160.5	7.97	7.46	.226	9.6	4.02	20.1	clear	Depth 23 ft. PR .10 gpm
10:25	162.0	7.98	7.47	.226	9.6	4.28	20.3	clear	Depth 23 ft. PR .10 gpm
10:40	163.5	7.98	7.43	.226	7.8	4.26	20.9	clear	well Developped - 7½ hrs development Time ~~Lee Flippen~~ 11/02/01
									Took 1L. Photo Sample

Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 796887
Form Completed by: Lee FLIPPEN
Well Developed by (person/firm): Lee FLIPPEN / IT Corp.

Parcel No.: CWM 185
Well No.: MW02
Date started: 10-31-01

Monitoring Well Information

Development Method: surge + Purge
Development Equipment: whale pumps, Horiba U-10 #906004, AquaFast II #2028, Heron #2044, PID #82379
Casing Diameter: 2" .163

Beginning Measurments
Depth to Water (ft): 6.22' TOC
Total depth of Well (ft): 22.78' TOC

10-31-01 PID 0.3 BKG 0.0 Screen 10-20'

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
									- Surged Entire Screen -
08:25	Ø	6.22	5.91	.209	999+	3.89	13.7	orange	Depth 10 ft. PR .25 gpm
08:40	3.75	8.86	7.05	.302	999+	2.39	16.9	orange	Depth 12 ft. PR .25 gpm
08:55	7.5	9.86	7.19	.461	999+	3.06	17.7	orange	Depth 14 ft. PR .25 gpm
09:10	11.25	10.02	7.13	.352	999+	3.15	18.1	orange	Depth 16 ft PR .25 gpm
09:25	15.0	9.97	7.11	.303	999+	3.51	18.2	orange	Depth 18 ft. PR .35 gpm
09:40	20.25	11.14	7.01	.255	1518	3.24	18.0	orange	Depth 18 ft. PR .35 gpm
09:55	25.5	11.22	6.99	.226	691	3.35	17.9	orange	Depth 20 ft. PR .35 gpm

TD − DTW = WC x 2'/4' well = One PV x 5 = Min PV + H20 to install well = Minimum H20 to remove

22.78 − 6.22 = 16.56 x .163 = 2.70 x 5 = 13.5 + 20 g = 33.5 g

Qc'd. by [illegible]
10-1-01

Parcel No.: CWM 185
Well ID: MW02
Date: 10-31-01

Lee FLippen

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
10:10	30.75	11.12	7.04	.211	999+	3.41	17.9	orange	Depth 20 ft. PR .35 gpm — reached TARGET P.V. —
10:25	36.0	12.08	7.01	.211	999+	3.55	17.6	orange	Depth 20 ft. PR .35 gpm
10:40	41.25	12.25	6.99	.202	801	4.23	17.6	orange	Depth 20 ft. PR .35 gpm
10:55	46.5	12.49	7.09	.178	999+	4.57	18.0	orange	Depth 20 ft. PR .35 gpm
11:10	51.75	12.75	7.26	.172	999+	4.94	18.2	orange	Depth 16 ft. PR .25 gpm
11:25	55.5	10.79	7.32	.171	999+	5.02	19.3	orange	Depth 16 ft. PR .15 gpm
11:40	57.75	10.06	7.40	.171	978	3.99	19.5	orange	Depth 16 ft. PR .15 gpm
11:55	60.0	9.57	7.35	.169	338	4.36	19.9	cloudy	Depth 16 ft. PR .15 gpm
12:10	62.25	8.92	7.48	.168	196	4.29	20.2	cloudy	Depth 16 ft. PR .15 gpm
12:25	64.5	8.22	7.42	.168	119	4.04	20.4	cloudy	Depth 16 ft. PR .15 gpm
12:40	66.75	8.75	7.36	.170	97	4.85	20.3	cloudy	Depth 16 ft PR .15 gpm
12:55	69.0	7.93	7.25	.171	82	4.79	20.2	cloudy	Depth 16 ft PR .15 gpm
13:10	71.25	7.88	7.34	.173	59	4.17	20.2	cloudy	Depth 16 ft. PR .15 gpm

Parcel No.: CWM 185
Well ID: MW02
Date: 10-31-01
Lee FLIPPEN

11-01-01 PID 0.0 BZ 0.0 DTW = 6.25 ft WC = 16.53

Time 24hr	71.25 Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
13:25	73.5	8.09	7.34	.173	142	4.29	20.3	cloudy	Depth 16 ft. PR .15 gpm
13:40	75.75	7.58	7.30	.174	102	4.01	20.6	cloudy	Depth 16 ft. PR .15 gpm
13:55	78.0	7.65	7.20	.175	123	3.67	20.1	cloudy	Depth 12 ft. PR .15 gpm
14:10	80.25	7.73	7.15	.173	95	4.05	19.6	cloudy	Depth 12 ft. PR .10 gpm
14:25	81.75	7.90	7.19	.172	75	4.08	20.1	cloudy	Depth 12 ft PR .10 gpm
14:40	83.25	8.22	7.17	.172	114	4.03	19.8	cloudy	Depth 10 ft PR .10 gpm
14:55	84.75	7.93	7.14	.171	127	4.13	20.0	cloudy	Depth 10 ft PR .10 gpm
15:10	86.25	7.89	7.24	.170	45	4.31	19.3	cloudy	Depth 10 ft. PR .10 gpm
15:25	87.75	7.94	7.15	.170	58	4.38	19.2	cloudy	-Stopped parameters For the Day - Raw water Dry - ~~[illegible]~~ 10-31-01
11-01-01 07:10	87.75	6.25	6.62	.216	999+	3.64	17.0	orange	Depth 14 ft PR .10 gpm
07:25	89.25	8.81	6.86	.192	603	2.86	17.3	orange	Depth 10 ft PR .10 gpm
07:40	90.75	8.78	7.17	.184	612	3.63	17.8	orange	Depth 10 ft. PR .10 gpm
07:55	92.25	8.33	7.25	.183	259	3.66	18.2	cloudy	Depth 10 ft. PR .10 gpm
08:10	93.75	8.53	7.35	.182	112	3.91	18.2	cloudy	-8hrs. Development Time- well Development Completed.

Took 1 l. Photo Sample ~~[illegible]~~ 11-01-01

D:\FTMC\DEVELOPMENTLOG.DOC
07/20/99

APPENDIX D

SURVEY DATA

Survey Data
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
CWM-184-MW01	1176371.46	674687.71	840.59	842.80
CWM-184-MW02	1176321.26	674285.24	827.08	829.17
CWM-184-MW03	1176526.15	674141.84	828.35	830.40
CWM-184-MW04	1176466.11	673981.59	821.95	824.20
CWM-184-MW05	1176332.99	674588.45	837.39	839.29
CWM-184-DEP01	1176880.27	674105.80	807.20	NA
CWM-185-MW01	1176139.01	674086.35	820.26	822.19
CWM-185-MW02	1176193.20	674018.53	819.14	821.24
CWM-185-GP01	1176125.40	674227.73	820*	NA
CWM-185-DEP01	1176022.24	674546.41	807.57	NA
CWM-185-DEP02	1175767.40	674638.06	806.07	NA
CWM-185-SW/SD02	1175948.56	673915.58	806.24	NA

* Estimated.
Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983 (NAD 1983).

Elevations referenced to the North American Vertical Datum of 1988 (NAVD1988).

ft amsl - Feet above mean sea level.
NA - Not applicable.

APPENDIX E

VARIANCE REPORTS

INTERNATIONAL TECHNOLOGY CORPORATION	**Variance No:** CWMPARCEL184\185NOVEMBER01.VR1
	Linked w/NC No: X
	Date of Issue: 11-19-01
	Page _1 of 1__
Project Name: **Fort McClellan – CK10 \ WAD 01**	Project Number: 796887.01020300

-Variance Report -

I.Description: (by the person identifying the change)

SITE-SPECIFIC FIELD SAMPLING PLAN, SITE-SPECIFIC SAFETY AND HEALTH PLAN, AND SITE-SPECIFIC UNEXPLODED ORDNANCE SAFETY PLAN ATTACHMENTS FOR CHEMICAL WARFARE MATERIAL SITES; TRAINING AREA T-31, PARCELS 184 AND 185

The Final Site-Specific Field Sampling Plan (FSSFSP) proposed the collection of surface water samples and sediment samples at sample locations CWM-184-SW\SD01, CWM-185-SW\SD01 and CWM-185-SW\SD03. The three surface water samples and three sediment samples were not collected. Depositional soil samples were collected at these locations.

Identified by: Greg Sylwester, Risk Assessment Specialist	Date: 11-19-01

II. Justification for Variance:

The FSSFSP proposed a surface water sample and sediment sample at sample locations CWM-184-SW\SD01, CWM-185-SW\SD01 and CWM-185-SW\SD03. Surface water and sediment were not present in the drainage ditch \ creek during sample collection. Several attempts were made to collect a surface water sample and sediment sample, but all attempts were unsuccessful. Therefore, depositional soil samples CWM-184-DEP01, CWM-185-DEP01 and CWM-185-DEP02 were collected at those locations to determine the presence or absence of contamination.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan, and Site-Specific Unexploded Ordnance Safety Chemical Warfare Material Sites – Agent ID Area (Parcel 509), Training Area T-6 (Naylor Field) (Parcel 183), Blacktop Training Area (Parcel 511), Fenced Yard in Blacktop Training Area (Parcel 512), Dog Training Area (Parcel 513), Dog Kennel Area (Parcel 516), Training Area T-5 (Parcel 182), Former Detection and Identification Area (Parcel 180), Old Burn Pit (Parcel 514), CBR Proficiency Area (Parcel 517) and Old Toxic Training Area (Parcel 188); October, 2000.

Distribution List:
1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Ellis Pope, US Army Corps of Engineers
6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager	11-27-2001 Date
Approved by: Stanley E. Parrott, USACE	11-29-01 Date
Project Manager Approval: Jeanne Yacoub	12/6/01 Date
QA Approval: Randy McBride	12-5-01 Date

INTERNATIONAL TECHNOLOGY CORPORATION

Variance No: CWMPARCEL184\185FEBRUARY02.VR1

Linked w/NC No: x

Date of Issue: 2-14-02

Page _1 of 1__

Project Name: **Fort McClellan** – CK10 \ WAD 01

Project Number: 796887.01020300

-Variance Report -

I.Description: (by the person identifying the change)

SITE-SPECIFIC FIELD SAMPLING PLAN, SITE-SPECIFIC SAFETY AND HEALTH PLAN, AND SITE-SPECIFIC UNEXPLODED ORDNANCE SAFETY PLAN ATTACHMENTS FOR CHEMICAL WARFARE MATERIAL SITES; TRAINING AREA T-31, PARCELS 184(7) AND 185(7)

The Final Site-Specific Field Sampling Plan (FSSFSP) proposed seven surface soil samples and seven subsurface soil samples at sample locations CWM-184-MW01, CWM-184-MW02, CWM-184-MW03, CWM-184-MW04, CWM-184-MW05, CWM-185-MW01 and CWM-185-MW02. These soil samples were proposed for the Site Investigation (SI) to determine the presence or absence of soil contamination. However, eight surface soil samples and eight subsurface soil samples were collected for chemical analysis.

Identified by: Jeffrey J. Tarr, PG – IT Site Manager

Date: 2-14-02

II. Justification for Variance:

The FSSFSP proposed seven surface soil samples and seven subsurface soil samples to determine the presence or absence of soil contamination. The IT Site Manager made a decision to collect one additional surface soil sample and subsurface soil sample at sample location CWM-185-GP01. These soil samples were collected next to a pit, measuring approximately 15 feet wide by 5 feet deep. One metal smoke pot and some metallic debris were present at the bottom of the pit. The soil samples were collected to better determine the presence or absence of soil contamination associated with chemical warfare training activities. These soil samples were not proposed in the FSSFSP. This variance will not alter the intent of the SI at Training Area T-31.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan, and Site-Specific Unexploded Ordnance Safety Chemical Warfare Material Sites – Agent ID Area (Parcel 509), Training Area T-6 (Naylor Field) (Parcel 183), Blacktop Training Area (Parcel 511), Fenced Yard in Blacktop Training Area (Parcel 512), Dog Training Area (Parcel 513), Dog Kennel Area (Parcel 516), Training Area T-5 (Parcel 182), Former Detection and Identification Area (Parcel 180), Old Burn Pit (Parcel 514), CBR Proficiency Area (Parcel 517) and Old Toxic Training Area (Parcel 188); October, 2000.

Distribution List:
1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Ellis Pope, US Army Corps of Engineers
6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager — Jeffrey J. Tarr — 2-14-2002 Date

Approved by: COE — Darryl A. Hatcher — 02/19/02 Date

Project Manager Approval: Jeanne Yacoub — 2/1/ Date

QA Approval: Randy McBride — Randall L. McBride — 2-25-02 Date